

TWELFTH REPORT  
OF THE  
DAIRYMEN'S ASSOCIATION

OF THE  
PROVINCE OF QUEBEC

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

1893

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*PRINTED BY ORDER OF THE LEGISLATURE*

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QUEBEC  
PRINTED BY CHARLES-FRANÇOIS LANGLOIS  
PRINTER TO HER MOST EXCELLENT MAJESTY THE QUEEN

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1894



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*To the Hon. Co.*

SIR,

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TWELFTH 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 1893, and of the Annual Meeting held at St. Hyacinthe 5th, 6th and 7th December last.

THE SECRETARY-TREASURER OF THE DAIRYMEN'S

ASSOCIATION OF THE PROVINCE OF QUEBEC,

EMILE CASTEL.

St. Hyacinthe, Jan. 2nd, 1894.

# OFFICERS AND DIRECTORS OF THE DAIRYMEN'S ASSOCIATION

FOR 1894,

Honorary President: THE HON. P. B. DE LABRUÈRE, St. Hyacinthe.  
 Honorary Vice-President: M. N. BERNATCHEZ, M. P. P., Montmagny.  
 President: L'ABBE T. MONTMINY, St. Georges de Beauce.  
 Vice-President: S. A. FISHER, Knowlton.  
 Secretary-Treasurer: EMILE CASTEL, St. Hyacinthe.

## DIRECTORS

DISTRICT	NAMES	RESIDENCE
Arthabaska.....	Messrs. T. C. CARTER .....	Kingsey-French-Village
Beauce.....	PHILIAS VEILLEUX .....	St. François-Beauce
Beauharnois .....	ROBERT NESS.....	Howick
Bedford .....	J. A. HAYES .....	Sheffington
Charlevoix .....	ED. A. BARNARD.....	Quebec
Chicoutimi and Saguenay.....	F. PARADIS .....	Bagotville
Iberville .....	M. MONAT .....	Mount Johnson
Joliette .....	I. J. A. MARSAN .....	L'Assomption
Kamouraska .....	J. C. CHAPAIS .....	St. Denis-en-bas
Montmagny .....	N. BERNATCHEZ.....	Montmagny
Montreal .....	ALEXIS CHICOINE.....	St. Marc
Quebec.....	L. P. BERNARD .....	Cap Santé
Richelieu.....	J. L. LEMIRE.....	La Baie du Febvre
Rimouski.....	J. DE L. TACHÉ.....	St. Hyacinthe
St. François .....	D. O. BOURBEAU .....	Victoriaville
St. Hyacinthe.....	L. T. BRODEUR.....	St. Hugues
Terrebonne.....	FRS. DION.....	Ste. Thérèse
Three-Rivers .....	L'ABBE GÉRIN .....	St. Justin

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# LEGISLATION

AUTHORISING THE FORMATION OF AN ASSOCIATION UNDER THE NAME OF "DAIRY  
ASSOCIATION OF THE PROVINCE OF QUEBEC."  
(1749 to 1755 Q. R. S. and Schedule)

**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, s. 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.

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" **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 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.

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, for the maintenance and working of the boards of examiners above mentioned.

**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-presi-

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dent, 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 deserves public notice, and giving all the information which they deem useful in the interest of the dairy industry. 45 v., c. 66, s. 8.

#### SCHEDULE

##### MENTIONED IN ARTICLE 1750.

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

NAMES.	\$	CTS.

## 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 follow :

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 ASSOCIATION.

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

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

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

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

" 1755d. Such declaration shall be made in duplicate, one to be written and signed on the first 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 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 appoint-

ment of its officers and property, for the

" 1755g. The district, on the notice of the for-

" 1755h. as shall have been

" 1755i. shall elect three the association in the said counties

" 1755j. and a vice-president and employés association.

" 1755k. association a detailed Such report amount subscribe number of the financial and in the

A triplicate of the Province of Quebec.

2. This act shall

We, the undersigned, in pursuance of the provisions of section 1 of the Statutes of the Province of Quebec, do hereby certify that the same have been duly assented to and published in the names, and we further certify that the same have been duly published in the names of the

ment 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 the 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 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.

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#### 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.

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R. S. Q., TITLE HI, 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 member 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.

**5479.** If established, sh that of choosir to the laws of and for conduc 45 V., c. 65, s.

**5480.** T within the eigh 5477, after a sp least two share days before the laws of the soci

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**5481.** A shares, and ano e. 65 s. 4.

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§ 2.—*General Powers and Duties.*

**5479.** Every such society so formed, for the purposes for which it as 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 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 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.

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:

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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 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 *primá 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 *primá facie* evidence on which to found a conviction to show that such milk so sent, sold, supplied or brought to a manufactory as aforesaid to be manufactured into butter, or cheese, or condensed milk, is substantially inferior in quality to pure milk, provided the test is made by means of a lactometer or cream gauge, or some other proper and adequate test, and is made by a competent person. Provided always that a conviction may be made or had on any other sufficient legal evidence.

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

9. No appeal shall lie from any conviction under this Act except to a Judge of a Superior, County, Circuit or District Court, or to the chairman or judge of the Court of the Sessions of the Peace, having jurisdiction where the conviction was had; and such appeal shall be brought, notice of appeal in writing given, 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.

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8. The president shall take the chair at the general meetings, and at the meetings of the board or 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 meeting of the board of directors: the call shall be in the form mentioned above.

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

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

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

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

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

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 Honorable 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.

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;

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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 inspectors:

## 1

## DIVISION OF THE PROVINCE.

The province shall be divided as follows, for the purpose 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, Levis, Beauce.
4.....	Lotbinière, Megantic, Arthabaska.
5.....	Nicolet, Yamaska.
6.....	Drummond, Richmond, Wolfe.
7.....	Sherbrooke, Stanstead, Compton.
8.....	St. Hyacinthe, Bagot, Richelieu.
9.....	Rouville, Iberville, St. John's.
10.....	Shefford, Brome, Missisquoi.
11.....	Vercheres, Chambly, Laprairie, Napierville.
12.....	Beauharnois, Chateauguay.
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 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.

1. A syndicate of fifteen, or more, factories in a division in which the number of factories is calculated to be less than the general average of syndicated factories, shall be proportionately increased in number, as well as the number of inspectors, to insure the best conditions hereof.

2. The syndicate shall be represented by a manufacturing

3. The syndicate shall be represented by a representative of the creameries, or the representative of the creameries, to a declaration of the syndicate, a duplicate of which shall be kept by the Inspector-general.

4. In each division, there shall be one or more creameries.

5. If in any division there are no creameries, the representative of the creameries shall be appointed by the neighbouring divisions.

6. Every syndicate shall be represented by its division.

7. Every syndicate shall be represented by its division, provided for by the regulations.

8. For each syndicate, the representative of the factories of a division shall be appointed, that this permission shall be granted to the syndicate.

9. The representative of the syndicate shall be appointed by the president, a vice

## III

## ORGANISATION AND WORKING OF THE SYNDICATES.

1. A syndicate shall be constituted by the associating together of creameries, cheese-factories, other dairy establishments, to the number of not fewer than (15) fifteen, or more than (30) thirty; it shall have for its aim the diffusion 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 Dairymen'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, 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 neighboring division, provided that this permission hinder not the formation of a syndicate in the former division.

9. The representative 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 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 do 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.

15. 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 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.

#### IV

##### 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; and association, at

2. Before or if he receive call together association, or them in their

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4. It is obli by the Inspecto

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 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, 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 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 visit so as to 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 hindrances, 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 patrons in regard to the proprietor the person in charge shall warn the Inspector-General or of the

15. The inspector shall be guarded in the discharge of his duty; a special certificate of

1. The board appointed by the

This board is to be passed a certificate of the examination of the other forms

3. To those of competence; well,—and it shall be good for only examination, either served subjects.

4. The board of the Commissioner of Agriculture, containing received the certificate

5. Even the directors of the breach of the rules charge his duties

6. If the number of examination in the distant candidates

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 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.

#### V.

#### 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.

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 satisfactory 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 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 examination 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.

## 56 VICTORIA, CHAP. 37, OTTAWA.

AN ACT TO PREVENT THE MANUFACTURE AND SALE OF FILLED OR IMITATION CHEESE,  
AND TO PROVIDE FOR THE BRANDING OF DAIRY PRODUCTS.

[Assented to 1st April, 1893.]

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

1. This Act may be cited as *The Dairy Products Act, 1893*.
2. No person shall manufacture, or shall knowingly buy, sell, offer, expose or have in his possession for sale, any cheese manufactured from or by the use of skimmed milk, to which there has been added any fat which is foreign to such milk.
2. Every person who, by himself or by any other person to his knowledge, violates the provisions of this section, shall, for each offence, upon conviction thereof before any justice or justices of the peace, be liable to a fine not exceeding five hundred dollars and not less than twenty-five dollars, together with the costs of prosecution, and in default of payment of such fine and costs shall be liable to imprisonment, with or without hard labour, for a term not exceeding six months, unless such fine and the costs of enforcing it are sooner paid.
3. No person shall sell, offer, expose, or have in his possession for sale, any cheese manufactured from or by the use of milk commonly known as "skimmed-milk," or milk from which cream has been removed, or milk to which skimmed milk has been added, unless the words "skim-milk cheese" are branded, marked or stamped in a legible manner upon the side of every cheese, and also upon the outside of every box or package which contains the same, in letters not less than three-quarters of an inch high and three-quarters of an inch wide.
2. No person, with intent to misrepresent or to defraud, shall remove, or in any way efface, obliterate or alter the words "skim milk cheese" on such cheese, or on any box or package which contains the same.
3. Every person who, by himself or by any other person to his knowledge, violates any of the provisions of this section, shall, for each offence, upon conviction thereof before any justice or justices of the peace, be liable to a fine not exceeding five dollars and not less than two dollars for every such cheese, or box or package which is sold, offered, exposed or had in his possession for sale, together with the costs of prosecution, and in default of payment of such fine and costs shall be liable to imprisonment, with or without hard labour, for a term not exceeding three months, unless such fine and the costs of enforcing it are sooner paid.

4. No person shall sell, offer, expose or have in his possession for sale, any butter which is sold, offered, exposed or had in his possession for sale, unless the words "Canadien" or "Canada" are stamped upon any box or package which contains the same, in letters not less than ten lines high, and the words "butter" are stamped upon any box or package which contains the same, in letters not less than ten lines high.

2. No person shall sell, offer, expose or have in his possession for sale, any cheese or butter which is sold, offered, exposed or had in his possession for sale, unless the words "Canada" are stamped upon any box or package which contains the same, in letters not less than ten lines high, and the words "cheese" or "butter" are stamped upon any box or package which contains the same, in letters not less than ten lines high.

3. Every person who, by himself or by any other person to his knowledge, violates any of the provisions of this section, shall, for each offence, upon conviction thereof before any justice or justices of the peace, be liable to a fine not exceeding twenty dollars and not less than five dollars, together with the costs of prosecution, and in default of payment of such fine and costs shall be liable to imprisonment, with or without hard labour, for a term not exceeding six months, unless such fine and the costs of enforcing it are sooner paid.

5. No person shall sell, offer, expose, or have in his possession for sale, any butter which is sold, offered, exposed or had in his possession for sale, unless the words "Canada" are stamped upon any box or package which contains the same, in letters not less than ten lines high, and the words "butter" are stamped upon any box or package which contains the same, in letters not less than ten lines high.

2. Every person who, by himself or by any other person to his knowledge, violates the provisions of this section, shall, for each offence, upon conviction thereof before any justice or justices of the peace, be liable to a fine not exceeding five dollars and not less than two dollars, together with the costs of prosecution, and in default of payment of such fine and costs shall be liable to imprisonment, with or without hard labour, for a term not exceeding three months, unless such fine and the costs of enforcing it are sooner paid.

6. The provisions of this section shall apply to any person who, by himself or by any other person to his knowledge, violates any of the provisions of this section, shall, for each offence, upon conviction thereof before any justice or justices of the peace, be liable to a fine not exceeding five dollars and not less than two dollars, together with the costs of prosecution, and in default of payment of such fine and costs shall be liable to imprisonment, with or without hard labour, for a term not exceeding three months, unless such fine and the costs of enforcing it are sooner paid.

7. In any case where a person is convicted of an offence under this Act, the court may, in addition to the punishment provided by this Act, order that the person be liable to pay the costs of the prosecution, and in default of payment of such costs shall be liable to imprisonment, with or without hard labour, for a term not exceeding three months, unless such costs and the costs of enforcing it are sooner paid.

8. No appeal shall lie from any conviction or sentence under this Act, except in the case of a conviction or sentence in any county, circuit or



4. No person shall apply any brand, stamp or mark of the word "Canadian," "Canadien" or "Canada" as a descriptive term, mark or brand upon any cheese or upon any box or package which contains cheese or butter, unless such cheese and butter have been produced in Canada.

2. No person shall knowingly sell, offer, expose or have in his possession for sale, any cheese or butter upon which or upon any box or package which contains the same, the words "Canadian," "Canadien" or "Canada" is applied as a descriptive term, mark or brand, unless such cheese and butter have been produced in Canada.

3. Every person who, by himself or by any other person to his knowledge, violates any of the provisions of this section, shall, for each offence, upon conviction thereof before any justice or justices of the peace, be liable to a fine not exceeding twenty dollars and not less than five dollars for every such cheese or box or package, which is sold, offered, exposed or had in his possession for sale, together with the costs of prosecution, and in default of payment of such fine and costs shall be liable to imprisonment, with or without hard labour, for a term not exceeding three months, unless such fine and the costs of enforcing it are sooner paid.

5. No person shall sell, offer, expose or have in his possession for sale, any cheese or butter which is produced in any foreign country, unless the name of the country where such cheese or butter was produced, is branded, stamped or marked in a legible manner upon the outside of every box or package which contains the same, in letters not less than three-eighths of an inch high and one-quarter of an inch wide.

2. Every person who, by himself or by any other person to his knowledge, violates the provisions of this section shall, for each offence, upon conviction thereof before any justice or justices of the peace, be liable to a fine not exceeding five dollars and not less than two dollars for every such cheese, or box or package of butter, which is sold, offered, exposed or had in his possession for sale, together with the costs of prosecution, and in default of payment of such fine and costs shall be liable to imprisonment, with or without hard labour, for a term not exceeding three months, unless such fine and the costs of enforcing it are sooner paid.

6. The person on whose behalf any cheese or butter is manufactured, sold, offered, exposed or had in possession for sale, contrary to the provisions of the foregoing sections of this Act, shall be *prima facie* liable for the violation of any of the provisions of this Act.

7. 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 cheese or butter complained of was manufactured, sold, offered, exposed or had in possession for sale.

8. No appeal shall lie from any conviction under this Act except to a superior, county, circuit or district court, or 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 such appeal 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 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.

9. It shall be lawful for any person who may be charged with the enforcement of this Act to enter upon the premises of any person suspected of violating the provisions of this Act, and make an examination of cheese or butter ; and any such suspected person, who obstructs or refuses to permit the making of any such examination, shall, upon conviction thereof, be liable to a penalty not exceeding five hundred dollars and not less than twenty-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 are sooner paid.

10. Any pecuniary penalty imposed under this Act, shall, when recovered, be payable, one half to the informant or complainant, and the other half to Her Majesty.

11. The Governor in Council may make such regulations as he considers necessary in order to secure the efficient operation of this Act ; and the regulations so made shall be in force from the date of their publication in the *Canada Gazette*, or from such other date as is specified in the proclamation in that behalf.

## LIST OF

## PARISH OR P. O.

AF  
 Avoca .....  
 Brownsburg.....  
 Carillon.....  
 Dalesville.....  
 ".....  
 Grenville.....  
 Harrington.....  
 Lachute.....

Mabel.....  
 St. Andrews (East)

St. Philippe.....  
 Stonefield.....

## ART

Arthabaskaville...

Blandford (St. Louis)  
 Ste Clothilde de Hor  
 Ste Hélène.....  
 St. Norbert.....

St. Patrick's Hill...

St. Paul de Chester  
 St. Remi de Tingwi  
 St. Valere de Bulstr

" Rivière Noi  
 Stanfold.....  
 Victoriaville.....

Walker's Cutting ...  
 Warwick.....

# LIST OF THE MEMBERS OF THE ASSOCIATION.

1893.

PARISH OR P. O.	NAME.
<b>ARGENTEUIL.</b>	
Avoca .....	T. Bonhomme
Brownsburg.....	E. Birdsell
Carillon.....	J. Baldwin.
Dalesville.....	Geo. A. Campbell.
" .....	F. Derbyshire.
Grenville.....	D. McGregor.
Harrington .....	L. Gibson.
Lachute.....	William Brown.
	J. O. Connor.
	A. Hess.
Mabel.....	Wm. Muir.
St. Andrews (East)....	W. J. Morrow.
	John Knox.
St. Philippe.....	A. Gormon.
Stonefield .....	A. Kahala.
<b>ARTHABASKA.</b>	
Arthabaskaville .....	J. B. Blais.
	J. O. Thibeault.
	David Dumont.
	Philius Bergeron.
	Dame Pellerin, widow.
	Maheu et Freres.
Blandford (St. Louis de).....	Rev. Chs. Ed. Mailhot.
St. Clothilde de Horton.....	Gédéon Houle.
St. Hélène.....	Léon Camiré.
St. Norbert.....	Germain St. Pierre.
	Jos. Ayotte.
	Alfred Ouellet.
	Napol. Tousignant.
St. Patrick's Hill.....	Zephyrin Genest.
	Philius Laroche.
St. Paul de Chester .....	Irénée Bergeron.
St. Remi de Tingwick.....	Ernest Poisson.
St. Valere de Bulstrode.....	Dolphus St. Laurent.
	Blanchette et St. Lau-
	rent.
	Bergeron et Trudel.
	George Blanchette.
" Rivière Noire.....	Leclerc et Freres.
Stanford.....	Calixte Dion.
Victoriaville .....	D. O. Bourbeau.
	J. E. Genest Labarre.
Walker's Cutting .....	Adolphe St. Laurent.
Warwick.....	Calixte Kirouac.
	Onésime Kirouac.
	Albert Lainesse.
	A. M. Méthot.
	David Guillemette.

PARISH OR P. O.	NAME.
<b>BAGOT.</b>	
Actonvale .....	M. McDonald, M.P.P.
St. Ephrem d'Upton.....	Delphis Chicoine.
	Lafontaine et Frère.
St. Dominique.....	Norbert Fredette.
	Louis Fredette.
	Harris Brabant.
	Domina Bernard.
	J.-Bte Lapalme.
Ste Hélène.....	Eusébe Dufault.
	Alexis Sylvestre.
	Antoine Sicard.
St. Hugues.....	L. T. Brodeur.
	E. Lafontaine.
	Narcisse Leclaire.
	Emile Lefebvre.
	Wil C. Simonneau.
	Louis Poulin.
	Joseph Gaumont.
St. Liboire.....	Jos. Lemonde.
	Lajoie et Fils.
St. Nazaire.....	Rev. J. L. Marcotelles.
St. Pie.....	Hector Lepalme.
	J. B. Racine.
	Jos. Blanchard.
Ste Rosalie.....	Jos. B. Grenier.
St. Simon.....	Denis Casaubon.
	Herménég. Robert.
	Ed. Laliberté.
St. Théodore d'Acton.....	Isidore Jodoin.
<b>BEAUCE.</b>	
East Broughton.....	Pierre Gagnon.
Jersey Mills.....	Louis Gendreau.
Lambton.....	Omer Lacombe.
	Octave Lemieux.
	T. B. Lavigne.
St. Evariste Forsythe.....	Omer Dallaire.
	Joseph Lachance.
St. Elzéar .....	A. Drouin.
St. Ephrem de Tring.....	Phil. Poulin.
	Octave Roy.
	Gédéon Roy.
St. Honoré de Shenley.....	Alfred Fortier.
	Thadée St. Pierre.
	Louis Fortier.
St. Côte de Kennebec.....	Zéphirin Langlois.
	Irénée Bélanger.
St. François.....	Joseph Bolduc.
	Jean Fortin.
	Charles Bolduc.

PARISH OR P. O.	NAME.
BEAUCE.—Continued.	
St. François, <i>Cont.</i> .....	Philius Veilleux. Charles S. Bosque. Gédéon Doyon. David Roy. Philippe Jolicœur. Joseph Bureau. Joseph Denis.
St. Frédéric.....	Joseph Gendron. Norbert Plante. Richard Giguère. George Lagueux. F. X. Plante. Elias Gilbert.
St. Georges.....	Rev. Th. Montminy. Elzéar Poulin. Pierre Veilleux. Adalbert Loubier. Joseph Thibodeau. Joseph Poulin. Paul Bourque. Philemon Poulin. Fulbert Garneau. Joseph Poirier.
St. Joseph.....	Joseph Taschereau. Thomas Doyon. Jos. Lambert. Vital Roy. Noel Roy. Ephrem Tardif.
Ste Marie.....	Ferdinand Pepin. Louis Faucher. Henri Havard.
St. Sébastien.....	Edouard Marceau.
St. Victor de Tring.....	J. G. Plante. Napoleon Mercier. Joseph Veilleux. Marcellin Rodrigue.

#### BEAUHARNOIS.

Beauharnois.....	André Leduc, Fils.
St. Etienne.....	Jérémie Brosseau.
St. Louis de Gonzague.....	H. Lepage. John Thompson. W. E. Gardner. W. Maithers.

#### BELLECHASSE.

St. Cajetan d'Armagh.....	Olivier Leclerc.
St. Charles.....	François Roy. Damase Blais. Onésime Mercier.
St. Lazare.....	Amédée Grégoire.
St. Michel.....	Médard Roy. Onésiphore Talbot. Alphonse Furoy.
St. Raphael Est.....	Philius Gonthier.

#### BERTHIER.

Berthier en haut.....	Louis Olivier.
St. Barthélémy.....	U. Lécuyer. Jos. Morand. Jos. Bacon.

PARISH OR P. O.	NAME.
BERTHIER.—Continued.	
St. Barthélémy, <i>Cont.</i> .....	Olivier Brunelle. Alfred Plante. J.-Bte Côte.
St. Cuthbert.....	Antoine Robert. Ulric Courchesne. Joachim Grégoire.
St. Damien de Brandon.....	Joseph Boucher. Euclide Boucher.
St. Gabriel ".....	George Dauphinais. Honoré Dubeau.
St. Michel des Saints.....	S. J. Alex. Ménard.
St. Norbert.....	Sullivan Denis.

#### BONAVENTURE.

#### BROME.

Adamsville.....	P. O. Domingue.
East Farnham.....	Wm. Thos. Wilkinson.
Fulford.....	Mason Woodward.
Knowlton.....	S. A. Fisher.
Sutton.....	A. W. Woodard.

#### CHAMBLY.

Chambly.....	Napoleon Raymond.
" Basin.....	P. A. Massé.
St. Bazile le Grand.....	Avila Trudeau, Fils.

#### CHAMPLAIN.

Batiscan.....	Joseph Laguerre. Charles M. Gouin. O. Lacourcière. L. P. Lacourcière. Pierre Lapointe.
Champlain.....	Jos. C. Félix.
N.-D. du Mont Carmel.....	Luc Ducharme. Thomas Lacerte.
Ste Anne Lapérade.....	Achillée Baribault. N. E. Clément. Hon. C. Gendron. J. A. Foley. Michel Loranger.
Ste Flore.....	Matteau et Laperrière. Ulric Leblanc. Hilaire Lupien.
Ste Geneviève Batiscan.....	Auguste Trudel. Jos. Massicotte. Ernest Jacob. Philippe Trudel. Walter Nobert.
St. Maurice.....	Isidore Derouin. F. X. Blondin. Ant. Laprise. Hubert Nobert.
St. Narcisse.....	Isidore Derouin. Trefflé Trudel. J. F. Cossette.
St. Prosper.....	J. N. Massé. Alfred Trudel. J. T. Trudel.

#### PARISH OR P. O. CHAM

St. Prosper, <i>Con</i> .....
St. Séverin.....
St. Stanislas.....
St. Tite.....

#### C

La Malbaie.....
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#### CH

Chateauguay.....
Howick.....

Ormstown.....
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Riverfield.....
Ste Martine.....

St. Philomène.....
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St. Urbain.....
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#### CI

Bagotville.....
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Chicoutimi.....
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N. D. de Laterrière.....
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St. Alexis.....
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St. Alphonse.....
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St. Anne.....
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St. Dominique.....
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NAME.

continued.

r Brunelle.  
Plante.  
Côté.  
e Robert.  
e Courchesne.  
m Grégoire.  
e Boucher.  
e Boucher.  
e Dauphinais.  
é Dubeau.  
lex. Ménard.  
in Denis.

RE.

omingue.  
hos. Wilkinson.  
Woodward.  
isher.  
Woodard.

on Raymond.  
lassé.  
rudeau, Fils.

I.

Laguerre.  
M. Gouin.  
urcière.  
acourcière.  
Lapointe.  
Félix.  
charme.  
Lacerte.  
Baribault.  
ément.  
Gendron.  
ley.  
Loranger.  
i et Laperrière.  
Leblanc.  
Lupien.  
Trudel.  
ssicotte.  
Jacob.  
Trudel.  
Nobert.  
Derouin.  
londin.  
prise.  
Nobert.  
Derouin.  
rudel.  
ssette.  
assé.  
rudel.  
udel.

PARISH OR P. O.

NAME.

## CHAMPLAIN.—Continued.

St. Prosper, *Cont.*..... F. X. O. Trudel.  
Désiré Coultier.  
St. Séverin..... T. Veillet.  
Narc. Bordeleau.  
Majorique Bordeleau.  
St. Stanislas..... Ovide Trudel.  
Trefflé Jacob.  
Jos. L. Jacob.  
St. Tite..... Léon Lahaie.  
Zotique Allaire.  
Augustin Allaire.  
Samuel Allaire.  
Philippe Moreau.  
Jacob et Paquin.  
Marchand et Massicotte.

## CHARLEVOIX.

La Malbaie..... Jules Bradet.  
Phillippe Dufour.

## CHATEAUGUAY.

Chateauguay..... N. R. Laberge.  
Howick..... Robert Ness.  
J. G. Majorrison.  
Ormsdown..... Thos. McGill.  
J. D. Currie.  
Riverfield..... John McGregor.  
Ste Martine..... Ed. McGowan.  
Joseph Poirier.  
Joseph Touchette.  
St. Philomène..... Delphis Lacoste.  
F. P. Laberge.  
J. B. Damour.  
St. Urbain..... J. H. Vadnais.

## CHICOUTIMI.

Bagotville..... Firmin Paradis.  
Wilfred Côté.  
Chicoutimi..... Dr. L. E. Beauchamp.  
Mérède Fortin.  
François Brassard.  
Jos. Maltais.  
D. Maltais.  
N. D. de Laterrière... Louis Aubin.  
Arthur Tremblay.  
St. Alexis..... E. Lavoie et Tremblay.  
Jules Gauthier.  
St. Alphonse..... Pierre Tremblay.  
Jos. Buteau.  
Jean Perron.  
Elie Tremblay.  
St. Anne..... Eugène Guay.  
Ls. Boucher.  
André Boucher.  
Xavier Savard.  
St. Dominique..... Ch. J. B. Fortin.  
Julius Bergeron.  
Jos. Brassard.  
Jean Girard.  
Xavier Gagnon.

PARISH OR P. O.

NAME.

## COMPTON.

East Clifton..... E. S. Lussier.  
Gould..... J. L. Painchaud.  
N. D. des Bois..... Almidor Dumoulin.  
Paquetteville..... George Lefebvre.  
Ludger Lazure.  
Ste Edwidge..... Aug. Gérin.  
Jos. R. Belisle.  
St. Malo d'Aukland... Joseph Roy.  
St. Romain..... Cyrille Bourque.  
Waterville..... Bonaventure Robert.

## DEUX MONTAGNES.

Oka (La Trappe)..... RR. PP. Trappistes.  
Emile Schmitt.  
Charles Colombier.  
St. Augustin..... Damase Bougrette.  
Auzias Duquette.  
St. Benoit..... Paul Gratton.  
Antoine Daoust.  
St. Eustache..... Wm. Cloutier.  
J. E. Binet.  
Zéphir Champagne.  
F. X. Lorraine.  
O. Paquette.  
St. Hermas..... B. Beauchamp, M.P.P.  
H. Pagé.  
St. Placide..... Alphonse Dubreuil.

## DORCHESTER.

Frampton..... John H. Couture.  
Ste Claire..... Georges Richard.  
J. Léo Cayouette.  
William Laflamme.  
St. Hénédine..... P. E. Rouleau.  
St. Isidore..... J. Ovide Turgeon.  
Achille Chabot.  
Phillibert Pomerleau.  
Joseph Dumas.  
St. Justine..... Onés. Ferland.  
St. Léon de Standon... Emile Blanchette.  
Ste Marguerite..... David Cloutier.  
St. Odilon..... Noël Poulin.  
Rd. M. Guy.

## DRUMMOND.

Drummondville... Conrad J. Caron.  
J. P. Roberge.  
Arthur Bérard.  
Eloi Dionne.  
Benoit Lafond.  
Samuel Johns.  
Kingsey French Vill'ge J. P. Lefebvre.  
Alexis Gouin.  
T. C. Cartier.  
Aimé Thibodeau.  
Geo. Benoit.  
" Falls..... Pierre Kirouac.  
Denis Richard.  
" (St. Felix)... Paul Bergeron.  
L. Avenir..... Hylas Duguay.  
Ephrem Charpentier.  
Azarias Rhuel.



PARISH OR P. O.	NAME.
<b>DRUMMOND.—Continued.</b>	
L'Avenir.—Cont....	Jos. Duguay. Hylas Larivière.
St. Cyrille de Wendover	Ludger Jobin. Napoléon Raymond. Gaspard Côté. Paul Valois.
St. Eugène de Granth'm	Gédéon Nicholas.
St. Germain de "	Thomas Delaney. Olivier Lemaire. Louis Fontaine. Michel Gauthier. Jos. Duquette.
St. Guillaume d'Upton	J. B. Vigneau. A. Lanoix. Athan. Boucher. Moïse Héroux.
South Durham.....	Rd. Isid. Béland. Chas. Asselin. Fulgence Préfontaine. Ulféric Mongeon.
Ulverton .....	Edouard Gagnier.
Wickham Ouest. ....	Euchariste Lafrance.
<b>GASPÉ.</b>	
Grande Rivière.....	Rd. T. C. Duret.
<b>HOCHELAGA.</b>	
Hochelaga .....	W. H. Trenholme.
Mile End.....	Rd. Fr. Charest.
Rivière des Prairies...	Octave Allard. Delvica Adam.
Sault au Récollet.....	Anthime Pepin.
<b>HUNTINGDON.</b>	
Athelstan .....	Donald McLaren.
Cazaville .....	S. J. Law.
Dewittville.....	A. B. McDonald.
Dundee .....	A. Cooper. P. H. McIntosh.
" Ste Agnès.....	W. R. Tannahill.
Elgin .....	John McQuinn.
Frontier.....	W. H. Stewart.
Helena .....	A. W. Hart.
Herdman .....	G. E. Martin.
Huntingdon .....	Peter McFarlane. Geo. W. Ferguson. R. S. Feeney. W. H. Walker. A. M. Ferguson. Fred. Tweedie. John Law. A. Winters.
Kensington .....	J. H. Hall.
Killain .....	Joseph Simes.
La Guerre .....	John Finn. W. J. Barker.
Powerscourt.....	J. A. Plamondon.
Trout River .....	Fred. Sills.
<b>IBERVILLE.</b>	
Henryville .....	Léon Bénard.

PARISH OR P. O.	NAME.
<b>IBERVILLE.—Continued.</b>	
Henryville.—Cbt....	Elie Dagesse. Jos. Gamache. Hern. Blanchette.
Mount Johnson .....	Rd. L. L. Boivin. Thos. Barrière Fils. Michel Monat. S. Montplaisir. Jos. G. Moquin. Dos. Choquette. Jules Ménard.
St. Jean.....	A. Labrecque. Narcisse Brault, Fils.
St. Athanase.....	Amédée Davignon.
Ste Brigide.....	Osius Archambault.
Ste Sabine.....	Ephrem Bouchard. Marcel Bonneau.
St. Sébastien .....	Pierre Brault, Fils.
Sabrevois.....	S. J. Roy.
<b>JACQUES CARTIER.</b>	
Ste Geneviève .....	Urgel Lauzon. Edouard Legault.
St. Laurent.....	A. J. Coughtry.
<b>JOLIETTE.</b>	
St. Alphonse .....	George Trudeau.
Ste Beatrice.....	Onésime Boucher. Pierre Rondeau. Alfred Laporte.
Ste Elizabeth.....	Wilfrid Gingras. R. H. Beaulieu.
Ste Emmélie de l'Energie.....	Joseph Desroches. Jérémie Boucher. Joseph Coutu. Moïse Beaulieu.
St. Felix de Valois.....	Jean Ls. Coutu.
St. Jean de Matha.....	Joseph Gravel. Adolphe Beaudry. Moïse Roy. J. Rosario Gervais. Jos. Brault. Adolphe Ratel. Léon Bonin. Louis Marcil. Louis Robitaille. Anselme Asselin. George Clermont.
St. Thomas de Joliette.	M. Coutu. Ferdinand Hébert.
<b>KAMOURASKA.</b>	
Kamouraska .....	Cyrias Ouellette.
Rivière Ouëlle.....	J. A. Pelletier.
Ste. Anne Lapocatière.	Rev. L. O. Tremblay. " D. Pelletier. Philius Boucher. Démétrius Lévesque. Frs. Gendron, fils. Arthur Schmouth. J. C. Chapais. Charles Bouchard.

PARISH OR P.	KAMO
St. Denis en bas	
St. Paschal....	
Chambord.....	
Hebertville.....	
St. Félicien.....	
S. Lin.....	
St. Charles.....	
L'Assomption....	
Laurentides.....	
L'Épiphanie.....	
Repentigny.....	
St. Paul l'Hermit	
St. Roch l'Achiga	
St. Sulpice.....	
St. François de Sa	
St. Martin.....	
St. Vincent de Pa	
St. Romuald.....	
St. David.....	
St. Henri.....	
St. Nicholas.....	
L'Islet.....	
St. Eugène.....	
St. Jean Port Joli	
St. Louise.....	
St. Roch des Aulna	

NAME.	PARISH OR P. O.	NAME.
<b>KAMOURASKA.—Continued.</b>		
	St. Denis en bas.—	Cont. Frs. Gagnon.
	St. Paschal.....	Aug. Desjardins. J. A. Blais.
<b>LAC ST. JEAN.</b>		
	Chambord.....	Oct. Lefrançois.
	Hebertville.....	J. Elisée Hudon. P. E. Hudon.
	St. Félicien.....	David Girard.
<b>LAPRAIRIE.</b>		
<b>L'ASSOMPTION.</b>		
	S. Lin.....	E. Desmarais. J. D. Archambault.
	St. Charles.....	François Allard.
	L'Assomption.....	I. J. A. Marsan. Alfred Longpré. Joseph Parthenais.
	Laurentides.....	Horace H. Ethier.
	L'Épiphanie.....	Aimé Lord.
	Repentigny.....	Jos. N. Thounin.
	St. Paul l'Hermite.....	Samuel Chagnon.
	St. Roch l'Achigan.....	Méderie St. André. Ernest Gariépy. Jos. Deslongchamps. J. J. Gareau.
	St. Sulpice.....	Chicoine et Giguère.
<b>LAVAL.</b>		
	St. François de Salles.....	Bruno Dazé. J. G. Héroux. Joseph Tremblay.
	St. Martin.....	Euclide Côté.
	St. Vincent de Paul.....	J. L. Allard. C. E. Paré. Ludger Menard.
<b>LEVIS.</b>		
	St. Romuald.....	George St. Hilaire.
	St. David.....	H. Fontaine.
	St. Henri.....	Alex. Paradis.
	St. Nicholas.....	Gabriel Desrochers. J. Bte. Caonette.
<b>L'ISLET.</b>		
	L'Islet.....	Napoléon Rouleau. Gustave Guilmette. Carbonneau et Leclerc.
	St. Eugène.....	Rev. Ad. Michaud.
	St. Jean Port Joli.....	Edouard Vaillancourt.
	St. Louise.....	Arthur Pelletier.
	St. Roch des Aulnais.....	Jos. Emile Pelletier. M. Aug. Pelletier.

NAME.	PARISH OR P. O.	NAME.
<b>LOTBINIERE.</b>		
	Lotbinière.....	Léger et Pépin. Joseph Beaudet. Urbain Hamel. Ulric Lemay. Arthur Beaudet.
	Methot's Mills.....	Alphonse Desrochers.
	St. Agapit.....	J. N. Allard. Notaire A. Tremblay.
	Ste Agathe.....	Rigabert Hallé.
	St. Antoine de Tilly.....	Philémon Dionne. J. Alphonse Charland. Guillaume Laroche. Napol. Garneau. Alphonse Bergeron.
	St. Croix.....	Hippolyte Lord.
	St. Edouard.....	Polycarpe Soucy. Alexandre Daigle.
	St. Flavien.....	Saül Côté. D. U. Bernard. Aimé Dumaine. Lazare Bédard.
	St. Jean des Chaillons.....	A. A. Mailhot. Evariste Lauzé. L. P. Bourret. A. A. Paris.
	St. Gilles.....	Rev. S. Garon.
<b>MASKINONGÉ.</b>		
	Louiseville.....	François Dionne. Henri Gélinas. A. Milot.
	Maskinongé.....	A. Dauplaise. Antoine Saucier.
	St. Alexis des Monts.....	Louis Geo. Caron. Patrick Bellerose. Bellerose et Perrault. Pierre Boucher.
	St. Didace.....	W. Perrault. Alfred Morin. Joseph Jolette. Philippe Lanoix.
	St. Justin.....	Rev. D. Gérin. Pierre Baril. Ed. Philibert. Salomon Philibert. Adolphe Ladouceur. Jos. Clément. Pierre Bussiède.
	St. Léon.....	Samuel Lefrançois. Ephrem Bergeron. Ls. Alph. Paquin. Roy, Boisvert et Caron. Roy et Caron. L. Milot. Paul Boisvert. Geo. Caron. Léonard Milot.
	St. Paulin.....	Samuel Boucher.
	St. Ursule.....	Geo. Boland. Alph. Grenier. H. Lambert. David Bélanger.

Continued.

Dagesse.  
Gamache.  
m. Blanchette.  
L. L. Boivin.  
s. Barrière Fils.  
el Monat.  
ontplaisir.  
G. Moquin.  
Choquette.  
s Ménard.  
abrecque.  
isse Brault, Fils.  
ée Davignon.  
s Archambault.  
em Bouchard.  
el Bonneau.  
re Brault, Fils.  
Roy.

RTIER.

d Lauzon.  
ard Legault.  
Coughtry.

E.

ze Trudeau.  
ime Boucher.  
e Rondeau.  
d Laporte.  
id Gingras.  
Beaulieu.

h Desroches.  
ie Boucher.  
h Coutu.  
Beaulieu.  
Ls. Coutu.  
h Gravel.  
he Beaudry.  
Roy.  
sario Gervais.  
brault.  
he Ratel.  
Bonin.  
Marcil.  
Robitaille.  
me Asselin.  
e Clermont.  
utu.  
and Hébert.

KA.

ouellette.  
Pelletier.  
s. O. Tremblay.  
Pelletier.  
s Boucher.  
rius Lévesque.  
ndron, fils.  
r Schmouth.  
hapais.  
s Bouchard.

PARISH OR P. O.	NAME.
<b>MATANE.</b>	
Matane.....	Harrison et Truchon.
Petite Matane.....	Stanislas Thibault.
<b>MEGANTIC.</b>	
Leeds.....	Mich. P. Clancy.
Plessisville.....	Adam Sévigny.
	P. O. Drouin.
Richardville.....	J. Adélar Caron.
	L. A. Caron.
Robertson Station.....	Ferdinand D. Turgeon.
St. Ferdin'd d'Halifax.....	Louis Gilbert.
	Ls. Isr. Fréchette.
	Wilfrid Gilbert.
	Oscar Gilbert.
	L. N. Beaudoin.
	Lavertue et Cyr.
	Johnny Cyr.
	Adolphe Simonneau.
Sacré Cœur de Marie.....	J. O. Hébert.
Somerset.....	Alphonse Lord.
	Alfred Jutras.
	F. T. Savoie.
	Geo. Simonneau.
<b>MISSISQUOI.</b>	
Berenger.....	Napol. Girard.
Farnham.....	Ed. Arpin.
	Adélar Riel.
N. D. de Stanbridge.....	Aldéric Lanoue.
Stanbridge Station.....	Joseph Campbell.
<b>MONTCALM.</b>	
Rawdon.....	Charles J. Lane.
St. Alexis.....	Ernest Liard.
St. Esprit.....	Raymond Lesage.
St. Jacques l'Achigan.....	J. H. Lesage.
	J. N. Marion.
St. Liguori.....	Jos. Gaudet.
Ste Marie Salomé.....	J. Ernest Gaudet.
<b>MONTMAGNY.</b>	
Cap St. Ignace.....	Jos. Eloi Jalbert.
	Samuel Dugal.
	Eugène Metivier.
	Philippe Bernier.
	Louis Gagné.
	Zéphirin Boulet.
	Charles Boulet.
Isle aux Grues.....	Chas. E. Roy.
	Georges Roy.
	A. Jos. Roy.
	Jos. Alf. Vézina.
	Narcisse Lachaine.
Montmagny.....	S. Emile Côté.
	Cléophas Bélanger.
	Fortunat Côté.
	G. A. Bergeron.
St. Pierre, Riv. du Sud.....	Max Moreau.

PARISH OR P. O.	NAME.
<b>MONTMORENCY.</b>	
Château Richer.....	Télesphore Rhéaume.
Ste Anne de Beaupré.....	Emile Morel.
	Elzéar Fortier.
	Cyrius Marquis.
St. Féréal.....	Ed. Gariépy, J. P.
St. François I. O.....	Narcisse Roberge.
St. Joachim.....	Isidore L'heureux.
	Célestin Fortin.
	David Fortin.
	Hugh Brown.
	Antoine Thomassin.
	Jos. Pépin.
<b>MONTREAL.</b>	
<b>MONTREAL CITY.</b>	
122 Mount Royal.....	J. F. X. Mercier.
11 Torrance.....	Chs. Libercent.
St. Paul.....	Chs. Langlois.
Marché Ste Anne.....	J. A. Vaillancourt.
McGill.....	John H. Scott.
<b>MONTREAL CITY.</b>	
83 McGill.....	A. L. Calderhead.
33 St. Peter.....	Frank Wilson.
321 Commissioners.....	Jos. Ward & Co.
151 Sanguinet.....	Tim. Label.
McGill.....	A. A. Ayer.
208 McCord.....	B. Laniel.
14 St. Luke.....	W. Wilson.
St. Henry, (St. Antoine).....	J. A. MacDonald.
<b>NAPIERVILLE.</b>	
Napierville.....	Euphémien Faucher.
	Rd. A. P. Tassé.
St. Rémi.....	Chs. Huguet Latour.
<b>NICOLET.</b>	
Bécancour.....	Joseph Rochefort.
	Achille Carignan.
Gentilly.....	Eusèbe Houid.
" Revière.....	H. C. Fontaine.
Nicolet.....	Napol Desfossés.
	Rev. M. G. Proulx.
	Moïse Proulx.
	Evariste Marchand.
	Albert Courchesne.
Ste Angèle de Laval.....	M. Cormier, Fils.
Ste Brigitte des Saults.....	Joseph Lemire.
St. Célestin.....	Cyrille Vigneault.
	Grégoire Hébert.
	Moïse Girard.
	Cyr. Vigneault.
	Léger Leblanc.
	Philomond Duguay.
Ste Clothilde de Hort'n.....	Geo. Benoit.
St. Grégoire.....	Aurélien Bergeron.
	Luc Forest.
	Luc Thibaudeau.
	Hubert Dufresne.

PARISH OR P. O.	NAME.
<b>NIC.</b>	
St. Léonard d'Ardenne.....	
St. Monique.....	
<b>" Gd. St.</b>	
St. Perpétue.....	
St. Sophie de L'Assommoir.....	
St. Sylvère.....	
Maniwaki.....	
Montebello.....	
Montpellier.....	
Nominingue.....	
Papineauville.....	
St. Amédée.....	
St. André Avellan.....	
Thurso.....	
Elmside.....	
Cap Santé.....	
Grondines.....	
La Chevrotière.....	
Pointe aux Tremblants.....	
Poiré, P. O.....	
Pont Rouge.....	
St. Alban.....	

NAME.  
ENCY.

sphore Rhéaume.  
e Morel.  
r Fortier.  
s Marquis.  
ariépy, J. P.  
isse Roberge.  
re L'heureux.  
stin Fortin.  
d Fortin.  
h Brown.  
ine Thomassin.  
Pépin.

## AL.

X. Mercier.  
Libercent.  
Langlois.  
Vaillancourt.  
H. Scott.

## ITY.

Calderhead.  
k Wilson.  
Ward & Co.  
Lebel.  
Ayer.  
miel.  
Wilson.  
MacDonald.

## LE.

émien Faucher.  
v. P. Tassé.  
Huguet Latour.

## .

h Rochefort.  
le Carignan.  
be Hould.  
Fontaine.  
l Desfossés.  
M. G. Proulx.  
Proulx.  
iste Marchand.  
t Courchesne.  
rmier, Fils.  
h Lemire.  
le Vigneault.  
ire Hébert.  
Girard.  
Vigneault.  
r Leblanc.  
mond Duguay.  
Benoit.  
us Bergeron.  
forest.  
hibaudeau.  
rt Dufresne.

## PARISH OR P. O.

## NAME.

## NICOLET.—Continued.

St. Léonard d'Aston... Olivier Hébert.  
Drummond Camirand.  
Ste Monique..... Chs. Milot.  
B. A. Pothier.  
J. B. Beauchemin.  
Arth. E. Desautels.  
J. B. Duval.  
Napol Raymond.  
Victor Milot.  
Ernest Cloutier.  
Evariste St-Germain.  
" Gd. St. Esprit Johnny Terrien.  
Ste Perpétue..... Ernest Beauchemin.  
Luc Girard.  
Ste Sophie de Levrard. Damase Dubuc.  
St. Sylvère..... A. Clément.

## OTTAWA.

Maniwaki..... Rev. P. A. Laniel.  
Montebello..... Hurcher Huneault.  
Chas. S. Bennet.  
Montpellier..... L. Montpellier.  
Nominigüe..... R. P. Dunoyer.  
Papineauville..... Nap. Bricault.  
St. Amédée..... John Murray.  
St. André Avellin..... J. E. D. Gareau.  
Emile Belle Isle.  
Louis Quesnel.  
J. E. Major.  
Thos. Labrosse.  
Thurso..... Louis Sauvé.

## PONTIAC.

Elmside..... A. W. McKechnie.

## PORTNEUF.

Cap Santé..... George Frénette.  
W. Vézina.  
J. M. Bernard.  
L. P. Bernard.  
Chas. Falardeau.  
Alfred Després.  
Ulric Leclerc.  
Gaudias Hardy.  
Lucien Doré.  
Gabriel Hamel.  
Felix J. Leclerc.  
Grondines..... L. Archambault.  
Emile Hamelin.  
La Chevrotière..... Gédéon Laganière.  
Alfred Nault.  
Pointe aux Trembles. Joseph Angers.  
Alfred Clermont.  
Bernard Garneau.  
B. Rochette, Fils.  
Louis Robitaille.  
Poiré, P. O..... Aubert Bédard.  
Pont Rouge..... Jos. A. Bussiére.  
Ambroise Bussiére.  
St. Alban..... John Savard.  
Hubert Perron.  
S. U. Petit.

## PARISH OR P. O.

## NAME.

## PORTNEUF.—Continued.

St. Augustin..... Eleusippe Moisan.  
Phydimé Rochette.  
Felix East.  
St. Basile..... Joseph Derome.  
Charles Bédard.  
Alfred Laberge.  
Eugène Perron.  
Adelard Derome.  
St. Casimir..... Majorique Lebœuf.  
Eugène Rivard.  
Daniel Foley.  
Roch. Massicotte.  
Tessier et Rivard.  
St. Raymond..... Rev. Edm. Poirier.  
Edouard Matte.  
Louis Lesage.  
St. Ubalde..... Maxime Hardy.  
Charles Hardy.

## QUEBEC.

## QUEBEC CITY.

Des Jardins..... Dr. J. A. Couture.  
Parlement..... Ed. A. Barnard.  
"..... O. E. Dallaire.  
Séminaire..... Rev. F. C. Gagnon.  
Sault-au-Matlot..... Côté et Roë.  
St. Louis..... Edgard Bélanger.  
P. O. B. 1040..... James Géggie.  
111 St. Pierre..... L. Jos. Belleau.

## QUEBEC COUNTY.

La Canardière..... Honoré Lortie.  
Pte Rivière..... Ambroise Jobin.  
Beauport..... Pierre Lortie.  
Charlesbourg..... H. A. Jos. Giroux.  
" Ouest..... P. T. Légare.

## RICHELIEU.

St. Aimé..... Olivier Levasseur.  
Siffroy Sylvestre.  
Hebert et St. Germain.  
Louis Lalancette.  
St. Louis de Bonsecours. Exurie Laramée.  
Ant. St. Martin.  
St. Ours..... Francois Robillard.  
Amétee Bonnier.  
Ovila Bonin.  
Edouard Durocher.  
Adelard Gaudette.  
A. Larivière & Cie.  
St. Robert..... Jos. Louis A. Rousseau.  
Napoléon Lamoureux.  
Paquin Dufault.  
N. et L. Parenteau.  
St. Roch..... Alexis Collet.  
Ste Victoire..... Hercule Paul Hus.  
Ad. Paul Hus.  
Sorel..... A. D. de Grandpré.  
H. Brosseau.





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PARISH OR P. O.

NAMES.

SHEFFORD.—*Continued.*

South Granby..... James Duncan.  
" Roxton..... Mrs. U. Reynolds.  
Stukely (Ste Anne de)..... Alma H. Petit.  
" South..... David Daignault.  
" South..... W. S. Purdy.  
Valcourt Ely..... Joseph Veroneau.  
"..... Hippolyte Bombardier.  
Waterloo..... Robert Boa.  
"..... Gédéon Boulé.  
Warden..... J. A. Lewis.  
"..... Chs. E. Standish.  
"..... H. J. Allan.  
"..... Arthur Bourdeau.

## SHERBROOKE.

Sherbrooke..... R. J. Sorel.

## SOULANGES.

Coteau Station..... L. A. Sauvé.  
Pontchateau..... J. A. Bourbonnais.  
"..... Louis Methot.  
Rivière Beaudette..... François Methot.  
St. Clet..... J. Bte Marleau.  
Les Cèdres..... Samuel Leroux.  
St. Polycarpe..... J. H. Leclair.  
"..... J. H. Gareau.  
St. Telesphore..... Ls Chenier.

## STANSTEAD.

Coaticook..... James Mullins, jr.,  
"..... Edouard Morais.  
Magog..... Jos. N. Gaudreau.

## TEMISCOUATA.

L'Isle Verte..... Chas. Préfontaine.  
"..... J. Jules Bélanger.  
Trois Pistoles..... J. O. Massé.  
St. Arsène..... Jos. Chouinard.  
St. Clement..... George April.  
St. Eloi..... C. Godbout.  
"..... Ludger Rivard.  
St. Epiphane..... Aug. Breton.  
St. Jean de Dieu..... J. B. Massé.

## TERREBONNE.

New Glasgow..... L. J. A. Lambert.  
Piedmont St. Sauveur..... A. W. Kimpton.  
"..... Edm. Brosseau.  
Ste Adèle..... Edmond Longpré.  
Ste Agathe..... Mde. Herreboudt.  
Ste Anne des Plaines..... Théodule Corbeille.  
"..... Philias Désormiers.  
St. Jovite..... Wilfrid Desjardins.  
St. Jérôme..... Pierre Coursol, fils.  
"..... Louis Labelle.  
"..... Israël Dion.  
Ste Marguerite..... Rev. A. G. Moreau.

PARISH OR P. O.

NAME.

TERREBONNE.—*Continued.*

S. Thérèse de Blainville " J. O. Labonté.  
" J. O. Nantel.  
" A. E. Garth.  
" Frs. Dion.  
" Toussaint Dion.  
" J. B. Waddell.  
" Ephrem Girard.  
" Alfred Caron.  
" Chs. D. Tylee.  
" Alfred Charbonneau.  
" Cleophas Desjardins.  
" Lévi Desjardins.  
" Antoine Desjardins.  
" R. F. directeur de l'Ecole  
" D. Labonté.  
" Hubert Gratton.  
" J. D. Leclair.  
" Jos. Gratton.

## THREE RIVERS.

Three Rivers, Town... Rd. M. Caisse.  
" township. Hormidas Duval.

## VAUDREUIL.

Isle Perrot Sud..... Atchie Leduc.  
Ste Marthe..... Peter Monahan.  
St. Rédempteur..... Geo. Valois.  
Vaudreuil..... Paul Denis.  
" A. Besner.  
" Amédée Castonguay.

## VERCHERES.

Belœil..... C. Choquette.  
" Félix Blain.  
Contrecœur..... Honoré Hanfield.  
St. Antoine..... Elie Gaudet.  
St. Julie..... Elie des Trois Maisons.  
St. Marc..... Dr. Leroux.  
" Alexis Chicoine.  
Ste Theodosie..... Bruno Larose.

## WOLFE.

Belmina..... Gus. Martel.  
D'Israeli..... S. E. Adam.  
Ham Nord..... Philippe Garneau.  
Lac Aylmer..... J. B. Delisle.  
St. Fortunat..... Thos Binette.  
" Frs. Beaudoin.  
St. Camille de Wotton..... Casimir Godbout.  
St. Gabriel de Stratford..... Et. Picard.  
" Gédéon Héon.  
S. Hippolyte de Wotton..... Rosario Bellisle.  
Weedon..... Alphée Fontaine.  
" Joseph Fontaine.  
" François Bourgeois.  
Wolfstown..... Rev. P. Côté.  
" Frs. Fradette.  
" O. Couture.  
" Ls. Boulanger.  
" Frs. Lacroix.

PARISH OR P. O.	NAME.
WOLFE.—Continued.	
Wolfstown.....	Ferd. Barron. J. B. Gouin. J. B. Henri. Edouard Gouin. Pierre Terrien. Nap. Monfette. Romain Boulanger. Joseph Bergeron. Charles Goulet. Onésime Cyr. Damase Roberge. Louis Gagnon.

YAMASKA.	
Abenakis Spring.....	J. N. Duguay.
Châtillon.....	Ovide Lepine.
La Baie du Febvre.....	J. T. Bellisle. J. Louis Lemire. J. A. Bellisle. Calixte Allard. Herman Lefebvre. Elie Proulx. J. Bte Lemire. Chs. Drouin. Uldéric Lévesque. Geo. Lafond. J. B. Martel. Elie Boivin. P. A. Robillard. Théod. Proulx. Elizée Parent. Ida Niquette. Ally Armand.
Pierreville, (St. Thos.).....	David Larivière. Fabien Vanasse. Chs. Cyr. David Joyal. Napol. Richard.
St. David.....	William Parent. Dominique Verville.
St. Elphège.....	

PARISH OR P. O.	NAME.
YAMASKA.—Continued.	
	A. Hamel. Siméon Paquette. Nestor Parent. St. François du Lac... Théogène Lépine. St. Pie Deguire..... Edmond Dauplais. Alexis Yergeau. St. Zéphyrin..... Evariste Boisvert. Cyprien Jutras. Edmond Lahaie. Herman Lefebvre. Toussaint Roy. D. J. Parent. Edouard Smith. Alexandre Simonneau. E. Caya.
Yamaska.....	Narcisse Parenteau.

ONTARIO.	
Ottawa.....	Léon Gérin.
Hawkesbury.....	John W. Ross.
Belleville.....	W. J. Denton.
Clarence.....	Elmer Tucker.
Glen Sanfield.....	Joseph Blais.
St. Thomas d'Alfred.....	Joseph Meloche.
The Lake.....	Simon Ouellet.
Monkton.....	A. Chalmers.
Williscroft.....	Jos. S. Isard.
Millars Corner.....	E. H. Graham.

MANITOBA.	
Ste.-Agathe.....	Alexis Toupin.
UNITED STATES.	
Fort Covington, N. Y.....	A. L. Lloyd.
Clarendon Pa.....	Adelard Couture.
FRANCE.	
St. Briec.....	L'abbé Aignel.
Lisieux.....	Edmond Groutl.
Ouilly le Vicomte.....	C. Morice.

### RECAPITULATION AND TOTALS BY COUNTIES.

Argenteuil.....	15	Joliette.....	24	Richelieu.....	21
Arthabaska.....	31	Kamouraska.....	13	Richmond.....	16
Bagot.....	28	Lake St. Jean.....	4	Rimouski.....	5
Beauce.....	56	Laprairie.....	0	Rouville.....	14
Beauharnois.....	6	L'Assomption.....	15	St. Hyacinthe.....	39
Bellechasse.....	9	Laval.....	7	St. Johns.....	3
Berthier.....	16	Levis.....	5	St. Maurice.....	11
Bonaventure.....	0	L'Islet.....	8	Shefford.....	36
Brome.....	5	Lotbinière.....	26	Sherbrooke.....	1
Chambly.....	3	Maskinongé.....	34	Soulanges.....	9
Champlain.....	46	Matane.....	2	Stanstead.....	3
Charlevoix.....	2	Megantic.....	19	Temiscouata.....	9
Chateauguay.....	13	Missisquoi.....	5	Terrebonne.....	30
Chicoutimi.....	24	Montcalm.....	7	Three-Rivers.....	2
Compton.....	10	Montmagny.....	17	Vaudreuil.....	6
Two-Mountains.....	15	Montmorency.....	12	Verchères.....	8
Dorchester.....	14	Montreal.....	13	Wolfe.....	30
Drummond.....	39	Napierville.....	3	Yamaska.....	42
Gaspe.....	1	Nicolet.....	38	Ontario.....	10
Hochelaga.....	5	Ottawa.....	13	Manitoba.....	
Huntingdon.....	24	Pontiac.....	1	United States.....	
Iberville.....	19	Portneuf.....	44	France.....	
Jacques-Cartier.....	3	Quebec.....	13		

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# REPORT "IN EXTENSO"

OF THE

## TWELFTH ANNUAL CONVENTION

OF THE

# DAIRYMEN'S ASSOCIATION

HELD AT ST. HYACINTHE

THE 5TH, 6TH AND 7TH DECEMBER, 1893.

At 2.30 p. m., on Tuesday December 5th, 1893, the President, Mr. Rev. T. Montminy, declared the Convention open.

### APPOINTMENT OF THE COMMITTEES.

For the examination of silage samples: The Rev. C. P. Choquette and Mr. S. A. Fisher.

Samples of Butter and Cheese: Prof. Robertson, Messrs. J. C. Chapais, W. W. Pickett and J. D. Leclair.

### AUDITORS' REPORT.

Messrs. Pickett and Desautels, appointed auditors of the accounts of the Secretary-treasurer, for 1893, not having had time to examine the accounts, will make their report before the end of the convention.



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## REPORT OF MR. P. MACFARLANE,

*General Inspector of the Society.*

*To the Members of the Board of Directors of the Dairy Association of the Province of Quebec.*

GENTLEMEN,

Owing to the satisfaction given by the working of the fourteen syndicates last year, there was a great increase in the formation of syndicates for this year; in fact, they were just doubled.

This caused your Board to appoint along with me another General Inspector, M. Saul Côté, who had charge of the travelling dairy school last year, and to give up the travelling school altogether; as you thought that, owing to so many syndicates being formed, it was not needed so much as it had been in the past.

M. Côté and myself arranged to divide the Province into two divisions—one north of the St. Lawrence River, and the other on the south side. M. Côté took the one on the north, while I had the south. There were twenty-eight syndicates altogether: twenty-four cheese and four butter syndicates.

There is room for forty for next year, and perhaps more; and I should again call attention to the fact, which I noticed last year, of inspectors having too many factories under their charge. It is quite impossible for an inspector to do justice to twenty-five or more factories.

There were three or four inspectors who had more than that number, and the results were not very satisfactory. As a general rule, those inspectors who had from seventeen to twenty factories produced the best results. I would advise the Board to lower the number of factories to, say, twenty or twenty-two at the very most. There was a great scarcity of inspectors. One county, Stanstead, had to go altogether without an inspector, and perhaps some of the others would have been better without one too. While at this point let me say that the results of syndicate formation has been on the whole good, very good; although, of course, there were a few inspectors working in the Province who were not capable of advancing the interests of their respective syndicates and the standard of dairy manufacturing to the extent desired by myself and the society, yet this is an evil which can be remedied. Allow me hereto say, especially to the rapidly talking cheese trader or buyer who is ready to condemn the whole system of inspection, inspectors, syndicates, society, etc., etc., on account of an inspector or two who is not competent, to consider, which I know is a rare thing for these men to do, that only two-thirds of the number of inspectors have a first class diploma. Last year, owing to the rapid and unlooked for growth of syndicate formation and the scarcity of good men to fill the position of inspector, the society was obliged to let second class diploma men take positions and to give also certificates enabling the holders to inspect one year, knowing that if they were not capable they would be replaced by others holding

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We have our butter ind there. We re October last, a perhaps and c selection and a manner as the examined, in f visited twenty and some of th factories. I ex fied as follows: boxes No. 1 an

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first class diplomas. This will remedy itself very soon; weed out the poor ones, and hold a very rigorous examination before granting diplomas. Upon the whole, the plan has turned out very satisfactorily.

The trial at the Toronto Fair with our cheese rather dampened our ardor, but the results at the World's Fair, 105 awards in the last competition, should show the men of Bristol that *French* cheese is not to be sneered at; and we trust the day is not far distant when we shall obtain our rights. Our exhibits, although not so numerous as Ontario, the percentage of awards was much better than theirs. Out of 105 awards we had four with 99½ points; Ontario, with 260 awards, had only five with 99½; ours were about 4 per cent., while theirs were only 2 per cent.

If cheese buyers wish to class cheese, instead of Finest Ontario, Finest Townships, and then French to bring up the rear, why not grade it like wheat: Finest No. 1, 2 and 3? Let us stand shoulder to shoulder in this matter and demand our rights. As a matter of course, it will take time to do so, as Englishmen are slow to acknowledge merit; but merit must be continuous, we must not be content with present attainments; let us still further improve, and when we are acknowledged we shall certainly be prepared for it. The very fact of three out of the four lots of cheese scoring 99½ points being made by French Canadians, and most of those scoring up high were made in sections where the French cows were in the majority, raises a point in my mind that the milk more than the men had something to do with these respects. It is a well known fact that the Canadian cow gives very rich milk, equal in many respects to the far-famed Jersey.

We have not yet attained to the same degree of perfection and uniformity with our butter industry as we have in the cheese department, but in time we shall get there. We received only seven awards at the World's Fair for creamery butter in October last, and seven for dairies, beating Ontario in butter. Although this is not perhaps and cannot be called a fair criterion of what we are doing in butter, as the selection and shipping of the butter for exhibition was not looked after in the same manner as the cheese, some of the butter being nearly a month old when it was examined, in fact some of it being nearly melted before it reached its destination. I visited twenty-five of the twenty-eight syndicates formed, once during the season and some of them oftener. I visited 253 factories altogether, creameries and cheese factories. I examined 493 tubs of butter and 16,851 boxes of cheese, which I classified as follows: 247 tubs butter finest and 146 fine; cheese, 5,688 boxes finest, 9,483 boxes No. 1 and 1,680 boxes No. 2.

I have not been able to give a statement in full of the inspectors, as in many places the factories have been in operation later than usual, many factories running the first half of November, while a few ran through to the end. I shall have it shortly and will have it printed with the annual report.

Our exports this year in cheese show a fair gain over last year. Bear in mind, also, that last year was the largest on record. They show a gain of nearly 40,000 boxes over last year, representing a quarter of a million more dollars than in 1892,

with possibly more cheese in this country than last year. Our butter exports have declined since last year; they are not nearly what they ought to be.

In summing up my report for 1893 I would say that the system of inspection has done a great deal of good to our cheese trade; in a short time we expect to improve our butter. Then let us maintain our rights, the Bristol Board of Trade to the contrary notwithstanding, and we may hope for better results in the future.

The whole most respectfully submitted,

PETER MACFARLANE,  
*General Inspector.*

St. Hyacinthe, Dec., 1893.

THE PRESIDENT.—As has always been the practice in our conventions, you are requested to make your remarks at the close of each lecture. There are always some points or other that require discussion and elucidation, and it is immediately after the lecturer has finished his address that he is best able to give any explanations that may be required. So, it is to be understood that the discussions are to follow at once the delivery of the lectures.

## REPORT OF MR. SAUL COTE,

*Inspector General.*

To the Members of the Board of Directors of the Dairymen's Association.

*Gentlemen,*

I have the honour to submit to you my report, as Inspector-General of the Butter and Cheese Syndicates.

After working nearly three months in organizing the Syndicates, I began their inspection on the 25th of May, finishing on the 26th of October.<sup>1</sup>

The territory assigned to me was that on the North Shore, extending from Chicoutimi to Ottawa. In it there are ten syndicates.

Although I had less than half the syndicates of the province to manage, Mr. Peter Macfarlane, the Inspector-General, was obliged to take my place in the syndicate formed in the counties of Argenteuil and Ottawa; and for this reason: in obedience to an order from your executive committee, I abandoned regular inspection from the beginning of July to the end of August, for the purpose of accompanying Messrs. Chapais and Livingstone in the lecturing tour they were making through the syndicates.

To judge by the enormous crowds that attended these lectures when I was present, they must be doing a great deal of good. Doubtless, the reputation of M.

<sup>1</sup> As the printing of this report was begun early in January, we are obliged to postpone the publication of the usual table of recapitulation to the end of the volume. E. C.

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Chapais was a leading cause of the gathering together of such numbers, many of whom came from far; but, all the same, it is very gratifying to see such a grand awakening among the farmers of the province, and I hope that this part of my work was as useful to others as it was profitable and pleasant to myself.

Diverted thus from the route that had been assigned to me, I had an opportunity of visiting a number of factories belonging to the syndicates of Mr. Macfarlane.

I paid 240 visits to 182 creameries and cheeseries, some I visited two or three times; I inspected 11,064 cheeses, and 1,482 tubs of butter.

With a view to the classification of the factories, their out-buildings, drainage, fittings, general management, and the goods made therein, I made a little table, like the one in our inspection note-book. I have only entered in it the cheese; it reads as follows:

CLASSES.	MODEL.	1	2	3	REMARKS.	
Factories, out-buildings, drainage	1	94	83	4	The creameries, as well as the cheeseries, are entered in this table, as well as their fittings and general management, but not the butter made.	
Fittings.....	1	134	46	1		
General management.....	1	91	84	6		
Making. {	Flavour.....	1053	6400	3509		111
	Body.....	950	6190	3849		75
	Texture.....	1000	6051	3933		80
	Colour.....	1125	6875	3006		54
Appearance.....	585	5509	4700	248		

If, in this table, I have not classified the butter that was in the factories, when I visited them, it is because it is very difficult, if not impossible, to examine the butter as we examine the cheese, for the tubs are generally all piled up and the covers nailed on. Still, I do not think I am wrong in saying that 75 per cent. of the butter that I saw was of good merchantable quality, and the remainder inferior.

I may, perhaps, seem to be exaggerating in giving in the table so large a number of ill-fitted factories and of products of inferior quality, in syndicated establishments, especially at a time when we were obtaining such wonderful success at the Chicago Fair. Still, I believe I am telling the truth. Besides, there is nothing surprising in it, since the greater number of these factories only came under the control of a syndicate last spring.

It must also be observed that we are becoming more and more hard to please, for in this, as in everything else, if we aim at perfection, as far as we can obtain it, we must keep on getting more and more exigent every season.

I am happy to say that the inspectors of my division have done their best to give satisfaction to their employers. At the same time I must admit that, in this sort of work, some succeed better than others.

In my opinion, if we want the inspection to be really efficient, the total number of factories in a syndicate, should never exceed 20.



A sad thing to mention is the multiplication of small factories that, utterly unable as they are to produce a good article, are veritable spoil trades: and, yet, how can they be abolished?

I think, too, that one of the reforms needed by our dairying is to pay every one his due. If we pay the patrons the real value of their milk, they will send in better milk in every respect; and this will put a stop to the trouble and bother that unfortunately exists more or less everywhere.

If butter and cheese be paid for according to their respective value, the progress of our dairy industry will be greatly promoted.

We are well assured that nothing encourages the production of good articles more than paying a fair price for it.

The most eloquent speeches, the best lectures, are less resonant in the ears of the man who has to earn his bread by his labour, than the ring of that sordid metal we call money, *i. e.* silver.

As to milk, I trust before long that the system of paying for it according to its richness will become the general practice, in spite of the inconveniences we see in it, since at any rate this is better than our present plan. On this point, the problem is solved, for we can now give every one his due.

But with butter and cheese it is not so; I fear it will take some time before we can get every one paid what is his due, if we are to judge by the past, for there is at present no sign of any alteration in the system of selling our dairy-products.

It is no very great encouragement to the dairy-farmers to make the necessary exertions, when they know that they shall derive no greater benefits by their attention than those derive who carry on their business mechanically. For it is asserted positively that all the cheese and butter sold to the same buyer, in the same place, obtain very nearly the same price, although there be sometimes a very marked difference in the quality of the goods. In such a case, he who has goods of the best quality only profits by half the difference that exists between his goods and those of his neighbour, which are inferior, while the neighbour gets the other half, which is more than his due.

This is not likely to stimulate zeal and to induce men to improve in their business. We know something about it; we are too well accustomed to hear the stupid reply to the advice we think it right to give: "Ah! all that is quite unnecessary; we sell as the others do."

Early in October, I was with one of our best local inspectors who was a good deal discouraged by the fact that, after having, by dint of great exertion, succeeded in putting his syndicate on a good footing, his makers no longer followed his advice. I visited several factories to get at the bottom of this; and all the makers confessed that they did not follow the instructions of their inspector, in order to arrive at paying their patrons as high per 100 lbs. of milk, as was paid by the non-syndicated

factories, when high, and when

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If, as I believe in principle they should aid us in our effort there are two reasons or we must find

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It being the lectures given by me to prepare this in inspectors whom received the details not possibly send St. Hyacinthe on ready for the next leads us to expect

St. Flavien, December

factories, where a better yield was obtained, by making a softer cheese which sold as high, and which, however, was not worth as much!

What a fine result! After having made so many sacrifices, to be obliged to follow in the footsteps of those who pay much more attention to quantity than to quality!

In speaking thus, my intention is certainly not to hinder the present movement in favor of syndicates. On the contrary, I wish this movement to progress until there shall be no unsyndicated factory in the province; so that, all the goods being, as much as possible, of equal quality, the average price paid for them shall be better.

To arrive at this as soon as possible, allow *mé*, Gentlemen, to suggest that your executive committee obtain from our export firms a declaration by which they state that the products of the syndicated factories are generally of the best quality, and that, in future, they will choose them in preference to goods from the non-syndicated factories.

If, as I believe, the buyers are in favour of the syndicates; if they think that in principle they are good things, they ought not to hesitate about taking this step to aid us in our efforts. If, on the contrary, they have no faith in this organization, there are two roads open to us: either we must discontinue spending our funds on it, or we must find some other outlet for our goods.

A stamp of any kind adopted by each syndicate would be a very simple way of denoting the derivation of their goods.

I may be wrong in speaking of a stamp on our dairy goods, especially on our cheese, since, according to certain agents of our export firms, it would be trouble wasted, for the stamp is removed from the boxes of our good cheese, in order to make it pass for Ontario cheese, (*Canadian Cheese*).

It is, then, very clear that, *vice versa* inferior Ontario and Quebec cheese are both passed off as being the product of our province: this is why on the other side of the ocean it is called *French Cheese*, a phrase that, it seems, is not pronounced without "making a face," a face irritating enough to provoke even those saints in paradise who, when in life, were natives of the province of Quebec. Still, I trust that the success we have just met with in Chicago will change these ideas, and cause our merits to be properly appreciated.

It being the custom that the reports of the Inspectors general form part of the lectures given before the annual convention of our association, I have been obliged to prepare this in haste, and to omit extering the work done by each of the local inspectors whom I had to manage, and for this reason: they themselves nor having received the details of the operations of all the factories in their syndicates could not possibly send in their reports to me. But as all the inspectors are to meet at St. Hyacinthe on the 4th of this month, a report as complete as possible can be get ready for the next meeting, which, I trust, will be as interesting as its programme leads us to expect.

Respectfully submitted,

SAUL COTÉ,

*Inspector General.*

St. Flavien, December 2nd, 1893.

DISCUSSION ON THE SYSTEM  
OF PAYING FOR MILK ACCORDING TO ITS RICHNESS.

*M. Saul Coté.*—I wish, Mr. President, to add a few words to the report I have had the honour to submit to you. Yesterday, the inspectors of syndicates were requested to impart to us any observations they might have made during last season, and to give us their individual opinion on the *system of paying for milk according to its richness*. I found that, generally speaking, they agreed upon the question of knowing if, yes or no, this system was advantageous. There seems to be no doubt about the excellence of the system; I have proved it whenever I have had to speak about it; but it is to be regretted that certain of the inspectors, while acknowledging the advantage of the plan, are not yet prepared to put it into practice.

In my opinion, it should be begun at once. These inspectors say that they are not yet sufficiently instructed in it; but I ask you, gentlemen, if we are not ready to begin now, if we keep on putting off the experiment, shall we be more ready to begin ten years hence? Still, as it is the general opinion of the inspectors that it is still too soon to begin, I must anyhow embrace the opinion of the majority of our inspectors, unless our association find means to remedy the evil. As for me, even after the experience of the syndicates, I am thoroughly of opinion that we should begin at once. I hold, I say, after what took place when the question of forming cheese and butter syndicates was being discussed, that the best thing to be done would be to encourage the best makers—a certain number of them, that is—to try the system of paying for milk according to its richness. When it is recognised as being a good plan, the rest of the makers will adhere to it of their own accord. I do not think it would be difficult to form, in each part of the province, an Association composed of a certain number of the best makers to make a trial of this system. These makers would take the milk of ten or twelve patrons, put it on one side, turn and turn about, for testing it by the Babcock, to ascertain its richness, and when the dividends were declared on that basis, and the best patrons found that it paid them to sell their milk according to its richness, they would, without doubt, be the first to call for the adoption of the system. Besides, it is in my opinion the fairest, as it is the most advantageous plan.

*M. Courchesne.*—When you speak of paying for milk according to its richness, do you mean to say that it answers as well for cheeseries as for creameries?

*M. Saul Coté.*—Such is my opinion, based on that of Dr. Babcock and many other authorities. There may be milk that would pay better for butter than for cheese-making, as there is milk that would answer better for cheese-making; but I believe, from experiments that have been made, that the quota of fat in milk plays as great a part in butter-making as it does in cheese-making. It is generally observed that in autumn the proportion of cheese to the 100 lbs. of milk is greater, and this is evidently due to the extra richness of the milk at that season. If this

be so, it is in cheese, and it be some exceptions are here, it has been made from it. very rare and I believe, then applicable to

*Mr. Ed.* ance. I hold decidedly the the yield of be the greater is the proportion been proved by those made by doubted it at as advantageous

As for me, interested, the makers. And paying for the sorry that the propose; but I have often as more, if they a work, they will means of arriv secure that both paid for accord must attain, for word, of all kin power to arriv est; the patron himself from the The question de Dairymen's Ass To-day the payr become necessar the working of patrons and mal



be so, it is important to ascertain the amount of fat in the milk, when used for cheese, and it is by the use of the Babcock that it can be ascertained. There may be some exceptions as to the quantity of fat that can enter into cheese, but these exceptions are but few. In general, in all the lists made in the States as well as here, it has been always proved that the richer the milk the more cheese can be made from it. Once more, there may be exceptions to the rule, but I hold they are very rare and only confirm the rule, since there is no rule without an exception. I believe, then, that the system of paying for milk according to its richness is as applicable to the cheesery as it is to the creamery.

*Mr. Ed. A. Barnard.*—I think M. Courchesne's question is one of great importance. I hold with the Inspector: the payment for milk according to its richness is decidedly the best plan that can be adopted by the makers. Everyone admits that the yield of butter is the test of the quality of milk, and that the richer the milk the greater is its value for making butter. As to cheese, it is also acknowledged that the proportion of fat in the milk it is made from is of vast importance. This has been proved by all the experiments that have been made in the States, as well as by those made by Mr. Robertson himself, who has come to the conclusion, though he doubted it at first, that the payment for milk according to its richness is a system as advantageous for the cheesery as for the creamery.

As for me, my opinion is that it is the only means of treating with fairness those interested, that is, those who supply the milk, at the same time that it satisfies the makers. And more; I feel that Mr. Côté's advice, to commence as soon as possible paying for the milk at the cheeseries according to its value, is wise advice. I am sorry that the inspectors of cheeseries are not all agreed to follow the course we propose; but I know that the cheesery inspectors have a great deal to do. They have often as much work as it is possible for them to do, and if they are asked to do more, if they are asked to carry out certain experiments in addition to their regular work, they will reply that it is impossible. It is then our part to study out the means of arriving at a solution of the difficulty by another road, to find a way to secure that both makers and inspectors agree upon a plan by which milk shall be paid for according to its richness. It is a result that we must aim at, an object we must attain, for it is the only means to get rid of all kinds of roguery; let us use the word, of all kinds of robbery, on the part of the patrons. We must do all in our power to arrive at this result. It is a question of public as well as of private interest; the patrons who supply the milk are as much interested in protecting each himself from the other as the makers are in protecting themselves from the patrons. The question deserves all our attention, all our study. Since the foundation of the Dairymen's Association we have every year made at least one step in advance. To-day the payment for milk in accordance with its richness is a measure that has become necessary, as much on account of the advantages that will result from it for the working of the dairy industry in general as for the injury often inflicted on the patrons and makers by the impossibility of the makers judging of the value of the



milk that each individual of their patrons brings to the factory. Again, it is a question that deserves all our attention, and I propose that a committee be formed—a committee composed of cheese-makers and other competent men—to study the results that have been arrived at in the factories where this system has been adopted, and to ascertain if this plan we are recommending merits to be generally followed out. M. Taché, a member of the Association, can give us very accurate and valuable information on the subject. For several years he has had great experience in the management of creameries. We are greatly indebted to him for the exertions he has made in promoting the interests of dairying in this Province. From him we may derive very useful instruction. With him is connected M. Zetterman, a man of great skill and capacity. M. Taché has spared no pains to establish a safe and satisfactory system, both as regards the patrons and the makers. He pays for the milk according to its richness, and has organized a plan by which he can analyze the milk of twelve or fifteen factories by the same process and with the same instrument. What is the consequence? It is this, M. Taché finds it answers his purpose, and that all the patrons are satisfied.

This is an experience from which we may derive profit. If it demonstrates clearly that payment for milk according to its richness is an advantageous system, why should we not do all in our power to put it into practice as soon as possible? I can understand that there may be some hesitation on the part of the makers; they seem to fancy that it would be so difficult to put it into practice; that, in spite of the advantages it offers, it would be quite as well to keep to the present system of paying for milk by weight. Still it would not be very difficult to establish an organization which would permit a patron to sell his milk according to its richness, and yet not impose a troublesome amount of toil on the maker. Let fifteen or twenty makers form an association and agree to send M. Taché every week samples of the milk they receive daily. Each of these makers should have small vials, in each of which they should put every day about an ounce of the milk brought by each patron, and at the end of each week these vials should be sent to the analyst. Each maker would do the same thing: nothing can be more simple. At the end of the week or month the analyst would make his report, describing the different analyses he has made, and, finally, he would hand to the makers the *percentage of fat* due to the patron on account of the milk he had supplied.

If Mr. Taché, with his twelve or fifteen factories, has succeeded in arranging a system capable of showing the value of milk according to its richness, it seems to me that a certain number of makers, associated together, might arrive at a result as satisfactory as Mr. Taché's, since he was alone in his successful attempt to organize the proper working of his twelve or fifteen factories. I think that, to put our idea into practice, it would answer if twelve or fifteen makers in different parts of the Province were to agree to send their milk (*samples?*) to a central office, where the test of its fat contents could be made. All they would have to do, would be to put samples of the milk they receive daily into the vials and to send it to the central office.

I propose to study this question and to report to the factory committee.

*The President.* The committee of which you speak.

*M. Saul.* I have not yet said anything against the proposition, but they all seem to think that it will be better to wait until we really more definitely postpone the question, they have said weekly to the milk will cost the milk.

*Mr. Roberts.* and I should like to see the subject. He has said, and I think he will.

*M. Parent.* a great deal of experience in this plan of cheese-making men last year, the most efficient man, former I found most satisfactory. I think it is quite itself, it is quite I will go so far as to say that the milk fairly, because the part of some

*A Delegate.* richness can be proved and my neighbor it is evident that I shall declare, I shall

I propose, then, that we appoint a committee of competent, experienced men to study this question. This seems to me to be a rational way of arriving at a satisfactory conclusion under the present circumstances.

*The President.*—Am I to proceed to the nomination of the members of the committee of which Mr. Barnard has been speaking?

*M. Saul Côté.*—I would observe that the inspectors in general are not systematically opposed to the use of the Babcock test for valuing the richness of milk. I said just now that the inspectors, while recognizing the excellence of this test, find that it is not yet sufficiently well known, and that they, the inspectors, are not yet sufficiently skilled in its application. I must add, to do them justice, that it is not against the payment for milk according to its richness that the makers object, for they all seem to be ready to admit the advantage of this system; but they seem to think that it is a question of opportuneness, and they ask themselves if it would not be better to wait a few years longer. Still, I ask once more, will these people be really more disposed to apply this system in two or three years, if they are always postponing the time to try it practically? The thing is so simple; as Mr. Barnard says, they have only to put an ounce of milk every day into a vial and to send it weekly to the analyst appointed. I see nothing difficult in this, nor anything that will cost the makers much.

*Mr. Robert Ness.*—Mr. H. W. Walker, of Huntingdon, will be here this evening, and I should like him to have an opportunity of expressing his opinion on this subject. He has, this season, tried the plan of paying for milk according to its richness, and I think he might give us some useful information.

*M. Parent.*—Last summer I made some experiments which have given me a great deal of enlightenment on one point. It is most important, if we are to succeed in this plan of paying for milk according to its richness, that we have in our cheeseries men who are thoroughly competent, well informed and judicious. I saw, last year, the results obtained at two factories, one under the management of an efficient man, and the other superintended by an inexperienced youth. In the former I found that the system of paying for milk according to its richness gave most satisfactory results, while in the other the attempts that were made failed completely. I think, therefore, that it is most important for the patrons that the managers of their factories should be men of capability and skill. As to the system itself, it is quite established as the most fair way of doing justice to the patrons, and I will go so far as to say that it is the only way of treating those who supply the milk fairly, because it is the means of protecting them from every kind of fraud on the part of some patrons.

*A Delegate.*—I do not very clearly see how the paying for milk according to its richness can prevent fraud. If I take a hundred pounds of good milk to a factory, and my neighbour at the same time takes thither a hundred pounds of poorer milk, it is evident that I shall have earned more than he; but, when the dividend is declared, I shall receive the money due to me for my hundred pounds of milk, and

my neighbour will also get the sum due for a hundred pounds of milk. It seems to me that, if one wants to cheat, one can always find a way to cheat.

*Mr. Barnard.*—But, my good sir, how can you imagine that you will be cheated by your neighbour, if the milk you deliver to the maker is sampled at the very moment you hand it over to him? The only way in which a patron can cheat his neighbour is by skimming off a certain quantity of cream from the milk he takes to the factory, or by adding water to it to increase its bulk at the expense of its quality. Now, it is precisely this that we want to prevent by our system of paying for milk according to its richness. If your neighbour skims off a certain quantity of cream, or adds water to his milk before taking it to the factory, you will not have the trouble of sending him to prison, if you can, by means of an infallible and well tested system, prove at once that he has tried to cheat you. When he finds once or twice that he has been caught thus in the very act, I do not think it will be necessary to prosecute him by way of teaching him to behave in future like an honest man. It is really sad to see the inspectors so apathetic about a subject the object of which is to get the makers to accept a system which can only be to their advantage.

*M. Saul Côté.*—I wish to deal fairly by the inspectors. Once more I say they are not opposed to the system; they simply say that, not being sufficiently instructed in the practice, they are not prepared to put the system into operation.

*Mr. Barnard.*—I think a good way to attain our object would be to get all the makers to belong to the syndicates. I know there will always be some who will lag behind; but that is no reason for discouragement. Such men, the enemies of progress, exist everywhere. When it was proposed to establish syndicates the majority of the makers were opposed to the system. By dint of exertion and work we have arrived at the results you see to-day. So we must not let our hearts fail us because some makers and inspectors are now hesitating; if they choose to remain in the background, that is their business; it is they who will suffer the most.

In conclusion, Mr. President, I again propose the appointment of a committee to study this question.

The following gentlemen were proposed and elected as members of the

COMMITTEE OF ENQUIRY ON THE MEANS OF POPULARIZING

THE SYSTEM OF PAYING FOR MILK ACCORDING TO ITS RICHNESS,

AS DETERMINED BY THE BABCOCK TEST.

Messrs. J. C. Chapais, J. de L. Taché, E. A. Barnard,	} Directors of the D. Ass.	Messrs. P. McFarlane, Saul Côté,	} Inspectors-Genera of the Syndicates.
William Parent, Elie Bourbeau, Louis Gilbert, J. N. Allard, L.P.Lacourcière		} Inspectors.	

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The committee to meet after the session, and to report to the convention.

*M. Saül Côté.*—In order to show the importance of calculating the value of milk according to the amount of fat it contains, I will give you some figures which were shown me by a factory inspector. He found that a man who supplied milk had received, for a sale of cheese, \$3.60, his milk having been paid for by weight; had it been paid for according to its fat contents, he would only have received 87 cents! This, I think, is an instance that will show clearly the wrong that certain suppliers of milk can inflict on the other patrons of a cheesery, if milk is paid for by weight. If, in one single sale, and that of so trifling an amount, a man could make such a profit at the expense of the other patrons, you can judge what might happen in large factories, where the milk, throughout the entire making season, is paid for by weight!

*M. Chapais.*—On the subject of this discussion, which I find very interesting, I will make a few remarks, the result of the work I have been called upon to do, which will perhaps throw some light on this question of paying for milk according to its richness. The result of these investigations has convinced me that the system of paying for milk according to its richness is absolutely necessary.

I made a comparison between the cost of milk at Brockville, at the Convent of the Sacred Heart, at Quebec, in Wisconsin, and at a farm at St. Denis, Kamouraska.

I found that milk cost, per 100 lbs., in Wisconsin, \$0.96; at Brockville, Ont., \$0.78; at the Sacred Heart, Quebec, \$0.42; and at the St. Denis farm, \$0.44. Is it not clear, by these figures, that the system of paying for milk according to its richness must be adopted? Here is a farmer who has milk worth 96 cents per 100 lbs., which will give him 4 cents profit, supposing the milk is sold at a dollar per 100 lbs. At the very same time, another patron, who has milk that costs 44 cents, will make a profit enormously greater: his profit will be 56 cents! This is the result of paying for milk by weight. But, on the other hand, if milk is paid for by richness, if one of these milks, that at 96 cents, is richer in fat, and contains 5 per cent. of that matter, he will be paid at the rate of 5 per cent. If the milk at 44 cents only contains 3 per cent. of fat, the owner will be paid at the rate of 3 per cent. It seems to me that it is clearly a simple question of justice. Moreover, from another point of view, this system will have the sure effect of stimulating the farmer to feed his cows as well as possible, in order to get as much out of them as he can.

I repeat, then, that it is of the greatest importance to every farmer that his milk be paid for according to its richness; it will be the means of supplying our factories with richer milk, and of inducing them to improve their herds. I hope every factory that has not yet put this system into practice will apprehend the importance of changing their system, and that before two or three years are over, we shall have in our factories diplomaed makers, able to put this system in operation, for it is as advantageous to the makers as it is to the patron.

#### DISCUSSION ON BUYING CHEESE ACCORDING TO ITS QUALITY.

*Mr. Barnard.*—Some one said just now, I believe, that, at present, in spite of the syndicates, in spite of the success the syndicated factories have met with, the buyers-



of cheese still persist in paying no higher price for good than they pay for ordinary cheese. The inspectors of the syndicates, too, report to us that it is truly discouraging that the syndicated makers find themselves forced to make a cheese of worse quality, because the buyer will not pay the price good cheese is worth. If this be the case, we must see to making a change; for it would be really a misfortune, after the efforts we have made to establish cheesery-syndicates, to find that the results obtained by them are not recognized, that the same price is paid for cheese made in them that is paid for the cheese made in other factories, where the same care is not taken that is observed in the syndicated factories, the makers in which are not so competent, and can evidently not make as good cheese as the cheese made in the syndicated factories. We have a proof of this in the success gained at Chicago by the Quebec cheese. There, Quebec cheese was recognized by the quantity of fatty matter it contained, and it is to the factory-syndicates, who spared no pains to obtain the best milk for their factories, that this success is clearly due. If, then, these syndicates have done so much for dairying in this province, this success must not be lost through bad faith, and I will moreover use the word, by the dishonesty of certain buyers, who, if what is said of them be true, make false statements to the makers to make them believe that they are paying the price of good cheese for cheese of inferior quality, when the reverse is the case, as they really pay for good cheese the same price as they pay for inferior goods.

*M. S. Chagnon.*—As to this, I have heard, in our meetings and elsewhere, buyers of cheese condemn this system of purchasing goods, with a fixed price for good and bad alike; I have heard them express themselves so forcibly against the system, that I asked myself if we must believe the inspectors who tell us that the buyers pay for good cheese the same price they pay for inferior. It is essential that this point be elucidated.

*Mr. Barnard.*—Does not M. Côté contradict this assertion? If I understand Mr. Chagnon, in his opinion, there is no fault to be found with the buyers of cheese, and, consequently the inspector's report is unfair to them. If so, M. Chagnon is right in saying that the point requires elucidation.

*M. Saül Côté.*—I am prepared to repeat my statement. One of our best inspectors of syndicates, I ought to say several of our best inspectors have complained that the makers are turning out a style of cheese inferior to that they were making not long ago, because the buyers had begun a system of paying for good cheese the same price they paid for inferior. These makers argued that, after all, it was useless to exercise great care in making their cheese, if the price paid for bad cheese was to be as high as the price paid for good.

*Mr. Barnard.*—If M. Côté is right, I hope the buyers will show us the other side of the question. They are represented here by a man who is able to explain matters to us, and we are ready to discuss the matter so as to arrive at a certainty as to the accusations that have been brought against the buyers.

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*Mr. W. W. Pickett.*—As the representative of the firm of A. A. Ayer, I wish to state that M. Côté exaggerates in the accusation he has just brought against the general body of cheese-buyers. If three or four buyers have behaved as M. Côté says, that is no reason for accusing the whole of the buyers of behaving so. For instance; I ask M. Bourbeau if, in the county of Bagot, he has found the buyers paying for good cheese the same price as for bad.

*M. Bourbeau.*—Judging from what the makers say, they have no reason to complain of the buyers; but I must say that it is not in accordance with my own knowledge that the price obtained is a satisfactory price. It may be that they boast of having sold high enough, and yet have only got an inferior price; and I must add that, according to my makers' reports, there is no great difference between the prices obtained for good cheese and the prices obtained for inferior.

*M. S. Côté.*—It is possible, as M. Bourbeau says, that some makers have bragged about having got a price more satisfactory than it really was. This is often done.

*M. Bourbeau.*—This is what a buyer told me about the sale of cheese. He said that it paid the patrons better to send their cheese to Montreal, because, in his opinion, the number of buyers there who vie with each other for the lots of cheese cannot but enhance its price. I do not think this buyer held the same language to the makers; but I must say, however, in fairness to Mr. Pickett, that when I have sold him cheese, I have always been satisfied with his conduct; he has always dealt fairly with me.

*Mr. Pickett.*—I am glad to hear that M. Bourbeau does me this justice. As I said before, I am not responsible for the acts of others, I speak for myself. As for me, I have always paid two prices, for the two different qualities of cheese I bought. Every maker in my district you can name, will tell you the same thing. I do not believe one of them will tell you that I have paid for a bad cheese the price of a good one. When I have paid the same price for different lots of cheese, it has been because all the lots were of the same quality.

*M. Chapais.*—I willingly believe that an honest buyer is to be found, but the question concerns buyers in general, and I do not think all the buyers follow the example of Mr. Pickett.

*M. Chagnon.*—I do not think it would be inopportune to settle how soon after making cheese should be marketed. In my opinion *it should not be sent off until at least twenty days have expired from the date of its manufacture.* It is very certain that cheese sent from the factory five or six days after making must necessarily lose in value before its arrival on the market. It is, then, important to know in how many days after making cheese should be sent off, in order that it may preserve all its good qualities up to the time of its arrival at the entrepôt. This may perhaps explain to us how it happens that cheese, found to be inferior on the Montreal market, was paid the same price for by the buyers in the country as cheese that was good on its arrival there.

*Mr. Pickett.*—This seems to me to be an interesting point to be elucidated, and the result of this investigation may have the effect of doing justice to the buyers, while at the same time it will satisfy the makers.

*Mr. Barnard.*—Here, then, are a number of questions for study; they are all interesting and important, but the most important of all seems to me to be, is M. Côté's assertion true? It has not yet been proved that the statements of M. Côté are unfounded. Many still are convinced that the cheese of the non-syndicated factories is frequently inferior in quality to the cheese of the syndicated factories, and yet receives the same price from the buyers. Mr. Pickett, indeed, told us that he pays different prices for different qualities of cheese, but he also told us that he was only speaking for himself and was not responsible for the acts of the other buyers. For my part, I believe that Mr. Pickett is acting honestly, but, once more, he has not shown that the statements made to us by M. Côté are false. The question, then, is still under investigation, and, I repeat it, Mr. President, we must drastically clear up the point. If the makers in the syndicated cheeseries say among themselves: What is the good of all the pains we take to make cheese of superior quality, if the non-syndicated makers get for their cheese, which is of inferior quality, the same price we get for ours? If that is the position they take up, what on earth has been the use of the efforts we have made in favour of the syndicates in particular, and for the interests of the dairy-industry in general?

*Mr. Pickett.*—In reply to Mr. Barnard, who says that I have not proved that M. Côté's statements are false, I will observe that M. Côté has not given me a chance to refute his averments. He asked for explanations, I gave them, that was all I aimed at doing.

*A Delegate.*—I happened to know all about the price of cheese throughout last summer; I was on the wharf at Montreal every time lots of cheese were brought there, and I saw three or four thousand cheeses sold.

*Mr. Pickett.*—Did you see many sold at the same price?

*The Delegate.*—Occasionally I saw different lots of the same quality sold at the same price; but, generally speaking, I saw the same price paid for cheeses of different qualities.

*Mr. L. T. Brodeur.*—Some one remarked just now that it was more advantageous for the makers to take their cheese to the Montreal market than to sell it at home to the buyers; and I agree in this opinion, because at Montreal there is a crowd of firms that compete with each other in buying cheese, while in the country the buyers pick out the best time, *i.e.*, when there are no competitors to fear, to make their bargains. It is within my own knowledge that makers of different districts have for several years practised this system of taking their cheese to Montreal for sale, and I believe, from what they have told me, that they all find their account in it. I believe, too, that in Beauce, where, if I am not mistaken, there are twenty-seven factories, they also decided, a short time ago, to take all the cheese of their twenty-seven factories and sell it at Montreal. It was arranged that each of the makers should pay freight in proportion to the quantity of cheese he sent. From the experience they had of the effect of selling their cheese at home, they arrived at the

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conclusion that it would be far more profitable to take their cheese to market themselves.

*Mr. Pickett.*—In this case it would be desirable, as M. Chagnon said just now, not to send the cheese until the expiry of a certain time after making; otherwise, losses might befall the makers, and blame still attach to the buyers.<sup>1</sup>

*M. Saul Coté.*—In this, I agree with Mr. Pickett. But, as to the buyers, I must tell him that there has never been any cause of complaint when inferior cheese was being sold on the Montreal market. Let the buyers always pay the real value for the cheese, and Mr. Pickett has no need to fear that we shall complain. All that we ask of them is, that they pay for good cheese the price good cheese is worth, and for inferior cheese the price inferior cheese is worth.

*Mr. Barnard.*—True; this is exactly the point; to pay the price of good cheese for good cheese, and not to have the same price for both good and bad. I affirm, Mr. President, that the cheese-buyers that do this, *i. e.*, who profess that they pay for bad cheese the price of good, when they do just the reverse, these buyers, I affirm, are committing a theft, a theft just as much as if they stole the money out of the makers' pockets. I affirm once more, that an honest merchant, an honest shop-keeper, cannot, for any reason or under any circumstances, behave in this way. The results of such a mode of dealing are disastrous for several reasons. They are disastrous as regards dairying in general, because makers of cheese, knowing that they will not get a higher price for their best cheese than for the inferior qualities, will end by taking no great pains in the manufacture, and will only turn out second-rate goods. This, then, is a result highly injurious to the general interests of dairying. I say, moreover, that it is a theft to the detriment of the makers, because they do not obtain the price to which they are entitled: I, of course, speak of the makers of good cheese. We must, then, Mr. President, spare no pains to put a stop to this way of dealing. It is time to stop these thefts, since, as I said before, thefts they are: it is time, too, to put a stop to the proceedings of the buyers, who, if what is said be true, do all in their power, intrigue in every way, to prevent the non-syndicated makers from becoming members of the syndicates. If what is said of them be true, they make all kinds of false representations to these makers to trammel the steps we are taking to persuade them to enter the syndicates.

*Mr. Pickett.*—As to what concerns me personally, I affirm that I have never made any false representations, but I have often reported sales of cheese at the highest rates, and deducted from the same (if any inferior cheese was found in the lot) a certain sum to cover the loss on the inferior quality. The maker or the proprietor *bears this loss*, because he guarantees the best cheese to the patrons; but he does not necessarily tell his patrons about it. I cannot see any dishonesty in this, for the patrons lose nothing; but if, on the contrary, they knew that the maker had

<sup>1</sup> Mr. A. A. Ayer has often advised makers not to send away cheese less than fifteen days old.—E. C.



inferior cheese among his parcel, that would greatly injure his factory, which is often his sole dependence; I think the makers have rights as well as the patrons, and I see no necessity for the maker to tell them of a fact that will do them no good, and greatly injure and perhaps ruin him. I have known patrons leave a factory because the maker unfortunately happened to have turned out a bad lot of cheese; and yet there is no maker that can say he has never been unlucky! So, I repeat, I see no theft in this.

*Mr. Barnard.*—I understand, as Mr. Pickett says, that the buyers cannot pay for second quality cheese the price of cheese of first quality; but this is not the point I am discussing with him; we certainly have not had this reproach to make to the buyers. But, I repeat what I said just now, that it is monstrously unfair on the part of the buyers to have only the same one price for good and for bad cheese: that is precisely the reproach we make to the buyers.

*M. Chapais.*—I, too, understand that neither Mr. Pickett, nor any other buyer, is disposed to pay the same price for second quality that he pays for first quality cheese. But, without exactly characterising it as a theft, I say that it is a practice essentially bad, and an unfair one towards the makers, to have only one price for the different qualities of cheese. For, no one shall persuade us that it is for the purpose of paying as much for bad cheese as for the good that the buyers have only one price for the two qualities. Besides the money loss that the suppliers of milk incur by this, there is another fault in the practice; it is likely to deter the makers from trying to make the finest possible goods. I think, then, that Mr. Pickett is wrong in defending this practice.

*Mr. S. A. Fisher.*—I, too, like those who have been speaking, hold that the practice is unfair both to the makers and the patrons. If this practice is followed, the patrons cannot blame the maker for any mistakes he may make, for he, with cheese of the second and third quality, might reply that he had sold for the highest market price, and the patrons would have nothing to say. This practice is also unfair to the makers, because they would all enjoy the same reputation in the eyes of the public; because they who take greater pains than others, who make better cheese than others, are not thought more of by the public than are the second rate makers. Therefore, I think that the buyers should give up this practice.

*M. Chagnon.*—Allow me to relate a fact within my knowledge. I met a maker who told me that he had lost \$75 on a lot of cheese he had sent to Montreal. When the next sale took place, the man who had bought the first lot would not buy the one offered, because the cheese was of inferior quality. This may serve, in fairness to some buyers, to show that they do not all act alike. I think it is most important to have, above all things, good makers. If the proprietors or patrons of a factory perceive that their maker is not skilful, it is to their interest to hire another at once. I knew a buyer, in Maskinongé county, who knew beforehand in what factory he was likely to find good cheese, and equally, in what factory he would find cheese of second quality, and that because he knew the makers. I think, then, once

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more, that the proprietors and patrons of cheeseries must adhere tenaciously to the rule of having only competent men to manage their factories.

*The President.*—I willingly believe that, as Mr. Pickett and M. Chagnon say, all the buyers do not act alike; but that does not prevent us from having the right to verify the thing, when it can be verified, and from taking every possible means to obviate the inconveniences resulting from the way in which certain buyers act. It is very certain that we shall not complain about the inferior qualities of cheese being paid for at their true value: Mr. Pickett may be sure of that. But it is only too true that we have often to note that cheese of the best quality is sold at the same price as cheese of inferior quality. It is this state of things that we must attack, and it is our duty to study the question in order to see if there are no means of arriving at better terms with the buyers. I think it would be a good plan for the inspectors to have a stamp by which the different qualities of cheese might be distinguished; this would be an official mark by which the cheese of such or such a quality would be recognized at Montreal. I think it might be tried; I think the inspectors, who have already done us great service, might do us still greater by putting into practice the system I propose.

*M. Courchesne.*—Last summer, I happened to visit a factory in which the cheese used to go bad 15 days after its manufacture! Up to that time it was of good quality. The proprietor had, at the beginning of the season, sent a lot to Montreal, and got but a moderate price for it. At the second sale, he went thither himself to see what was the matter. The buyer then said to him: "You have a large factory; you make a good deal of cheese, I should be glad to take it all, but as it is not of the best quality I cannot buy it. I advise you to bring your cheese here sooner after it is made; why do you keep it so long? It ought to have come to market a fortnight ago. I cannot buy this cheese as first quality cheese, for at the end of three weeks, I shall have to put on the market only cheese of the second or third quality."

*M. Parent.*—It is very clear that this cheese was made from bad milk, and had lost its quality as it grew in age. At present, according to my idea, the most important thing is to come to an understanding with the buyers, and get them either to support the syndicates, or to oppose them openly. It is my firm belief that, to have good milk in the factories, they must all be syndicated. For, if a factory, belonging to a syndicate, refuses the milk of one of its patrons, what happens? Why, that patron, knowing that his milk will be accepted by an unsyndicated factory, takes it there at once. It is clear that, if this sort of thing continues, our cheese will end by losing both its reputation and its price; and yet this is done every day. Patrons who cannot get their milk accepted by a syndicated factory, take it to a factory that does not belong to a syndicate, and the latter accepts it at once, because the manager knows that he can sell it (*the cheese?* Trans.) always at the same price. The buyers know the fact, and the makers that belong to the syndicates are far from benefiting by it. Once more; I think it matter of vast importance that we should agree with the buyers, so that they shall not only abstain from preventing the

makers from belonging to the syndicates, but that they shall join us and our inspectors in promoting the prosperity of the syndicates.

*Mr. Barnard.*—I have repeated over and over again, and I say once more, that it is through the syndicates that we shall succeed in remedying this fault. The makers must, by all sorts of means, be encouraged to become members of the syndicates. Until we arrive at this there will always be something defective in our organization.

It was proposed that the session adjourn, but the President suggested that the discussion should be continued among the delegates, while the Board of Directors was sitting.

*M. Côté.*—I think that in justice to Mr. Pickett we ought to accept the reasons and explanations he has given us as regards himself. He assures us that, for his part, he has never practised the system which the buyers in general are accused of practising; so I think it would only be fair to him to declare that the words "theft and fraud," which have been employed during this discussion, do not apply to him. Now, after the explanations we have had with Mr. Pickett, I should not be surprised to find that he would have no objection to talk over his brother buyers; to prove to them that good cheese is worth more than bad; to let them know that there are great complaints made of their dealings, and that it is time for them to put a stop to these complaints by no longer paying the same price for good that they pay for bad. I believe Mr. Pickett could greatly influence the buyers on these points, and that he could get them all to agree to work together in favour of the syndicates. For there is no use in disguising it, this system of paying the same price for the different qualities of cheese is practised by a great many buyers. I have often met with instances of it; in the Saguenay and at Lake St. Jean, I have seen different lots of cheese bought at the same price when there was an enormous difference in the quality of the cheese. It is clear that in such cases the advantage is not on the side of those who have the best cheese, any more, indeed, than of those that have the less good; since, in general, people do not pay more for inferior cheese than it is worth in order to put it on the same level as cheese of good quality; whence I conclude that the factories that make good cheese are not encouraged, and that the system should be altered.

*Mr. Pickett.*—I am perfectly ready to work in favour of the syndicates, as I have always done, but there are many reasons why the makers do not enter them; for I think it is not the fault of the buyers only that all the makers are not members of the syndicates.

*M. Côté.*—We do not say that this is entirely the fault of the purchasers; but I think a great share of the blame may be laid upon them on account of their system of buying cheese.

*Mr. Pickett.*—I have just remarked that I am in favour of syndicates, and that I have already worked in their favour. I may add that I have always tried to per-

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*M. Côté.*—Are you disposed to labour generally in the interests of the syndicates?

*Mr. Pickett.*—I tell you that I am so disposed, when there is a competent inspector, one who is fit to manage a syndicate; but I regret to say that it is not all the inspectors who are competent; some there are who do not discharge their duty.

*M. Côté.*—In the best things there are defects.

*Mr. Pickett.*—I have always worked in favour of the syndicates; every one knows it. M. Bourbeau, for instance, knows well that I did my best for them last year, in Bagot, where I did a great deal to aid in the formation of the syndicate of that county.

*M. Côté.*—We understand each other, then, perfectly; all I ask for is that the Board of Directors continue their labours in favour of the syndicates, and get the buyers to work in concert with them. If all the buyers thought as Mr. Pickett does, our affairs would go along swimmingly.

*Mr. Macfarlane.*—From what has fallen from Mr. Pickett during the discussion, I conclude that he is in favour of the syndicates, and I do not think that it is he who has brought about the differences between the buyers and the makers. But it is also true that all buyers are not like Mr. Pickett. He has spoken for himself alone; and we still are confronted by this certain fact: the cheese-buyers in the Province, as a general rule, do not do justice to the makers of the choice qualities of cheese. This fact is to be found asserted in the great majority of reports sent in by the inspectors, and very much to be regretted it is, for, if it continues to be the case, dairying in Quebec will have a great deal to suffer, since in this system good cheese has no more value in the eye of the public than cheese of inferior quality. It is highly to be desired that all buyers were like Mr. Pickett; and I agree with M. Côté in saying that Mr. Pickett would do us a great service by persuading his brother buyers to adopt a fairer system.

*M. N. E. Clément.*—I will try to epitomize this question, so highly interesting to the cheese-makers and to the dairy industry of Quebec. I shall speak of the advantages that syndicates confer upon us, and that they would give us in greater abundance if we could get a fair system of cheese-buying put into practice. I think the first reason that keeps the makers from belonging to the syndicates is that the patrons will not contribute to the cost of inspection; then, the makers, the cheesemen if you like, those who are at the head of large factories, find it rather hard upon them to have to pay the whole expense of the inspectors of cheeseries. This is what hinders many makers from belonging to syndicates; it is having to pay \$10, \$12, \$15 for the wages of an inspector. If the patrons would contribute half or a share of the wages paid to the inspector, I do not think any makers would refuse to belong to the syndicates.



I understand that the buyers may sometimes pay the same price for the cheese of non-syndicated factories that they pay for the cheese of syndicated factories. I see that this may sometimes be done with justice towards some of the non-syndicated factories, for these, too, may make cheese of the best quality. But it also pretty frequently happens that the non-syndicated makers, rather than tell their patrons that their cheese has fetched a lower price than the cheese of other factories, prefer paying the difference out of their own pockets, and tell the patrons that their cheese has fetched the same price.

This cannot be laid to the charge of the buyer, but the effect is always the same. The patrons say among themselves: "Why should we belong to a syndicate; we do not want inspectors; we sell our cheese at the same price others do?" I have paid attention to this for some time, and this is what I have always found to be the case. I find it so in my own parish, where the value of the syndicate is not understood, precisely for this very reason, that the patrons of the non-syndicated factories get the same price for their cheese as the syndicated ones. Then they say: "Why pay an inspector when we can do without him, seeing that we get as much for our cheese as the other factories?" I am certain that in a great number of parishes the cheese of non-syndicated factories sold, this year, for the same price as the cheese of syndicated ones, and I think I may say, from personal observation, that in many cases there was a vast difference in the quality of the two classes of cheese. I have not learned what took place in *all* the parishes, but I have ascertained personally that many cases of the kind I have mentioned have been known to occur. How, then, can you think it likely that the patrons would see the great importance to themselves of belonging to the syndicates. They keep on saying that they do not need inspectors and that the wages they pay them is money wasted. This is the real state of things at present. But do you not think that if the buyers were to agree to make generally a difference in price between the cheese of the syndicated and the cheese of the non-syndicated factories—I do not ask them to make unfair distinction against the non-syndicated factories, when their cheese is really good—do you not think, I say, that this would be the best way to induce all the makers to belong to the syndicates? And this would be a most important gain, for it is very certain that the inspectors of syndicates have been of great service to us, that they are so still, and that in future they will be so still more, if we can succeed in convincing the patrons that it is to their advantage that they become members of the syndicates.

I was happy to hear what Mr. Pickett said, and I trust he will redouble his efforts, as far as his influence extends, to aid us in the establishment of syndicates in every place. I have pointed out a very efficient way of attaining this end, and, so, I leave it to your consideration.

*M. William Parent.*—I think it would be advantageous for the syndicates to have a stamp to distinguish between their cheese and the cheese of other factories, supposing that the buyers were to agree that cheese bearing this stamp should be invariably quoted at, say, one-eighth or one-quarter of a cent higher than the cheese

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of the other factories, of course on condition that the stamped cheese was well made from good milk. I think that this difference established in the price of the two kinds of cheese would be sufficient to induce the patrons to join the syndicates, and this would tend to bring about the result we have always sought to attain: the uniform delivery on the market of a cheese of the best quality.

If we were very successful at the Chicago fair, if we won there the highest number of points for our cheese, that was due to the richness of the milk used in the making of the cheese; and the whole result is owing to the efforts of the syndicates, that have tried to have the best milk provided for the manufacture of their cheese. And these results must not be lost, after we have obtained them, through the faulty system of the buyers of paying for bad cheese the same price as for good. It is by encouraging the syndicates, by getting all the makers, if possible, to join them, that we shall cure this trouble, and it is by establishing a difference between the price of the cheese of the syndicated and non-syndicated factories that we shall succeed in inducing all the makers to join the syndicates.

*Mr. Pickett.*—The plan M. Parent has proposed to us would be a very good one if we could apply it with fairness to every one. It is easy enough to say: Pay more for the syndicated cheese than for the non-syndicated; but suppose we find at a non-syndicated factory as good cheese as that of a syndicated factory, do you think it would be fair to the makers and patrons to pay less for their cheese than the other; I do not believe that any such difference can be fairly made between them.

*M. Parent.*—I thoroughly understand what Mr. Pickett means; but I think the syndicates ought to be protected and the good maker encouraged. It is not only the private interests of the patrons and makers that is concerned, but the reputation of our cheese is in question. A maker that refuses to join a syndicate is, in my opinion, doing wrong, for he is acting against the interests of the dairy industry of Quebec. I believe, too, that it is by granting some extra privilege to the cheese from the syndicated factories that we shall succeed in saving the reputation of their cheese, for, after all the attempts that have been made, I believe this is the only way in which the makers can be induced to join the syndicates. Once more; the reputation of Quebec cheese is in question, and I believe that it is the duty of all patrons and makers to concur in efforts to establish that reputation and to maintain it; and I believe, too, that those who lag behind are not so deserving as those who labour earnestly for the great interests of the dairy-industry of the Province.

*M. Plamondon.*—What M. Parent has just said seems to me to be wise. I think it would be unfair to attribute as much merit to the makers in the non-syndicated factories as to their brothers in the syndicated ones, because, as a general rule, those who refuse to join the syndicates are, for the most part, men who expect to sell their cheese as high as the cheese of the syndicated factories, and trust to be able to make cheese with milk of bad quality, milk that has often been refused by makers in the syndicated factories. I believe, then, that M. Parent is right in saying that it is fair to encourage the syndicated makers.

I have not much experience in these things, but I find M. Parent's reasoning good, because, in preference to certain private interests, the public interests at large must be protected; progress, before everything, must be urged on, and that as quickly as possible. On the other hand, I understand how Mr. Pickett, as a cheese-buyer, and especially as an honest buyer, fears to commit an injustice when he has to buy a good article in a non-syndicated factory; but, again, as M. Parent says, it is the reputation of our cheese that is in question, and those who lag behind, those who, from wrong motives, do not labour in behalf of the general interests of our dairy business, do not deserve as much encouragement as the men who are more progressive. Take me as an example: it may be supposed that I refuse to concur in the formation of a syndicate in my own county because I have a personal interest in doing so, probably because I hope to be allowed by my maker to deliver bad milk, to the detriment of my neighbour. Another man may perhaps give as his reason that it is too expensive; but this objection is not, in my opinion, well founded, for if the \$15, which the salary of an inspector costs to each party, brings back \$50, that would not be a reason for any one to object to joining a syndicate, just the contrary! It seems to me that there can be no reasons, except those I have mentioned, why a patron or a maker should refuse to join a syndicate; that is to say, those who refuse to join hope to profit in sending in to their maker milk that would not be accepted at a syndicated factory, and this is easy enough for them to do on account of the system practised by buyers of having only one price for the cheese of two different kinds of factories.

It is for this reason that I see nothing unfair in cheese from the syndicated factories being bought at a higher price than the cheese of the non-syndicated factories. While stimulating the makers, it would be the best way of preserving the reputation of our cheese, and thereby favouring the progress of the dairy industry of the Province.

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*The first evening of the convention having been devoted to the banquet in honour of M. J. de L. Taché, an account of which will be found in a further part of this report, the official opening session was postponed to the 6th December.*

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SECOND SESSION.—WEDNESDAY EVENING, DECEMBER 6TH, 1893.

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The session opened at 10 a.m., the President, l'Abbé Montminy, in the chair.

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## MR. MACPHERSON'S LECTURE.

### INCREASING THE FERTILITY OF WORN-OUT FARMLAND.

All arable soils, in their virgin state, which grow crops successfully, contain the elements of plant food in varied proportions and amount, and also all different kinds of farm crops use the same elements contained in the soil, but the proportions required for each differ. Hence, the importance of a proper rotation of crops to abstract these elements, which are by nature in the soil, or applied by the hand of man, so that the soil shall not have a superabundance of any one element, to be of no pecuniary service to the owner.

There are three main sources of plant-food: the mineral ash, nitrogen and carbon. The one is derived largely from the soil, the others from the air. The leading constituents of the soil which all crops appropriate are nitrogen, phosphoric acid, potash, lime and magnesia, and several others usually in large abundance in all soils, but nitrogen, phosphoric acid and potash are the most taken up by crops, and usually the least abundant in soils, hence they are the quickest exhausted. The composition of average good virgin soil contains per acre about 2,500 lbs. of nitrogen, 2,500 lbs. phosphate and 3,000 lbs. potash. This amount is sufficient for about fifty to seventy-five full crops of grain and hay. Although this apparently large amount of plant-food is in the soil, yet it is so chemically combined with other materials, principally carbonates, that the roots of plants are not able to appropriate it fast enough for rapid growth; and, again, the roots of plants, as sown to produce crops, are only able to come in contact with a small proportion of the whole soil. Hence, the necessity of having plant-food in large abundance and in a soluble form, so as to be available for the roots to obtain sufficient to form a large growth. Good cultivation, proper drainage and good, vigorous seed promote the dissolving of plant-food in the soil so as to make it available. Yet it should be apparent to all farmers that the more thorough the cultivation, and the more perfect the drainage, the quicker the exhaustion of the soil elements which go to produce plant growth. There is a limit to all soils for crop production; and when we consider that almost all old soils are beginning to show a diminution of crop from actual lack of sufficient plant-food for the roots to appropriate to produce a full crop, a vital question arises, how shall such soils be made fertile again at the least cost and in quickest time?

There are two ways now known of doing this practically, which are as follows: the applying of commercial fertilizers, such as guano, mineral phosphate, superphosphate, bone-dust, dried blood, nitrate, potash-salts, etc., etc.; the other is stable



manure, either manufactured or produced on the farm or purchased elsewhere. To arrive at a comparison of the cost or value of the real plant-food in cash of these fertilizers, it is necessary to know the constituents of each article of fertilizers in relation to the amount of nitrogen, phosphoric acid and potash which they individually contain, as compared with their actual cost after being applied to the soil.

The values of nearly all commercial fertilizers are alike, all being based on the following prices: Nitrogen 15 cents per lb., phosphoric acid 6 cents, and potash  $4\frac{1}{2}$  cents, and the prices from \$15 to \$60 per ton, which is according to the contained parts of the above ingredients. The value of stable manure is more difficult to estimate, and is a more general plant-food, usually containing all the ingredients of organic and inorganic plant-food necessary to promote vigorous health and growth. The constituents of stable manure vary in a very marked degree, and are only known when a chemical analysis is made, or when the chemical constituents of the food are known, the class and kind of animal, and how the excrements, liquid and solid, are preserved afterwards. It is now a matter of very easy calculation to know the value of stable manure in all its constituents, when the excrements are properly preserved and the food given daily is considered. For example, a balanced ration for a milch cow for a day should contain 26 lbs. dry matter,  $2\frac{1}{2}$  lbs. albuminoids and 15 lbs. of carbo-hydrates. This daily ration usually contains  $\frac{3}{8}$  lb. nitrogen,  $\frac{1}{5}$  lb. phosphate and  $\frac{1}{2}$  lb. potash. Valuing these at the usual market prices—nitrogen at 15c.=9c. per  $\frac{1}{5}$  lb.; phosphoric acid, 1c.;  $\frac{1}{2}$  lb. potash, 2 $\frac{1}{4}$ c.—the whole equals 12 $\frac{1}{4}$ c. One-fifth of this is usually taken to produce milk, which leaves about 10 cents worth of fertilizers daily, and if 5 lbs. of straw is used for bedding (and it should be used), it adds about 1 cent more to its value daily. The value of a maintenance ration is but 3 cents; and so the value of all stable manure is determined largely by the way it is preserved afterwards. Should the liquid be not saved, and should the heating be allowed to be excessive, the nitrogen forms into ammonia gas and passes off into the air; and should water and rain be allowed to leach the soluble parts, then again a severe loss would be experienced—by given results of experience, fully one-half. The average weight of excrements voided by a mature animal, fattening or in milk, is about 100 lbs. per day, liquid and solid. It therefore takes twenty days to produce one ton. This one ton would contain (when the animal is fed a balanced milk ration) 12 lbs. nitrogen, 8 lbs. phosphate and 20 lbs. potash. This will make about \$2 per ton, at the usual market value of nitrogen, phosphates and potash.

To get at a comparative cost of fertilizers in each of the different named articles, a considerable problem has to be solved. In the first place, the cost of commercial fertilizers is easily known by the market value and cost laid down on the farm, but cost and value of stable manure when manufactured and preserved on the farm is considered a much more difficult question to answer, as the market value of food, the market value of animal products from such food, and the labour cost to perform the whole operation have to be counted. I will here give one or two practical examples, which the writer has personally experienced and operated for the past five years, for the production of milk, beef and fertilizers.

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## MANUFACTURE OF FERTILIZERS.

A steer costing \$30, weighing 1,000 lbs. live weight, can be fed for six months at a cost for food of \$25, labour \$2, interest \$1, insurance 25 cents, use of stable 50 cents, half a ton of straw for bedding \$1.25; total cost of steer when finished, say, \$60, and should make a gain of 2 lbs. per day. This would make the steer weigh when finished 1,360 lbs., and it should be worth 5 cents per lb. live weight, which would make \$68. The fertilizers produced from such feed would be 12 cents per day including the straw as bedding, which, for 180 days, would make, say, \$20, which value is reckoned on the same basis as commercial fertilizers containing only nitrogen, potash and phosphoric acid. Stable manure, properly preserved, has many other valuable ingredients, such as lime, magnesia, soda and other mineral elements, besides a large quantity of humus, which is very valuable to soils.

## MILK PRODUCTION.

Example in producing milk to make the greatest amount of fertilizers:

A newly-calved milch cow will cost, say .....	\$35 00
Cost to feed for 200 days, on a well-balanced milk ration, about.....	26 00
Straw for bedding, half a ton, \$1.25; labour, feeding and milking, \$3; interest, \$1; insurance, 25 cents; use of stable, 50 cents.....	6 00
Total.....	<u>\$67 00</u>
Winter milk produced, 3,600 lbs. at \$1.40 per 100 lbs., making.....	\$50 00
Manure produced for 200 days, say 10 cents per day.....	20 00
Value of cow.....	\$35 00
Feed, etc.....	32 00
Total cost.....	<u>\$67 00</u>
Value of milk produced.....	\$50 00
Value of cow at end of winter .....	25 00
.....	<u>\$75 00</u>
Value of manure produced .....	\$20 00
Profit on milk produced.....	8 00
Total.....	<u>\$28 00</u>
The comparison of commercial manure is this: Providing \$1,000 are spent in manufacturing manure through steers, the account would stand thus:	
Sixteen steers, fed and fattened, would sell for.....	\$1,088 00
Total cost for feed, labour, interest and expense.....	1,000 00
Balance to profit from beef .....	\$ 88 00
Manure produced from 16 steers, at \$20.....	320 00
.....	<u>\$ 408 00</u>

In this transaction we have \$320 worth of the best fertilizer known in the world, costing nothing, and \$88 bonus for making it, or an entire profit of \$400 in six months from \$1,000 investment, or 40 per cent. in six months. Or this same fertilizer, when applied to the soil and properly utilized in a rotation of crops to produce 280,000 lbs. of milk at 90 cents per 100 lbs., equals \$2,520; or in finished beef, at 5 cents per lb. live weight, \$2,400. The summing up of these results, although seemingly an exaggeration, are yet true from a scientific as well as from a practical basis. I do not believe it is necessary to mention the conclusions that a practical farmer would come to in seeking how he can best enrich the soil to almost an unlimited extent with the least cost. It is undoubtedly a fact that commercial fertilizers can be purchased at a great cost to enrich the soil in the least time; yet the expense per acre would be about \$50, whereas stable manure, properly made and preserved, can be applied to the soil without any cost except on capital account, which would be for stables, siloes, etc., etc.

My strong and urgent advice to all farmers is to build large and convenient stables, sufficient to hold not less than one animal to each acre of arable land, siloes of capacity to hold five tons of corn for each arable acre, and to use the winter to manufacture fertilizers to build up the soil in the summer.

Study well the science of feeding cattle so as to obtain the greatest amount of animal products, in the shape of beef, milk, and manure, at the least cost; study well how to convert these manurial products during the following summer and winter into marketable products, and raise greater values each year per acre, and leave each acre each year in a higher state of fertility. Make progressive fertility in the soil concur with progressive profits, and I will assure you, when this shall be achieved, the land will gradually increase in value, the profits from working it will also increase, population will increase, the young, bright men will remain in the country, as then they will have some prospect of success by staying in it; our country will prosper, and an era of national spirit will prevail to make this Canada of ours the foremost country in the world.

Lancaster, Ont.

D. M. MACPHERSON.

*Dr. Coulombe.*—Mr. Chairman, having been invited by the Secretary of the Dairymen's Association to deliver a lecture before this meeting, I have felt it my duty to accept such a flattering invitation, though with some regret, for, owing to my professional occupations, I have had very little time to devote to this task, so that what I am going to lay before you will be rather the abridgement of a lecture than a lecture in full.

Besides, I had no intention of coming to this meeting to lecture; it was rather with the idea of receiving than of giving information that I made up my mind to come hither, before I received your Secretary's invitation. But since I have accepted it, I will do my best, always with your kind indulgence.

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## FARM

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The subject I have chosen is a rather dry one; still it is not void of practical interest. I am about to speak of "book-keeping," as regards the advantages farmers would derive from it if they were to practise it; unfortunately very few of them understand its importance.

## DR. COULOMBE'S LECTURE.

### FARM BOOK-KEEPING: ITS UTILITY AND ADVANTAGES.

*Mr. Chairman and Gentlemen,*

The farmer, in the management of his farm, has two important conditions to fulfil if he wishes to be successful: 1, By assiduous, wise and enlightened labour to extract from his land the greatest possible produce, while at the same time he conducts all his operations on a systematic rotation of cropping fitted to the preservation of the fertility of his farm; 2, by prudent and judicious management, to employ these agricultural products for the realization of the largest returns in money, without losing sight of the importance of restoring to the soil, by means of complete and properly applied manures, the riches abducted from it in the crops. But, as in the wise administration of a farm and a family, it is not enough to know how to make money, to win ease and prosperity, another obligation is imposed on the farmer who desires to be successful: he must know how to suit his expenditure to his income, and to regularly lay aside a certain proportion of it as savings. How often do we see a hardworking farmer, with a well-cultivated farm and abundant crops, unable to meet his expenses; he has unsettled bills at the shop; he owes money to the professional man, to the tradesman, and his farm is heavily mortgaged; in such a case the cause of the damage is not far to seek; such a farmer is extravagant instead of being economical, and makes debts instead of saving money as he ought to do. An ancient proverb says, "Good conduct is better than hard work;" and I may add, Wisely conducted work and good management are worth gold. The instances, unfortunately but too numerous, of farmers, once in easy circumstances, who have fallen into poverty and trouble from their absurd extravagances of every kind, ought to open the eyes of the farmers, and make them estimate more highly the importance of a wise and economical management of their income.

One of the means most likely to aid the farmer in the sensible administration of his property would be, I think, keeping correct farm-books. Indeed, if we glance at the various classes of society, we shall see that with those who are successful, thoroughly correct book-keeping is an index to the state of their affairs, and acts as the most powerful agent in promoting their progress towards prosperity and fortune. This assistant, so useful to all men of business, is also a vast co-operator in initiating the farmer into the spirit of order and good management, and I should be glad to see its practice more largely diffused among our good *habitans*. They should not grudge the cost of a good account-book, for it is one of the most useful purchases they can



make. In this book one column should be reserved for receipts and another for expenditure. Day by day, cent by cent, the expenditure and receipts are to be entered in their respective columns; every Sunday the financial operations of the week are to be cast up; every month those of the weeks that make up the month; and every year those of the months of the year. This will enable the farmer to find out his exact financial condition at the close of each year.

If a farmer has several children, he ought as much as possible to make each of them, in turn, keep the books, under his guidance; this would be, first of all, a good way of helping the children to retain by daily practice the instruction received in their youth; secondly, it would be the best way of familiarizing them, while still young, with the cost of the things needed in the household, and with the sale prices of the products of the farm; lastly, these children having been constantly acquainted with the state of their parent's affairs, whom they have so greatly assisted in making savings, will be the more industrious, the more economical, and the more inclined towards order and good management, from having acquired a taste for them in their youth.

For, if you look over the purchases of a farmer who keeps regular accounts, I shall be surprised if you find there heavy bills for expensive dresses, or carriages, or for whiskey! In such a family the desire and disposition of all its members tend towards the same end—to live comfortably, though moderately, to develop all the resources of the farm by a wise and well-selected system of cultivation, and to make provision for the future needs of the children.

This farmer, who began with very small means, is now well off; his property increases year by year, and he looks forward to settle each of his sons in a good farm as soon as they are old enough, and to give each of his daughters a fair dowry at their marriage. But the grandest and most important thing for this good father and mother is, that the useful agricultural education they have painfully bestowed on their children, the principles of honesty, industry, order and good management they have instilled into them from childhood, give them reason to trust that they will become good Catholics, good citizens and honest farmers, and that they will be the pride and solace of their parents in their old age.

Book-keeping has a tendency, then, to make the farmer steady, more moderate in his wants, and in that way may greatly aid in lessening among the farmer-class that taste for luxury and inebriety which, it must be confessed, are the two scourges that commit the greatest ravages among our Canadian country-folk. Book-keeping, inducing the farmer to cultivate his land better, will aid in freeing him from routine and lead him along the road of progress and agricultural improvement.

But another very powerful motive that will assist the farmer in farming wisely and profitably, one that may serve as the complement of book-keeping, is the "Journal of the Farm-work."

In this journal may be inserted, first, the divisions of the land as regards the rotation; at seed-time will be entered the quantities of seed-grain and grass-seed sown in each field; at harvest the quantities grown and carried, with remarks on

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the quality of the crop, the cause of success or the reverse, on the experiments made either with manures, in cultivation or in breeding, in order to arrive by these means at the perfection of farming by correcting those errors that may have crept into agricultural practice.

The "house-father" will not omit inserting in this journal those good counsels that may be of use to his children.

This journal will also serve to note any important events that occur in the household or even in the parish. A journal of this sort, well kept, will become a precious possession to the family after some years, and it is easy to see how, like wine, it will acquire value with age; it will be often consulted, and will be preserved as a precious *relique*.

Allow me, Mr. President, in conclusion, to strongly impress on farmers the advisability of trying accounts and the journal of farm-work as means of improvement in cultivation and as aids in their search after ease and prosperity.

#### DISCUSSION OF THE WEIGHING OF BUTTER AND CHEESE.

*The Chairman.*—We discussed yesterday the method pursued by the buyers in paying for cheese. To-day an equally important matter is before us for discussion. It concerns the way in which the buyers weigh the cheese, whether this method of weighing it gives satisfaction to the people who sell it. As the chief buyers of cheese happen to be present, they have an opportunity of replying to any questions put to them, and of giving us such explanations as may satisfy those who are interested.

*Mr. Fisher.*—Mr. Chairman, I beg leave to give a word of explanation to the buyers of cheese who are present. Many makers think they often suffer a loss of weight in the cheese they send to Montreal and which is weighed there by the dealers. This is the question to be discussed this afternoon, nor can there be a better opportunity, since M. Vaillancourt and Mr. Grant, representing the firm of A. A. Ayer & Co., the chief buyers at Montreal, are here. From these gentlemen we can get all the information we need. If any one is ready to start the debate, these gentlemen are requested to take part in the discussion.

*M. Saül Côté.*—With your permission, Mr. Chairman, I will open the debate. I know well enough that the buyers of cheese cannot always accept the weights of the sellers, because it often happens that the scales at the factories are not perfectly correct, and consequently cannot show a correct weight. I think it would be a good plan to have in every factory a certified weight with which, from time to time, the scales might be verified. This would be of importance for the sellers, for it has often happened, and it happens frequently still, that they find the weight of their cheese *cut*.<sup>1</sup>

I obtained a verified weight at Montreal, with a certificate of its verification. Having this in my possession, I can in my tours verify or test the correctness of all these scales, and thus obviate many of these difficulties. Before I got this weight, to

<sup>1</sup> *Couper* in the original.

see, when weighing a lot of ninety cheeses, that the scales were out of order, that there must be something wrong about them; this was perceptible to the unaided sight; for when accustomed to it one can judge the weight of a cheese to a nicety. This, then, was a great inconvenience, for when one arrived at Montreal with a lot of eighty or ninety cheeses, there might be a great discrepancy in weight. I say, then, that it would be very useful to makers and buyers if they had a weight of the same value verified, so as to be able to test their scales. I do not know whether the buyers' weights are correct, but I suppose they are; still there are often great differences in the weighings found, to the loss of the patrons. I do not mean to throw the responsibility of this on any one; I only state what happens. It is possible that in many cases the differences against the patrons comes from their scales not being true, and that is why I think that a uniform weight for both buyers and sellers, *i. e.*, a tested weight which would permit the scales to be tested by it, would be an important thing to secure.

*M. Vaillancourt.*—Interested as I am, Mr. Chairman, as a dealer, in the present discussion, I wish to make a few remarks. First, I do not believe that any dealer wants to get more than his right in his purchases of cheese. He calculates his profits off the buying and selling prices, and not on a diminution of the weight in a lot of cheese weighed in Montreal; but, on the other hand, the sellers must not think they will get paid for 50 pounds of cheese when their goods, as delivered to us, only weigh 48 pounds. I think, Mr. Chairman, that the trouble that arises sometimes between the buyers and sellers of cheese comes principally from the sellers not weighing their cheese in a regular manner. Generally speaking, at the factories the cheese is weighed by any member of the Board of Directors, which of them it does not signify. The maker gets two or three of them together of an evening; each one weighs a cheese; I know they mean to act fairly; but even supposing the scales are correct, this is not a regular way of doing the work, and thus it very often happens that the cheeses are marked as weighing less than they really do weigh; sometimes they are marked too high, and this shows either incorrectness in the scales or carelessness in the weighers. Considering this state of things, we have come to the conclusion that to employ a public weigher, named by the government or by a society formed for that purpose, a man competent and bound by oath even, a man perfectly uninterested in the result of the weighings, would be the best way of doing justice to every one. At present, it is the rule that when a seller with a lot of cheese arrives at Montreal, and that the weight he states he has is not the same as the weight we find, the public weigher is sent for, who gives him all the details he may want, and says: this lot weighs so many pounds, that other a thousand pounds, that one five hundred pounds. So that the seller has no enquiries to make of the buyer, no fault to find with him, since his cheese has been weighed by a perfectly disinterested man.

And as with cheese, so it is when butter is weighed by the makers. For instance, take a tub made to hold 70 lbs. of butter; they put 68 lbs. into it, 2 lbs. short of what it should hold if full, and send it like that to market. How can buyer and seller be expected to agree about the weight? If there is not enough butter to

fill the tub, it is short of weight on account of such and I think that

*M. W. P.* five cheeses at same weight: the mistakes are

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*M. Samuel* a necessity. The knows how to weigh that in the factory



fill the tub, the maker must wait till there is enough, and not close the tub and send it short of weight to market. Still this is done, as I found last year. It is on account of such a state of things that we have decided to employ a public weigher, and I think the plan is a fair one.

*M. W. Parent.*—Could not the cheese be weighed wholesale; taking, for instance, five cheeses at once? I think that would be a good way for the buyers to get at the same weight as the sellers, for it is often by weighing the cheeses one by one that the mistakes are made.

*M. l'Abbé Côté.*—I would ask the buyers if, when they find a pound too much in a lot of cheese, they put it to the credit of the seller, just as, when they find a pound short weight, they debit him with the deficiency?

*M. Vaillancourt.*—This frequently happens.

*M. l'Abbé Côté.*—It has not happened to us.

*M. Vaillancourt.*—That may be because you have never put too much in your tubs.

*M. l'Abbé Côté.*—Nevertheless, we once went and weighed our cheese at Montreal, and on some cheeses, instead of 45 lbs., you only found 40 lbs., while on others, that were rather over weight, we had to come down to your weight.

*M. Vaillancourt.*—It was not I that weighed that lot; but there must have been some irregularity in the weighing by the sellers, and it is this that proves the truth of what I said just now: that in some lots of cheese there are some over, and some under-weight.

*M. W. Parent.*—I, too, have observed that in some salés there are cheeses that weighed a pound too much, and they were not allowed for. If we were to weigh five cheeses in each lot, or ton, we should certainly get at a fairer weight, because the buyers generally say, when they make us deduct anything, that the pound is too light.

*M. Firmin Paradis.*—I would remark here that to rectify the scales it is not necessary for the makers to have certified weights. I think that it would be sufficient to have in each factory a hanging-scales (*balance suspendue*). Such a weighing machine needs no verification; it is recognized as true everywhere. If both makers and buyers have hanging-scales, there can never be any misunderstandings. The cause of the errors we so often meet with in the results of the weighings of cheese by the buyers and sellers is just this: the imperfection of the scales we use. With hanging-scales we could avoid all these inconveniences, all these troubles, and to put this system into practice would not cost those interested anything worth speaking of. I think this is a question worthy of investigation.

*M. Samuel Chagnon.*—In my opinion, Mr. Chairman, a steelyard is by no means a necessity. The only thing required is that the makers employ a weigher who knows how to weigh. I have myself had experience of this. Mr. Vaillancourt said that in the factories the weighing of cheese was conducted in an uncertain manner,



and I think he was right, because I found that when I myself weighed the cheese with the scales that I use every time I weigh it, there was no difference between my weight and the weight of the cheese when it arrived at Montreal. The great thing, in my opinion, is to have good weighers, men who devote their whole attention and care to the work; for there is danger of being deceived in a considerable degree when carelessly weighing a lot of two or three thousand pounds of cheese. When one gets to Montreal with such a lot of cheese, and an error against the makers is found in it, the buyers are naturally supposed to be in fault, while it often is the weighers to whom the blame should be imputed.

*M. Vaillancourt.*—And it is thus we are accused of cheating. I think that, in sober earnest, up to to day, we have been very nearly supposed to be regular robbers. I know, of course, that the difference between the weight marked on the boxes and the weight we arrive at is very often in favour of the buyer. But, generally, who are they who complain? They are those who cannot show the weight they say they have. I do not mean to say it is their fault; but I certainly am not inclined to admit that it is the fault of the buyers.

I was present at a factory last summer while they were weighing the cheese. After watching the working of the scales and the way in which the weights were added up (*chiffrait*), I remarked: "Do you weigh the milk with these scales? How, with such scales as those, can you do justice to the patrons?" The maker replied "that it was very simple; all the milk was weighed on the same scales, so that no one could lose by them. If the scales show 2 lbs. of milk short on a lot sent by a patron, it would do the same, proportionally, on the lots sent by all the other patrons."

Well, they weighed the cheese with these very scales! I ask you, how can they expect to have the same weight as the buyer makes the cheese weigh? I do not mean to say that this occurs in every factory; but I know of this case as a fact, and, at all events, I say positively that there is invariably more or less negligence on the part of the makers, who do not take sufficient care in weighing their cheese. I think the use of the hanging-scales would be an excellent thing. I believe it would be a step in advance and an advantage to every one concerned. In all shops where scales are used the hanging-scales are always the ones that give the best and surest result; it is certainly the best form of scale that can be used, but the buyers must use them as well as the sellers.

*M. S. Chagnon.*—I repeat that the hanging-scales are not needed; good weighers are the essential. But, exclusive of the errors arising from the weighing, there are others that must not be attributed to the buyers. For instance, you weigh a cheese of 70 lbs.; there are exactly 70 lbs. of it, but when it arrives at Montreal, after passing two days or more on the wharf, on the cars or in the boat, exposed to every change of temperature, this cheese will have inevitably lost weight, and you must not be surprised if the buyers will not allow you payment for exactly 70 lbs. If each cheese in a large lot loses half a pound, it would be rather hard to expect the dealers to submit to such a loss.

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*M. J. C. Chapais.*—As to us, we have obviated this inconvenience. Our method is very simple: we sell our cheese at the factory, so that, if we have 70 lbs., we are paid for 70 lbs.; and more, we are paid according to the weight shown by our own weighing.

*M. l'Abbé Côté.*—M. Chapais might have added that his factory is very far from Montreal; in fact, a hundred miles below Quebec; and if he has obtained this privilege for his factory, it is very clear that other makers, much nearer Montreal, might ask for the same thing. When we have goods to sell, it is very certain that we have a right to demand that the buyer shall accept delivery and pay for them on the spot where we sell them. When we go and buy goods at any shop, it is not the custom, if we buy for cash, for the shopkeeper to come to our home to be paid; and we feel that it is quite fair that we require payment to be made at the place where the goods were sold to us. I see no reason why the same rule should not be applied in the cheese-trade.

*M. Vaillancourt.*—Will M. l'Abbé allow me to point out that this is not the practice in all branches of trade. Take the case of a merchant in a large way of business; he gets his goods from, perhaps, Upper Canada, from the Maritime Provinces; his place of business is at Montreal; this is the invariable course pursued: when the goods arrive at Montreal, and only at that moment, the seller draws on the Montreal merchant. This is the way in which every branch of wholesale trade is conducted, and I do not see why more should be required from the dealers in butter and cheese than from any other wholesale merchant. It seems to me that we are exactly in the same position as other wholesale men.

*M. l'Abbé Côté.*—I understand how the dealers in cheese find it to their advantage to buy and make their payments in this way. Still, I must congratulate M. Chapais at having succeeded in selling his cheese at home; I think it was an excellent way of consulting the interests of his patrons as well as his own interest.

*M. Vaillancourt.*—Well, I fancy that Mr. Chapais' case is exceptional, and that it has not been long in existence.

*M. Chapais.*—You are wrong, Sir; it is seven years since we instituted the practice.

*Mr. H. W. Walker,* who spoke in English, observed that, on account of the numerous causes of mistakes that exist in the different ways of weighing cheese, it is very difficult for the dealers to satisfy the makers. In many cases, the makers accuse a buyer of an alleged loss of weight in their cheese, while they themselves are the cause of the error.

A pound of cheese containing 16 oz. of cheese, neither more nor less, it is very difficult for a buyer to find exactly 16 oz. to the pound, when the cheese has been frequently weighed in an irregular manner by the sellers, and, before its arrival at the market has necessarily suffered some diminution in weight through the variations of temperature it has been exposed to during its journey. However that may be, I think we do not use the best scales for weighing cheese, and there should be a uniformity in the weighing machine used by both buyers and sellers.

It would be an excellent thing if Mr. Macpherson, who is a large dealer and a member of the Chamber of Commerce, would give his opinion on this subject.

*M. Vaillancourt.*—Mr. Macpherson is a large exporter of cheese; I do not think he pays for 50 lbs. when there are only 40 lbs. But, as he has been dealing on a large scale for many years, he must be pretty well skilled in the best way of weighing cheese, of which he exports a very great quantity, and though on a greater scale, his trade is similar to the trade of our sellers of cheese. How do you sell your cheese, Mr. Macpherson?

*Mr. Macpherson.*—I am like the greater number of buyers, in that I often have a discrepancy in weights. Besides, cheese is generally a substance susceptible of diminution in weight, so that, when a large lot of cheese is sent to a great distance there must, of necessity, be a difference in the weights. The different modes of weighing do not agree, or, rather, the weights are not uniform; the weights used in Montreal for weighing cheese are not the same as those used in England, and this naturally causes errors to occur in this sort of commerce.

I hold that it is necessary to establish a uniformity of weights in the butter-and-cheese-trade, and I think, moreover, that the only way to secure a correct, uniform weight at the warehouses of all the dealers, is to have a *regulator*.

*Mr. Barnard.*—I think that the word *uniform* is thoroughly explanatory of Mr. Macpherson's idea: he means to say that we should have a weight, a system of weighing, that should be the same at the factories and at the warehouses. This would be the first thing to settle. Then both buyers and sellers must agree upon the way of fixing the weight according to the exact position of the beam of the scale, so that, when the beam shows an overplus of a quarter of a pound, this overplus should be credited to the seller. This, I believe, is done in Ontario. People are satisfied by allowing a diminution in weight, when it is caused by the length of transit, and the weight is found by the real inclination of the scales.

*Mr. Macpherson.*—We weigh five cheeses—suppose four of them weigh  $60\frac{1}{4}$  lbs.,  $60\frac{1}{2}$ , or  $60\frac{3}{4}$ —if there are not 61 lbs., we set down 60 lbs., as we do not reckon fractions of a pound; but, if the fifth cheese is full weight, if the beam is straight or level, we allow an extra quarter-pound on that cheese.

*M. Taché.*—Mr. Macpherson does not seem to approve of the usual manner of weighing, as he lays stress on the exact position of the beam. If this plan is fair it ought to be accepted by everyone.

*Mr. Barnard.*—It is clear that the system of weighing by buyers and sellers is not the same. Both naturally consult their own interest. That is why I think it necessary that the dealers and makers should agree on a uniform system of weighing; the same system to be followed in the factories, and at the warehouses in Montreal.

*Mr. Macpherson.*—Is there not already a uniform system of weighing in Montreal?

*M. Vaillancourt.*—There is at Montreal an association of the dealers in butter

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and cheese, of which I am vice-president. It is with this corporation that I think we ought to consult first of all. The president and I have already proposed to discuss this question in the board of directors. I will put the matter before the board as soon as possible, and we may probably arrive at some understanding on the subject of the method of weighing.

*The Secretary.*—Would you kindly let me know the result of your consultation.

*M. Vaillancourt.*—Oh, certainly; with pleasure.

*M. N. E. Clément.*—Would it not be as well to appoint a delegate from each syndicate, to concert measures with the board of directors of the butter-and-cheese trade of Montreal. These delegates representing their own interests would be able to discuss the question to our greatest advantage. I am speaking of a member of each syndicate, who would represent the interests of his own district. I think the question should be discussed, and that we may derive great good from its adoption.

*Mr. Macpherson.*—I think M. Clément's idea is a good one, but that a special committee appointed by this meeting would be still better. You might appoint a delegation by a special resolution of this convention, to consist of men able to give full information on the subject to the board of trade.

*M. Vaillancourt.*—It would be right, in my opinion, to interest in this discussion the members of the Chambre de Commerce of Montreal. They represent the general trade of Montreal, and would have a word to say on the subject of weights. The Chambre de Commerce, in concert with the board of trade in butter and cheese, might listen to the representations of our committee and thence come to a satisfactory solution of the question. It would be as well then to address the secretary of the Chambre de Commerce of Montreal, naming the day on which our committee would attend. There is no doubt that that body, composed of all the dealers in cheese and of all the principal merchants of Montreal, will be inclined to give us satisfaction, when it shall have been invited to give its opinion, after having listened to all the information that the delegates of this convention shall have laid before it.

*M. Clément.*—I propose that Mr. S. A. Fisher, M. William Parent and Mr. H. W. Walker, form part of this committee.

*Mr. Fisher.*—I must tell you that I am not accustomed to this sort of business; I have never done business such as the makers do; I have never had to complain of the buyers, therefore I am by no means competent to act in this affair. But it is my firm opinion that what we have to do is to appoint a committee to take this subject into consideration, and to submit its report to this convention either this evening or to-morrow. It would be better, I think, that the resolutions of this committee be adopted by this convention, rather than that the committee should go to Montreal without the regular approval of the plans that it will have to submit to the members of the board of dealers in butter and cheese, and to the members of the Chambre de Commerce of Montreal. A resolution passed by the convention of the Dairymen's Association would have much greater influence in Montreal than if it proceeded from the committee alone. The members of the committee would consequently have



much more authority, being supported by a former and explicit resolution on the part of all the members of our convention. But I decline to form part of this delegation on account, as I said before, of my want of practice in this sort of business.

It was proposed and carried, that MM. Veilleux, Fisher, Parent, Walker and Clément, form a committee to study this question.

*Mr. Fisher.*—I am perfectly willing to form part of the committee of enquiry but, once more, I decline to be a member of the delegation. It is understood, I suppose, that the committee is to present a resolution this evening or to-morrow.

AFTERNOON SESSION OF WEDNESDAY, DECEMBER 6TH.

### PROF. JAS. W. ROBERTSON'S LECTURE.

*Mr. Barnard.*—Mr. Robertson told us that he would have inserted in the report of our meeting the different tables he exhibited before us. In order to enable those members of our association who do not understand English to benefit by his lecture, I hope he will let us have a French translation of it, to be inserted in the report. He might arrange with M. Chapais to make this translation at once, so that it may be ready when our report goes to press.<sup>1</sup>

M. Dallaire, having been requested to give a lecture, replied as follows:—

#### ADDRESS OF MONSIEUR DALLAIRE.

*Gentlemen:*

Most of you, at least, have often heard me speak. To-day, I had no intention of delivering a lecture.

You know what is my procedure in my lectures; I try chiefly to diffuse throughout the public the lessons of experience I have gathered from the best farmers I have met with, and whom I have the most frequently consulted in my tours. From these numerous lessons I strive to extract such information as shall turn out the most beneficial to those who take the trouble to put them into practice.

To-day, I intend to be simply one of the audience. I came hither to learn, for it is not before a meeting like this that I should dare to speak on agriculture and to present for your acceptance novel ideas. You will forgive me, then, if I do not speak at length on the present occasion. Once for all, I am only doing what I think is my duty; I am trying to learn something so that I can relate with much pleasure to all our rural compatriots what I have learnt from the things that have been discussed in this great convention of the dairy-industry of the province.

<sup>1</sup> Mr. Robertson not being able to furnish us in time with certain supplementary notes and the tables that illustrate his lecture, it will be published at the end of the report.—E. C.

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I see, this year, with much pleasure a much greater number of farmers present at this meeting. And so I am convinced that, with the present organization of the Farmers' Clubs, the greater part of our compatriots will reckon on the return of the season of agricultural lectures to obtain their shares of the essays that have been delivered at this meeting; to obtain their share of the grand ideas, the novel ideas, that have been promulgated in it.

I will not detain you any longer to-day, but bid you farewell till we meet again. We will talk about what has been said here at some future time more or less distant.

*M. l'Abbé Chartier.*—I do not intend to make you a speech, only I have a remark, a suggestion to offer you.

As we must now find means to make our cows pay for their keep during winter, perhaps it would not be inopportune to profit by this very numerous assemblage to pass a resolution in favour of inducing a greater number of farmers to grow such fodder-crops as are best suited to produce milk in winter.

#### RESOLUTION TENDING TO ENCOURAGE THE PRODUCTION OF GREEN FODDER-CROPS.

*M. l'Abbé Chartier*, seconded by *M. Chapais*, proposed the following resolution :

1. That dairying cannot be thoroughly prosperous unless farmers have, besides the best pasturage, an abundance of green fodder ;
2. That feeding our milch cows during the seven months, or so, that their wintering lasts, cannot pay unless they are made to yield plenty of milk ;
3. That this yield of milk can only be made economically by means of sound green fodder, well preserved, either by ensilage or by other equally profitable methods.

The Dairymen's Association, in its annual convention of 1893, *resolves* : That the directors of the Farmers' Clubs and the Agricultural Societies should encourage by special prizes in every parish in the country, if possible, the growing of those green fodder-crops that succeed best in their respective localities.

*M. Chapais.*—It is with pleasure that I profit by this opportunity of making a few remarks on this subject. The resolution proposed by *M. Chartier* is a very important one, as regards the production of fodder for the feeding of cows during winter.

For many years it has been the practice to give prizes for animals; and to make use of the expression of a writer, who has published a remarkable book on agriculture and dairying, *M. Richard*, of Cantal, prizes have been given for the effect, without being given to the cause that has produced the effect. Prizes are offered for cattle, and we forgot to encourage another branch of agriculture, the cultivation of plants.

In dairying, it is acknowledged that dry fodder such as is generally used in this country is not what is wanted. We need green fodder—and when I say green fodder, I mean not only the grasses, but also the root crops, which, as you all know,

cause the cows to yield plenty of milk. In this category are included turnips, mangels, carrots, maize, and a number of other plants that pay to grow.

It is evident that it is by entering resolutely on this path by means of the Farmers' Clubs, that we shall succeed in showing the farmer the usefulness of this system of cropping; we know by experience the powers of the Farmers' Clubs by the progress they have already caused agriculture to make.

If we obtain the support, the encouragement of the Farmers' Clubs and the agricultural societies, we are certain of succeeding in a fairly short time in the end we propose to ourselves: the improvement of dairying by the cultivation of the sorts of fodder best suited to the production of milk in winter.

It is therefore with the greatest pleasure I second M. Chartier's motion, and I am heartily glad to see that all the members of this meeting seem to approve of it, and to understand how important it is that this resolution be passed unanimously.

But would it not be well to ask the Council of Agriculture, the proprietors and patrons of the cheeseries and creameries, to concur with us in pushing the realization of our object? With this view, I submit to you, as a corollary of M. Chartier's proposition, the following resolution:—

#### SECOND RESOLUTION IN FAVOUR OF THE PRODUCTION OF GREEN FODDER-CROPS.

*Resolution 2.*—The Dairymen's Association, in addition to the previous resolution, resolves:

That the Council of Agriculture, which has the superintendence of the agricultural societies and farmers' clubs, should be supported and aided by all interested in the matter, patrons, makers and proprietors of factories, to the full extent of their power, in the means it has taken, or shall in future take, to increase the production of the green fodder-crops best adapted to ensure an abundant production of milk both in winter and summer.

Both resolutions were carried unanimously.

*Mr. Barnard.*—I am happy, in my quality of secretary of the Council of Agriculture, that the convention has passed these resolutions with unanimity. I know that the Council is very well inclined to promote all the measures taken by the agricultural societies for the advancement of the interests of agriculture: "Whoso desires anything, will find the means to win it." (*Qui veut la fin veut les moyens.*)

And the clubs and agricultural societies being under the immediate direction of the Council of Agriculture, the Council, as far as possible, establishes a rule of conduct for them in the public interest; but, if the public is not prepared to second it, the Council is naturally less inclined to act. An association like this of ours, like the Dairymen's Association, comprising the most authoritative representatives of all parts of the province, may greatly influence the public mind; and I think it is an excellent way of seconding the work of the Council in the promotion of progress, to pass resolutions of the character of those which have just been unanimously passed.

*Mr. Chairm*

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## LECTURE BY M. L. T. BRODEUR.

*Mr. Chairman and Gentlemen :*

As you have been addressed this morning by several persons in English, and as there are among you more people who do not understand that language than people that do understand it, I hope you will be indulgent to me who am about to address you in French.

We have heard several lectures since yesterday; all the lectures seemed to say that dairying in Quebec has attained to the highest possible degree of progress. This I take as a compliment, as an encouragement to all those who are interested in farming and dairying. There are, however, many other branches from which profit may be derived, and I propose to submit to you some observations which may be of service to many among you. There are still some backward farmers with us, who may perhaps derive as much profit from what I am about to say, as from the learned lectures they have just listened to.

I heard Mr. Macpherson's address this morning; I do not understand English well, but I felt convinced that, if all the scientific information he gave us was within the reach of every one, lecturers like me would not be needed to interest you. But, as I said, there are always those who have not reached the limit that progress can attain, and it is for their sakes that I am going to speak.

In travelling along our roads, you have observed (when you have had time, and were not too busy about sending your horse along at full trot) that we allow a great part of our wealth to be dissipated round our buildings.

We, farmers, have all of us a mine of wealth to be worked. (I see almost all those who call themselves farmers asking themselves: What is he talking about, when he says that we have, all of us, a mine to be worked?) This mine, my friends, is our milch cows. In my opinion, indeed, when I look at the profits that might be derived from our cow, it seems that she is not generally the source of such profit to the farmer as she might be. From my own experience, I believe that as things are at present, dairying does not represent to the farmer more than half the revenue it ought to yield. I am certain, for my part—for I am a farmer myself, as much as, and perhaps more than, any of you—I am certain, I say, that if we calculate the revenue derived from dairying alone, without including the value of the dung, we cannot brag of the great profits we derive from our farms. I reckon that of the profits derived from dairying, one-half only constitutes a revenue for the farmer, the other half I apply to the improvement of his land.

You were shown, by very lucid tables, the difference between the value of the solid and of liquid digestions of cattle. You must have observed that the liquid part is indisputably much more valuable than the solid part. Now, I ask you, how many farmers are there who do not allow this liquid part—the urine—to go to waste? Ninety-nine out of a hundred do so. This is, however, a matter of great importance, but, there is no disguising it, we do not appreciate its importance. We cannot hide



it from ourselves (though we carefully hide our mixens behind the stables and cow-sheds, near the roadside ditches, whence the juice often runs off and benefits our neighbour); but we cannot deceive ourselves in this; most farmers do not know how, or have not the pluck, to take the more simple means to force the land to yield its full profit.

There is, however, a very easy plan, and many of us already have dung-pits; others are prudent enough to build a good dung-heap before their cowhouse-door; but there are few who have foresight enough to make a tank of any kind to contain the urine. Last fall, I was lecturing at St. Denis, on the Richelieu; I was told that the people of St. Denis were anxious for information; I found, though, that the St. Denisians fancied they were no more in need of information than other people; still, they were very much surprised when I spoke about the way in which they ought to put to profitable use the dung they were in the habit of leaving at the door of their cowhouses.

I advised them to take out a board or two at the back of the cowhouse, behind the cattle, and to place a lad under it while the drainage is going on, so as to lead the urine into one or two places. This is easily done, for there is many an opportunity in winter. And thus they will have a fine heap of manure in a hollow place before the cowhouse door. Then, some one should be sent into the cellar to collect the urine and to scatter it over the mixen once or twice a month. When this has been done, and it is but a trifling piece of work, and they have come to find the advantage of managing their manure in this way, instead of leaving it in future under the eaves, they will begin to calculate how much they must have lost in the past. They will improve their buildings, if their present ones are not suited to this system. If their buildings are new, they will make a dung-pit. I am convinced that a man, who has once tried this plan, will go on with it the next year and ever afterward.

I ask you if everyone of you is not prepared, even if it is only for the encouragement of agriculture, to make these little improvements? I say, even if it is only for the encouragement of agriculture, because, even if you do not gain by it personally, it is so easily done, that I am inclined to hope that no one of you will decline to make a trial of it.

As you see, I am speaking to you about things easily done. Let one of you try the experiment, and it will appear so easy, that you will soon be imitated by one, two, three or more farmers, who, in their turn, giving an example, will induce the majority of your co-parishioners to follow out the system. If you only make one slight improvement a year, beginning with that I have just pointed out, *i.e.*, by utilising the manure which is mostly wasted in the rear of your cowhouse; in another year you will make another improvement; if the farmers in every part of this country would agree to make one improvement every year, in ten years the province will have undergone a complete transformation.

Mr. Robertson told you that agriculture in this province was making a great deal of progress; but can it be said that much progress is being made, when one

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sees the majority of farmers ignorant of the more elementary things? I made an experiment this year; it is not one of much importance, still, I will relate it to you. I am, very probably like many of those talkers, who seek to instruct others and do nothing of the sort; but, at any rate, I made an experiment, a profitable one, and I want you to profit by it too.

Last spring, at St. Hugues, where I farm, was early and rainy; the grass began to grow fast, and we began, for one reason or other, to get fidgety, to fear that we should not be ready to sow in good time, that we should be late in sowing our silage crop. Not that, as I will explain later, there were many people who were sufficiently interested to dread being late in sowing for silage, still there were some.

As for me, I had some maize stubbles, thoroughly manured, and sown with clover (ten to twelve pounds an arpent), Vermont and western kinds; this came away early and abundantly; it was fit to cut by the 10th or 15th June, perhaps earlier. I wanted to make silage; I cut five arpents of clover, passed it through the chaff-cutter, and ensiled it. The work was simple enough; I cut it with the mower; a man got it together; when cut, I carted it to the silo, chaffed it, and put it into the silo in layers two or three feet deep; of these I put four into the silo, and twenty-four hours afterwards, I began the same operation anew. As I was afraid I had not ensiled my clover in the best condition for fermentation, I added a pail of water (*to each layer? Trans.*) to prevent its too rapid fermentation. Here is a sample of my first crop of clover; you can judge by it of the success of my experiment.

This clover I ensiled to a depth of about 7 or 8 feet, 12 feet wide by 7 long. After four days, I found it was still *boiling*; I wanted to experiment for my own satisfaction, and to push the trial to its extremity, so I put six or seven pails of water on my silage (nothing can be simpler, as you see, for every one has water); I trod it down properly, stopped all the cracks in the frame, and left it to itself.

I had decided to use the second crop to fill up my silo, so I gave some of this silage to my cows, as much as I could, and when the maize was ready I filled up my silo with it, after having taken off the straw (about two inches) that I had put on as a cover. The silage from the first cut of clover enabled me to feed my cows so well that they gave nearly twice as much milk as they would have given without it.

As you know, there are not many here who make ensilage. I am ashamed to say it, but at St. Hugues there is only one farmer besides myself who makes it; it is truly to be lamented, but at St. Hugues, and in all the other parishes of this county, the importance of ensilage is not understood; I have not yet succeeded in demonstrating it to my neighbours in a sufficiently clear and precise manner. Still, you see from the results, which results will be much more clear when I give you the figures of the yield of my cows, you will see, I say, that I am not deceiving myself in saying that ensilage is the only way by which dairying can really be made to pay. As long as we persist in only growing hay, and grass for pasture, buying bran for the cows from the dealers, so long shall we only reap trifling results. Dairying will not

beco me profitable, except on condition of our producing an abundance of green fodder-crops to feed our cows on in winter, aye, in summer too.

I return to my silo. When I had finished ensiling my maize, there were two feet, in depth, of space left. My maize was finished. I went back to my clover field, and mowed the second-cut clover from two to three feet in length; this may seem to you an exaggeration, but the piece lay alongside of the road, and all passers-by might have seen it. I treated the second-cut clover just as I treated the first, I trod it down in the silo, covered it with sawdust, tramped it properly and left it to itself. A fortnight afterwards, it was not the time to dry off the cows, as the buyers were offering 11 cents a pound for our cheese, so I put my cows again on silage. I used the silage all the winter, and if I had sent all the milk my cows gave to the dairy school at St. Hyacinthe, I would ask the directors to say if I had succeeded—yes or no!

At any rate, I can tell you that from the first of last January to the first of this December, I have sent to the St. Hyacinthe dairy-school, and to my factory at St. Hugues, milk, the produce of sixteen cows, to the value of \$79.70; and I do not doubt that by the end of the month I shall arrive at \$800. Is it not true, then, that I am right in saying that ensilage is the best, if not the only way, to make dairying pay?

Now, I must profit by this opportunity to ask Mr. Barnard's pardon, in that he found me incredulous when, some years ago, he told me that a cow could make a return of \$25.00 a year. I am still the same man who manifested so much incredulity; I am not metamorphosed, but I can say that I have metamorphosed my cows, or rather that they have metamorphosed themselves, since instead of \$25 a cow, I find that \$50 is not yet the maximum return a cow can make. And I believe that there are several men in this meeting who could tell you that, in reality, \$50.00 a year is not a great return from a cow. You will understand that easily enough when I tell you that I have arrived at the results I have mentioned in spite of having been very often absent during the year; for many of you know that I am alone in my house, very completely alone, and so, when I am absent there is no one to look after my business; and I am very often absent, as I said just now; polite little invitations are sent me now and then, and I feel obliged to accept them, though, in truth, these invitations make me lose a good deal of time, and I am persuaded that I should arrive at still better results, were I to remain always at home to look after my business.

I am then convinced, and I say so boldly, that a farmer who has a family and brings up his children with industrious habits, can do no better by them than give them an agricultural education, to prepare them to thoroughly understand the things most necessary to the profitable carrying on of the business of dairying.

I was a long time before I could determine if one could live by farming. When I say *live*, I mean live independently and at one's ease. Now, I am satisfied that one can not only live but also make a fortune by farming as well as by any profession whatever.

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I have done; but I must profit by this opportunity to thank all those present who seem to feel such a lively interest in the progress of dairying in this province. As for me, I should feel happy if the few experiments I have submitted to your notice turn out profitable to some of you; for I feel certain that the success you meet with will be the best encouragement you can give to your people, who do not accept the demonstrations that are annually placed before them by the agricultural lecturers.

#### REPORT OF THE COMMITTEE FOR THE EXAMINATION OF THE SAMPLES OF SILAGE.

The samples of silage sent to the convention were brought in for examination by the meeting.

The committee reported that there were 13 samples; 7 of maize, 3 of Robertson's Mixture (maize, horse-beans, and sunflower heads), and 3 of clover. These were classified as follows:—

*Maize*: 1st, No. 4, M. T. L. Brodeur; 2nd, No. 12, M. Belhumeur.

*Robertson's Mixture*: 1st, No. 9, M. Arsene Gatien; 2nd, M. J. E. Plamondon.

*Clover*: 1st, No. 13, M. Frs. Chapdelaine; 2nd, No. 11, M.L.T. Brodeur; and 3rd, M. L. T. Brodeur.

#### REMARKS BY MR. FISHER.

In several of the samples of the "Robertson's Mixture" I observed a paucity of beans. The maize was present in plenty, but very few beans; this is a pity; we ought to alter this, to grow more beans, for, used in silage, beans tend greatly to the production of milk.

Here, is a sample of maize silage that is not good, it is sour and spoiled. The maize was not mature enough when ensiled, in which state it should be dried before ensilement. Here, is another sample which was also ensiled before maturity. When the plant is sufficiently advanced, it does not need drying; it can be ensiled at once; but when it is cut in the green state, it must, positively, be dried.

Will M. Chapdelaine please to tell us how he made his silage?

*M. Chapdelaine*.—I followed the advice of my friends, of M. Côté among others. I made my silage in July. The spring was rainy, and I saw by the beginning of July that I should not have maize to fill my silo. I had plenty of pasture, so I determined to mow my clover, chaff and ensile it, which I did by the middle of July. I ensiled the clover, watering it, and finishing it properly, but how much water I put to it I do not know. It was properly tramped, five men being employed for that purpose. I was advised to put boards or six inches of sand on it, so I, at first, put two boards as a cover.

I opened my silage in November; it had sunk three feet, and about one foot of the top was spoilt owing, I think, to carelessness; some air must have got in. I put another cover on, for the first had sunk down, the boards had deflected, and some of



them split. This, I think, was the cause of the injury the upper part of the silage had suffered.

I did not find that my cows gave me any remarkable yields of milk while on this silage.

*Mr. Fisher.*—What yield did they give before?

*M. Chapdelaine.*—I cannot tell exactly. I had been giving them clover, and I do not keep a strict account of what I give the cows.

*Mr. Fisher.*—How many cows had you on this silage?

*M. Chapdelaine.*—Fifteen.

*Mr. Fisher.*—What is the interior measurement of your silo?

*M. Chapdelaine.*—Fifteen by twelve feet.

*Mr. Fisher.*—And in depth?

*M. Chapdelaine.*—The silage was twelve feet in depth before sinking.

*Mr. Fisher.*—How many arpents of clover did you mow?

*M. Chapdelaine.*—Four.

*Mr. Fisher.*—Five men tramped it, you say?

*M. Chapdelaine.*—Yes; I had not much experience in this work, and I thought five enough.

*Mr. Fisher.*—How many pounds of clover seed did you sow to the arpent?

*M. Chapdelaine.*—Five pounds.

*Mr. Fisher.*—How many tons of green clover did you cut to the arpent?

*M. Chapdelaine.*—About one ton.

*Mr. Fisher.*—Was this the first cut?

*M. Chapdelaine.*—It had been mown before in previous years. I had left it down, and when I mowed it last year the clover was in bloom.

*Mr. Fisher.*—Was it all red clover? Was not there some melilot, or "sweet clover" among it?

*M. Chapdelaine.*—Yes, there was some growing among the clover; but I only sowed red clover.

*Mr. Fisher.*—When clover is sown alone, without grass seeds, 5 lbs. an arpent is not enough, and the melilot grew, probably, because the clover stood too thin on the ground.

You ought to have had a ton of clover hay to the arpent if you let it stand till fit. Clover cut green should yield at least 5 tons to the arpent of green meat. I should like to know if the melilot makes good silage. If so, it might be cut when young, for silage, and thus be made useful; whereas, up to the present time, it has always been considered as a weed. (1)

(1) M. l'Abbé Choquette, of the Experiment Station, St. Hyacinthe, sends us the following analysis of M. Chapdelaine's silage: Ensilage composed of hay, alsike clover and white melilot: Albuminoids, 2.71; fat, 1.25; fibre, 10.42; carbo-hydrates, 10.36; total solids, 22.20; water, 71.80; total, 100.

Economical value of this silage, \$4.04 a ton. An average ton of maize silage is worth \$2.17.—E.C.

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Did you dry this clover before carrying it?

*M. Chapelaine*.—No, we carried it at once to the silo.

*Mr. Fisher*.—And then you chaffed it?

*M. Chapdelaine*.—It was put into a heap, and the fermentation began at once. The dew was on it when carried, and it was damp; I was afraid we were wrong, but it was carried in that state.

QUESTIONS PUT TO M. BRODEUR.

*M. Philius Veilleux*.—Will M. Brodeur be good enough to tell us what quantity of fodder he gives his cows.

*M. Brodeur*.—I mixed it at the rate of two-thirds silage with one-third of other stuff.

As I said just now, my silage was made of half maize, half clover, so that I began to feed with the maize.

I generally give three cheese-boxes full of silage to two cows, two large cows, in the morning, and two boxes at night. I have two sorts of cows; to the common sort I give one box at each meal. To this I add about three pounds of bran, and I prepare the silage for the evening in the morning, and *vice versa*, so that it is always ready 12 hours in advance. In addition, each cow gets a good warm mash night and morning, and a trifle of chaffed hay at noon. I am very well pleased with this system of feeding cows.

*M. Veilleux*.—How many pounds of bran do you give each cow?

*M. Brodeur*.—About three or four pounds, night and morning, and the two warm mashes.

*M. Courchesne*.—You said you had made silage of the first and second cut of clover. Do you recommend that as a good system for the preservation of the fertility of the soil?

*M. Brodeur*.—Decidedly so; and for the carrying on of the dairy business, too. I did not say I put the whole of my second cut into the silo. I mowed what was wanted to fill up the silo, and I then reserved about two loads for seed. (1)

*M. Courchesne*.—As regards the conservation of the fertility of the soil, would it not have been better to have left the second cut on the ground than to carry it off?

*Mr. Barnard*.—But, if that crop of clover when consumed by your cows gave a lot of good dung to manure your land with, would the land have been impoverished?

*M. Courchesne*.—I do not think you can, even with dung, restore to the land what you take from it in crops. I hold that the second crop you should leave on the ground. I found that by taking off the second crop that the succeeding year I got 100 bundles less. The first year I had 375 bundles, and the next 275.

*Mr. Barnard*.—Did you manure sufficiently, since you assert that you suffered a loss of 100 bundles of clover on your crop the following year?

*M. Courchesne*.—It was timothy I sowed.

(1) This, I presume, means that about two loads were left to stand for seed.—A. R. J. F.

*Mr. Barnard.*—We are talking of clover, and you of timothy; they are not the same by any means.

*M. Courchesne.*—It was clover and timothy mixed.

*Mr. Barnard.*—When did you cut it the first time?

*M. Courchesne.*—At the beginning of July I carried off a little of the second cut.

*Mr. Barnard.*—You can take your choice of two things; either you lose your dung by leaving it at the door of your cowhouse, or you carry your second cut of clover for your cows and take care of the dung they produce from it. If you have dung enough to restore to the land the fertility you remove from it, your clover crop of the following year will be as good, and your land none the worse. Spread the dung, plough in the fall, if the piece is foul, and you will preserve your land in perfect condition, while extracting from it the maximum of production it is capable of yielding. If you carry off your second cut of clover to give to three or four extra cows during winter, you will have, in the following summer, 10 to 15 extra loads of dung to put on. This dung will have cost you the second crop, which will have fed three or four cows, and thereby given you a good lot of milk, and therefore of money. We used formerly to have cows that never paid for their keep, but that is no longer the case; it is settled that cows must pay for their food, and if formerly \$25 was the maximum of a cow's production, nowadays, as Mr. Brodeur says, \$50 is not too much to expect, and we may hope to reach \$75. It is clear that to arrive at such a result, we must grow the best kinds of fodder.

*M. Brodeur.*—I must ask Mr. Barnard to pardon my saying that I do not think I ever boasted before him of being ambitious of making \$75 a cow; I do not think I ever named that sum.

*Mr. Barnard.*—Well, my memory for names is bad, but generally I have an excellent memory for striking things that are said before me at a meeting. You made a capital speech on that occasion, in which you made a good many remarkable statements, but to-day you may have forgotten them. Among them, I remember well that you said that \$75 might be derived annually from a cow, and expressed your surprise at the progress made when, looking at the past, you remembered \$25 a cow was looked upon as a large return. But, to return to my subject. I was saying, just now, that the first thing to do to make as much milk as possible, is for the farmer to grow as much fodder-crops for silage as he can, and that this he can not do if he wastes the good clover by using it as manure. If this is done, it will very often happen that you will be short of fodder in the winter, when you will infallibly regret the crop of clover you left on the land.

If you mow your second crop clover in good season you have a clover that possesses all its goodness, just equal to the first crop. If you are not careful, it may lose its quality, for at that season, when the second crop is ready, it is often raining and the temperature changeable, so that it takes a great deal of care and foresight to make the second cut as full of quality as it should be.

*M. Courchesne.*—I do not know how things are done here, but I have made this

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*Mr. Barnard.*—I should not go is opposed to a meadow prod without exhan cally, but simp from the Cham you that, with a length of tim from it now th South side of C land must posit crops. Now, a of the second c all the nitroger done; and then that you preser up for fifteen y

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*Dr. Grignon.*—The greatest importa industry, which dairying that I recommend grov county we cann ourselves above



experiment at home. I left my second cut on the ground, and at the end of ten years I got as much hay as I did the first year. Again, a farmer, coming from Montana to settle near us with a few thousands of dollars, bought one of the inferior farms of the district. He would not keep any stock, but set to work to grow hay on as large a scale as he could manage. Following this system of leaving the second crop where it grew every year, he sold hay to a larger amount every season, and the hay crop he now grows, instead of having diminished from what it was at first, is actually larger. Instead of a few thousand bundles of hay he used to cut there, he for the last few years has harvested from 10,000 to 20,000 bundles.

It seems to me that this is a proof that the system is not ruinous for the land.

*Mr. Barnard.*—The principle you affirm, sir, is one that it is most important should not go before the public without a protest on our part, for what you maintain is opposed to all the rules that govern good farming. You say that you can make a meadow produce the same quantity of hay during an unlimited number of years, without exhausting the land. I will not demonstrate that this is an error theoretically, but simply ask you to inquire about it from the farmers of the South shore; from the Chambly farmers, for instance. I defy you to find one who will not tell you that, with this system of leaving the second crop on the ground, every year, for a length of time, he has not so impoverished his land that he can get no more hay from it now than about one third of what he used to cut formerly. The farms of the South side of Chambly, especially, are, however, rich, but you must understand that land must positively regain, in some way or other, that which it yields up in the crops. Now, as a restitution to the land, as manure, I do not say that the hay alone of the second crop is worth nothing, but it by no means suffices to restore to the soil all the nitrogen it loses annually. It is only with good manure that this can be done; and then it is to be understood, is it not, that you are not serious in saying that you preserve all the fertility of the land by this treatment, without ploughing it up for fifteen years?

Again, I can give you the testimony of all those who, from ignorance or carelessness, have neglected to put in practice the methods inculcated by agricultural science. Doubtless, there are different qualities of soil. I dare say your land at St-Barthélemy, as M. Brodeur says, is very good, very fertile; but, believe me, besides that the treatment you prescribe does not afford you the most satisfactory results as regards dairying, your farm cannot but suffer by its practice and become poorer and poorer every year.

*Dr. Grignon.*—A most interesting discussion, this! It is, indeed, a matter of the greatest importance, I will say absolutely essential, to know, as regards the dairy industry, which of these various methods to pursue, for it is always the interests of dairying that I must talk about. With us, in my county, we grow clover—I always recommend growing clover. We have farms fit for hay and wheat, but as in our county we cannot compete with the western provinces, I think we ought to devote ourselves above all things to the growing of fodder crops. This is what I never



cease instilling into the minds of my people. In my opinion, it is a positive fact that the future of the province of Quebec depends upon the successful carrying out of the dairy business, and we must, therefore, take all possible means to promote it, putting into it all our efforts, all our energy. With us, as I just said, we sow clover, and we believe this to be the best way of getting plenty of milk from our cows. We feed them on it both in winter and summer. I do not think a man who spends fifty or a hundred dollars in building a silo could make better use of his money. I do not mean to make you a speech, so I end by exclaiming: May dairying prosper!

The session closed at 7.30 p.m.

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FOURTH SESSION OF THE CONVENTION, WEDNESDAY, DECEMBER 6TH, 7.30 P.M.

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OFFICIAL OPENING OF THE CONVENTION.

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OPENING SPEECH OF THE PRESIDENT, M. L'ABBÉ MONTMINY.

*My Lord and Gentlemen :—*

Every child of congenital good feelings invariably retains an ardent attachment to his home. However far he may have wandered from it through the chances of life, or rather by the designs of Providence, he is always rejoiced to revisit it, if circumstances permit of his returning thither. Thus the migratory bird, after having wandered abroad over foreign lands, returns to its nest, and folding its wings under the shelter of its paternal tree, seeks the repose his long trans-marine flight has rendered so welcome.

Our great and powerful society, the Provincial Dairymen's Association, born at St. Hyacinthe, very weak, very small, eleven years ago, has, like all children, increased in stature, gained strength, and left its cradle to roam through the world. It has visited splendid regions, has received the hospitality of great cities, of prosperous villages, has diffused the benefits of its work over the whole agricultural population of the country. One by one it has been received at Quebec, Three Rivers, L'Assomption, Arthabaska, Sorel, Ste. Thérèse, and wherever it has been it has done honor to its natal city, St. Hyacinthe, whither it has to-day returned.

Yes, gentlemen, the child returns to-day to its home, and is sure to receive there a joyous welcome, for it brings with it good tidings. Like all children, in proportion to the growth of our association, so has the extent of its field of labor increased. Trusting the more in its strength as it found its power increasing, it has aimed at operations of greater and greater usefulness, operations capable of doing good to a larger number of its clients. And it is for that reason that, during the present year,

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it has succeeded in accomplishing great things, the result of which I am about to describe to you.

In the first place, I am happy in being able to announce to you that the number of the members of the association is rapidly increasing, and that this year it has risen from 600 to 1,000.

This is an excellent augury for the future, and I entertain the hope that, before long, this number will be doubled. This prediction may seem to you rather bold, but, if you will consider the great crowd of persons who are interested in the dairy-industry in this province, you will conclude that I have rather fallen short of than overestimated a fair measure of anticipation.

You will remember, gentlemen, that last year we were obliged, very reluctantly, to accept the resignation of our first and able secretary, Monsieur Taché.

We had two reasons for deploring the retirement of this most devoted officer.

First, we knew how great an amount of skill, energy, and industry he had placed at the service of our association, and, then, we felt that, precisely on account of the great services he had rendered us, we should have great difficulty in finding a substitute for him. I must say, though, without wishing to anticipate the future, and founding my impression on what has taken place this past year, that we have been fortunate in the selection of our new secretary, M. E. Castel, who succeeds M. Taché. Formed in the school of the latter, during what I may call a six months' noviciate, he has shown an aptitude for work, an amount of zeal and devotion which, although practised during but a short time in the service of the association, give good promise for the future, if, as I do not doubt will be the case, you continue him in his office.

During the last session of the provincial parliament, the idea was suggested of holding, at Quebec, a grand Congress of farmers to study the important questions that concern the immense majority of the population of the country, the farming class. The idea met with a favourable reception, and the Board of Directors of our association was honoured with the duty of organizing and managing this congress. The time for this organization was brief, but, thanks to the efforts of our directors and officers; thanks especially to the labour undertaken by MM. Taché, Chapais, and Castel, acting in concert with M. Gigault, the Asst. Commissioner of agriculture, and Mr. Barnard, Secretary of the Council of Agriculture, the congress was fully organized by the appointed time. As to what concerns its success, you will see in the report of its proceedings, which is now in print, that it fully answered the purpose it was intended to fulfil. The most practical of its results was to introduce to our legislature the most eminent *agronomes*, the most advanced agriculturists, and the friends of agriculture, of our province. There, they had an opportunity of exchanging their views, of discussing their ideas, and of harmonising their conceptions on the grand principles that govern rural economics. The effect of such a congress will be long felt in every part of the province.

At the Ste-Thérèse convention, last year, the association passed a resolution

praying the legislature to make a grant to the Farmers' Clubs, thus favouring and setting in order their organisation. Our voices were listened to, and the Law of Agriculture was modified in accordance with our resolution. The result was that these useful clubs at present number four hundred in the province.

If we consider that thousands of pounds of grass-seeds, hundreds of throughbred breeding stock, and a vast number of agricultural implements, such as chaff-cutters, etc., have been purchased this year by these associations, we shall see at once how great an influence this legislation has exerted in favour of the clubs.

The event most interesting to our society during the present year, is, indubitably, the opening of our *dairy-school*.

Long ago, it was felt that this sort of thing was an absolute necessity, if we really desired to impart to our dairy-industry all the upward flight we, in our visions of the future, hoped it would develop. From the creation of the association, we all had the idea, and immediately started a school-factory for the partial education of makers and apprentices who should visit it, in certain methods of manufacturing dairy-products. That was sufficient in the days we only had some fifty factories in the province. But, year by year, as dairying developed itself, as the number of the factories increased, as skilled makers became more and more necessary, it was perceived that this school-factory, in spite of the services it had rendered, was no longer sufficient for the demands made upon it.

Then, in reply to the wishes of every one, the directors of our association set to work to study a project for the creation of a new provincial dairy-school. After consulting with those who were in a position to aid them with their intelligence, their influence, and their wealth, they succeeded, thanks to the initiative of the corporation of the college of St-Hyacinthe, and the good will of the Hon. Commissioner of Agriculture, seconded by our legislators, who, without distinction of party, felt the importance of this establishment; they succeeded, I say, in organising the excellent school now in operation here, for nearly a year already, and which you are specially invited to visit during your stay at St-Hyacinthe. The staff of our school consists of a Director-general, Professor Robertson, Dominion Dairy-Commissioner, a technical director, M. Damien Leclair, who is also teacher of butter-making, a cheese-maker, Mr. Henry A. Livingston, and a secretary, who is our own secretary, Monsieur Emile Castel. Besides this staff, attached directly to the school, there may be mentioned as specialists taking a part in the instruction afforded, the Abbé Choquette of the Seminary of St-Hyacinthe, M. T. C. Chapais, Dominion asst. commissioner of dairying, MM. Côté and Macfarlane, general inspectors of syndicates.

Already 214 pupils have passed through our school, which is certainly a model establishment of its kind. To support this assertion, I will cite the testimony of an expert in dairying, who travelled through North-America lately, on his visit to the Chicago Fair.

I am speaking of M. R. Lezé, editor of the French paper *La Laiterie*, and a professor at the farm-school at Grignon, a man of great powers of observation. On his

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(<sup>1</sup>) M. R. Lezé  
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road hither, M. Lezé visited the dairy-schools of the States, and the Guelph agricultural school, Ontario; so he is in a position to establish a comparison between our school and those he saw elsewhere.

Here, first of all, is what he says about our provincial dairy-men's association, after speaking of the formation in the Dominion of associations of this kind: "One of the most complete and best organised among these associations, so eminently useful, is the Dairy-men's association of the province of Quebec."

In his paper *La Laiterie*, where this passage occurs, and in the same number of 21st October last, after having described at length, and cited as an example to France our organisation of Syndicates, M. Lezé speaks as follows of our dairy-school: "The school is a vast wooden building on the banks of the Yamaska; it is a thoroughly practical school, for it is a manufacturing dairy, cheesery, and creamery, buying its milk, selling its manufactures, and consequently realising, in our opinion, the ideal of practical instruction; for the dairy cannot prosper unless the principles inculcated are correct; there must be no error, no fault, either in the practical management, or in the book-keeping, of such an establishment.

Details of the teaching given in the school then follow; after which M. Lezé continues thus:

"The management of this school was not an easy thing; it had to be entrusted to a man of clear views, to an organiser, and the committee of the association selected for the post its secretary. (1)

"He was the very man for the place; ardent in his work, and anxious for its success. He is assisted by a working director, M. Damien Leclair. In conversation with them, I was able to appreciate the talent, the skill of both, and I do not doubt their power to bring their difficult task to a good end.

"I am happy to say that it is precisely this adequacy, this ardour for work, in all the members and officers of this Quebec Association, that left me with the more lively impression.

"It was with pleasure and profit that I listened to the words of MM. Taché, Chapais, Fisher, and of many others, but not without some anxiety for the destiny of our country (*France*), for I perceived among our young Canadian brothers that enthusiasm for the contests of life that we have no longer, and it was painful to hear, as a precursor of our decline, the name of *French cheese* given to inferior products."

This extract, gentlemen, is rather long, but I could not resist the temptation of reading it to you, for it does us honour, and it is only fair towards those who are its subject, to diffuse a knowledge of it as much as possible by inscribing it in the journals of our Association. I confess that it is not without legitimate pride that I read it and communicated its contents to you.

The work of the syndicates of butter and cheese-factories is making progress. It received a vigorous impulse by the fact that the Hon. Commissioner of

(1) M. R. Lezé is mistaken in the part he assigns to M. Castel in the dairy-school; M. Castel is simply the secretary, and has nothing to do with its management.—E. C.



Agriculture, desirous of seeing these syndicates established everywhere, so that not one factory in the province shall ultimately remain un-syndicated, has liberally encouraged the creation of new syndicates by offering pecuniary rewards to those who get them up. There were fourteen syndicates in operation last year, there are now twenty-eight. Owing to this increase, another Inspector-General has been appointed, Mr. Peter Macfarlane not being able to do the work alone. The establishment of the dairy-school having done away with the need of the travelling-school which had been previously at work, we made M. Saül Côté, who had been a professor at the suppressed school, the new Inspector-General.

During the past summer, the syndicates were inspected in a most thorough manner by one of our directors, M. J. C. Chapais, accompanied by M. Côté, the Inspector-General, and Mr. Livingston, instructor in cheese-making at our dairy-school. In this inspection, M. Chapais acted in his official character of Dominion Asst. Com. of dairying, and its object was: 1. To inquire into the efficiency of the syndicates; 2. To try to find means to induce all the factories in the province to become syndicated; and, lastly, to find out which of the factories visited would be likely to supply good samples of cheese and butter for the Chicago Fair.

And, since I have mentioned this fair, I cannot refrain from touching slightly on the great success our province met with there in its exhibits of cheese and butter. I do not intend to enter into details, for these are familiar to you all from the reports in the papers. I will only say that, out of the 100 marks possible in the butter competition, Quebec furnished the exhibit which won the highest number (99) and that the maker of that butter was the working director of our dairy school, M. J. D. Leclair.

As to cheese, out of a possible 100 points, the highest number gained was 99½, and several samples from this province, as well as from the other provinces, attained to these figures.

We thus appeared in the best possible light, at that great World's Fair, as regards dairy products, and this is a matter of the greatest interest to us, the members of the Dairymen's Association. This success is due to the exertions of men whose names I mention because they have deserved well of their country, and it is right that their example should be cited as an encouragement to young people just starting in dairying. Gratitude is due to MM. Chapais, Robertson, Taché, Foster, Patten, as well as to all those who have assisted in giving to the Canadian dairy products sent to the Columbian Exhibition such an enviable reputation. This reputation will gain for our farmers, whose energies are almost entirely devoted to the production of butter and cheese, thousands of dollars paid for our goods by those foreign consumers, to whose ears the gale of publicity shall waft the news of our success.

I will suggest, here, that the new Board of Directors should publish in our next report a list of the successful competitors from our province at the Chicago Fair. By this, these names will for ever be respected as belonging to men of skill, industry, and activity, who have done honour both to themselves and their country.

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And now, gentlemen, if we have a right to rejoice freely at our legitimate success, to feel proud of our fine dairy-school, to entertain lofty expectations of the future of our syndicates, we must not forget that we have other duties to fulfil, one of which is to express our gratitude to those who have helped us.

If our Association is able to accomplish great things, it is due to the liberal aid it has received from the guardians of the public wealth. Never have our Governments been deaf to the frequent appeals we have made to them, for they were convinced that we were making good use of the sums they have so freely imparted to us. And, so, I will conclude by two words addressed to them: The first is, *Thanks*; the second, *More*. *Thanks* for past favours; *More*, for the wants of the future. For our work is not finished; we must keep on advancing; and it is for this reason that, without detaining you any longer, I leave you to the important labours that will demand all the time at your disposal during the duration of this convention.

*Gentlemen*, at the Sorel meeting, the members of the Dairymen's Association were welcomed by the venerable *curé* of that parish, who is now seated on this platform. The kindly words he addressed to us at that convention were deeply felt by all, and we have always preserved a grateful remembrance of them.

The *curé* of Sorel is now a prince of the church, and, in spite of his numerous occupations, he has consented to come hither this evening to encourage by his presence the labours of this convention.

In the name of this meeting, My Lord, I say: Thank you; I dare not say, Again; because we would not abuse your kindness. We thank you for your encouragement. Your presence, My Lord, is an approval, a stimulant of our exertions. Condescend, My Lord, to accept the expression of our gratitude; and, in conclusion, I implore you to bestow upon us such a measure of good advice that we may follow during the time to come as our guide in our patriotic labours.

## SPEECH OF MGR. DECELLES,

BISHOP OF DRUZIPARA.

*Gentlemen*:

The chief object of my visit was to testify by my presence the lively sympathy that your flourishing Association inspires me with, and to listen to your able and interesting discussions.

Here my part ought to end; but I can hardly decline the graceful invitation your President has made to me to address a few words to you. I accept it, then, although my incompetence forbids my attacking those subjects that the nature of your convention seems to indicate. Still, I am at liberty to express publicly my sympathy with, and my admiration for, your so patriotic work; this must be enough for me.

And, gentlemen, the expression of such sentiments on the part of a bishop ought by no means to surprise you. For, in truth, the interests of religion and the welfare of

the people, of which bishops, from their position, are the guardians, are too intimately connected with the prosperity of agriculture to allow us to view with an indifferent eye the marvellous progress for which the farming class is indebted to your grand Association. This progress is proved in an indisputable manner by the interesting report your President has just read to us.

Allow me to tell you that I extol the more freely this success, because it is the most eloquent justification of the ideas I have put forth, and of the advice I have so often given to the worthy farmers with whom I have so long been in communication.

As the President has had the kindness to remind you—with too much partiality, doubtless—I watched most attentively your transactions at Sorel. I beg you to believe that the constant attendance at your sessions, that you then remarked on my part, was caused as much by a lively interest in your learned and practical discussions, as by the duty of testifying my gratitude to the distinguished guests who honoured my parish by their presence.

And, why not, gentlemen? There are so many ties that connect me with the agricultural classes, that if, in the eyes of some people, the ardent love of agriculture were a defect in the *curé* of a town or of a bishop, far from blushing at it, I should glory in such a weakness; a weakness of which I can do so little to cure myself, that, if you will allow me, I will make a small confession, though I must tell you, before hand, that I am not in the least degree testifying any contrition for what I have done.

As many of you already know, before I occupied the honourable position of *curé* of Sorel, I was, for nearly ten years, *curé* of the lovely, though poor, little parish of St. Roch de Richelieu. Ah, gentlemen, what a pleasure it is to recall these memories of the happiest years of my life! When I feel the pressure of the heavy burden that now encumbers my shoulders, I almost feel angry with my venerable bishop for having called me away from that humble post.

At St. Roch, then, where I used to encourage my parishioners to abandon their old system of farming, after numerous discussions, I had the pleasure of seeing a cheesery built, which perhaps had not been started except for the wish of the people to be at peace with the parish priest. Root crops, which had hardly been grown at all, were cultivated to a considerable extent, after experiments, made with the object of convicting the *curé* of holding erroneous ideas (*d'idées de l'autre monde*), had demonstrated the vast utility of these crops, for the improvement of the land and the improved feeding of the cattle.

And lastly, thanks to the obedience one of my parishioners seemed to have vowed to me, I had the pleasure, before I left for Sorel, of seeing the silo introduced into my parish.

Were I to say, gentlemen, that all these changes were brought about without opposition, I should exaggerate; for, at St. Roch, as elsewhere, there were deeply rooted prejudices against the promoters of reforms in agriculture.

With your leave, I will relate a story which, if it be only a repetition of many

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others that you have already heard, may, perchance, have at least the effect of encouraging you to pursue the course on which you have entered.

While I was striving, by advice and example, to make my working people at St. Roch appreciate the importance of changing the old forms of cropping they generally followed, a young man, son of an intelligent farmer in the next parish, came and settled in ours. Assisted by his father, he bought a small farm for \$2,100; he had two horses, three cows and some other cattle. He only owed \$800, and as he felt himself endowed with strength of body and plenty of resolution, as well as with intellectual capacity, he had no doubt about succeeding.

But his new neighbor was not of the same opinion. This was a good old fellow who, for 40 years past, had seen the fertility of most of the St. Roch farms depreciating year by year.

Sir, said he to me, in one of our frequent chats, this young man is nicely taken in! Poor lad, he thinks he can grow hay on his farm; no doubt he fancies it is the same soil as his father's farm is. Ah! it will not be long before he finds out that he has bought this inferior, out-of-condition farm rather too dear. For, sir, my land is better than his, and hay won't grow on it! Poor lad!

Two years elapsed, gentlemen, during which I heard nothing about our young friend but this: What an industrious, orderly, systematic fellow this Sausoucy is. For it is high time to tell you that the lad's name was Sausoucy, though, as you see, his name by no means expressed his character. (1)

In the third year of his farming, as I was reading the report of the inspector of the Agricultural Society, I saw with as much pleasure as astonishment, that Sausoucy had won the prize for the best meadow in the County of Richelieu. In spite of the prediction of his old neighbour, he had succeeded in growing heavy crops of hay on land that used only to produce daisies and couch-grass! After three more years, in each of which he carried off the prize for the best meadow from all the competitors of the county, Sausoucy, to get back to his family, sold his so-called poor farm, and profiting by an excellent offer, made a gain of \$400 by the sale. Out of the profits of his farm he had paid his debts, and had in hand a few hundred dollars of savings. This is what he had done, thanks to an improved system of farming.

But, gentlemen, you will probably ask me: Did this young man gain all this by growing hay alone? By no means, sirs; he kept milch cows; only a few, for his means were limited, but he kept them well, being convinced that water does not become converted into milk and butter unless it is accompanied by food rich in quality and abundant in quantity. It was with this view that he started, and it was the chief cause of his success.

I will complete my story by adding a trifling detail. On another occasion, when I was talking with my good old friend, he remarked: Do you believe this, sir? Sausoucy tells me that the butter of his three cows brings in so much a year (I forget the exact sum). To this I replied: Of course I believe it, and if you will wait a

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(1) Sausoucy=Careless.

moment I will prove it to you. You know that I have five or six persons to feed; that I buy neither milk, butter nor cheese, although my table, as you know, having now and then done me the honor to dine with me, is always well supplied with these dishes, and with many others that need a quantity of milk in their preparation. Now, observe, with my two cows my housekeeper has, during the last nine months, sold \$65 worth of butter, after having supplied the wants of the house. And not satisfied with having shown him the receipts in my accounts, I made my housekeeper herself confirm my statement.

And now, said I, do you believe that Sausoucy has not deceived you? Yes, replied he, I must confess that the lad *has taught his grandmother to suck eggs* (*nous en remontre*).

I bring my story to an end, gentlemen, as I do not like to trespass on your patience. I think I have fully shown that I have a lively interest in the great and noble cause you support. Yes, I praise and bless your work; and, if I may be allowed to offer you a piece of advice, I would say: Become, all of you, Sausoucy's? To do so, you have only to pursue the path this grand Dairymen's Association is pointing out to you.

### ADDRESS OF MR. ED. A. BARNARD.

*Mr. President :—*

You will perhaps permit me to make a few remarks with which the presence of the Bishop of Druzipara among us has inspired me. I think that, after 23 years of study and official work, I am well acquainted with the province of Quebec, and it seems to me that I can affirm, without fear, that, in spite of the progress we have made in farming, we are still far from having attained to the results we had reason to hope for; but I also think that, without great self-devotion, without great energy and perseverance, it is difficult to obtain convincing results, to give the requisite agricultural education to the rising generation, so that its members shall become thoroughly acquainted with the science of agriculture. But I find my consolation, Mr. President, in the fact that the great self-devotion that we need to lead us to the desired results actually exists. It exists, sir, among those persons who have always taken the lead when self-devotion was needed, who have preserved our country, who have made it what it is. I mean the Catholic clergy of our province, the men whose disinterested labors have done so much for the material progress, for the prosperity of Quebec. I mean such men as the Abbé Côté, for instance, who spares neither his time nor his labor in encouraging his fellow-citizens to march onwards along the path of progress. And, sir, it is also as well that we should show in our archives that, this evening, a Prince of the Church has honored us by his presence, and given us, in a most charming form, advice of the most precious value, advice suited to encourage us greatly. The fact that a bishop has been present this evening at our deliberations is highly

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fitted to show our youths how much importance they ought to attach to the study of agricultural science. I spoke just now of self-devotion; it is this that is really required in conducting a series of addresses like that which is being carried on in all parts of the province, and without any remuneration, by our agricultural missionaries, under the patronage of their lordships the bishops.

It is therefore, once more, a pleasure to know and to have entered in our annals, that a Bishop of the Province of Quebec has condescended to come hither to converse with us about agriculture. I propose, sir, that we profit by this occasion to pass resolutions expressing our gratitude to the bishops of this province for having appointed in each of their respective dioceses an agricultural missionary, who is not only a missionary of the Gospel, but who devotes all his time and energy to forward the material prosperity of his fellow-citizens. This, gentlemen, is a pure act of self-devotion, for, I may mention this for the sake of those who do not know it, our agricultural missionaries receive absolutely no remuneration from the government; their labors are perfectly disinterested. Was I not right, then, in saying that it is consoling to see such men in the front ranks of the regiments of progress?

We have certainly advanced during these latter years, but we are only beginning to advance. We have still an immense deal to do, and if we all are delighted to reckon upon the labors of our apostles of agriculture for the future, we must not forget to thank the bishops who have been good enough to give us these apostles.

I propose, then, this resolution :

That the Dairymen's Association gratefully prays their Lordships the Bishops of the Province of Quebec to condescend to accept the respectful expression of its lively gratitude for the assistance they have given to the diffusion of agricultural information by the institution of the agricultural missionaries.

The resolution was greeted with great applause.

While the President was reading his address, the Secretary received from the Hon. the Commissioner of Agriculture, a telegram, which he read to the meeting.

TELEGRAM FROM THE HON. LOUIS BEAUBIEN, COMMISSIONER OF AGRICULTURE  
AND COLONISATION.

Quebec, December 6th, 1893, 7 p.m.

E. CASTEL, *Secretary D. A.*

I should have been very glad had I been able to be present at your meeting to-day, but the business of the session deprives me of that pleasure. Tell the meeting of the Dairymen's Association how sorry I am.

I hope that the success obtained this year by our dairy industry at Chicago, which success is due in great measure to the efforts of your Association, will encourage you to increased zeal in developing still more this industry, which is the most effective means of forwarding the rapid progress of our agriculture by rendering it directly remunerative.



I draw the attention of your Association :

To the necessity of completing the organisation of cheesery and creamery-syndicates, so as to embrace in them all the factories of the province ; to reorganise the existent syndicates and to form new ones :

Also, to take steps to let the Board of Trade at Bristol know of the success of "French Cheese" at Chicago.

I wish you every possible success at your meeting.

(Signed) LOUIS BEAUBIEN.

### ADDRESS OF M. G. A. GIGAULT,

ASSISTANT MINISTER OF AGRICULTURE AND COLONISATION.

*My Lord, Mr. President, and Gentlemen* :—Having had the honour of addressing you last evening, I thought my task was over, whereat I rejoiced, for it is always painful to me to speak in public.

You invite me, as representing the Hon. Commissioner of Agriculture, whose absence you regret this evening, to say a few words. M. Beaubien is a practical farmer, and would have interested and instructed you ; I, alas, can do neither.

I came hither to gain information, to learn what are the wants of farming and dairying, that I might be in a position to keep the Commissioner *au courant* of your operations and decisions.

Last year, at the Ste. Thérèse meeting, you protested against a resolution adopted by the Board of Trade at Bristol, England ; a resolution calculated to injure the good repute of our cheese.

Subsequent events, especially the success we met with at Chicago, have amply avenged you on the unjust attack contained in that resolution.

You, the members of the Dairymen's Association, must congratulate yourselves on the success that has crowned the labours to which you have devoted so much attention since the year 1882 ; labours of which Monsieur Taché has been the guiding spirit.

The banquet of last night did honour not only to M. Taché, but also to your hearts and to the good feelings that animate them.

Your meeting has been highly interesting. The lectures I heard to-day will be very useful to farmers. It is always beneficial to listen to practical farmers, like M. Brodeur, whom we always find ready to aid us whenever the advancement of agriculture is the subject we are engaged in. At Quebec, we often receive accounts of the lectures given before the clubs by M. Brodeur, and we are ready to receive from him another account for lectures or for travelling expenses. He is not the only one at St. Hyacinthe to devote himself to the service of agriculture and the dairy industry. I must say, in praise of your district, that you are renowned for the zeal which you display in the cause of agriculture. The Duponts, Péloquins, Brodeurs, Macdonalds

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and many other farmers of your district, deserve sincere congratulations for the efficient work they have done in promoting the development of dairying and agriculture in general. These examples, this devotion, will assuredly have their effect on the whole province, and will cause others, men useful to the cause of agriculture, to emerge from the crowd.

It would, however, not be fair to leave you to think that in other districts there are no devoted men who interest themselves in the progress of farming; men of the class there are everywhere, but not so numerous as in your parts.

Yesterday, you had the advantage of listening to Prof. Robertson, an authority on matters of agriculture. His lecture, doubtless, you found very interesting, and the advice he gave you will bear good fruit. He explained to you how impossible it was in this country, without dairying, to arrive at satisfactory results in farming; he showed you that cattle were the foundation of the agricultural prosperity of the country, on account of the products yielded by them, and the manure they supplied, that indispensable auxiliary to all good farming.

M. Brodeur spoke to you about taking care of manure. This is certainly one of the most important questions for farmers, for, if the liquid is allowed to run to waste, the value lost every year amounts to a considerable sum. The advice given you by M. Brodeur I have seen put in practice by the Ontario farmers, during a visit I lately paid to a district of that province.

There, I observed the great attention paid by farmers to the preservation of dung, especially to the liquid part. With all these good farmers, the dung heaps are made carefully; they are pressed, by the horses and cart wheels, so as to exclude the air and hinder too rapid fermentation. Frequently, they have the urine scattered over them, and if they are not under a shed or some kind of roof, they are, at any rate, made away from the rain-water gutters, and pits or excavations of some sort are dug to receive the urine.

Whatever may be their opinion as to the necessity of keeping dung under cover, they are all satisfied that every effort must be made to preserve the urine, for the purpose of either scattering it over the mixen, or, after mixing it with water, of spreading it over the land.

From the last census, it appears that Ontario produced, in 1890, \$7,300,000 worth of cheese, and Quebec only \$2,400,000 worth; a difference of five million dollars in round numbers!

This, furthermore, is a difference that does not redound to our honour. We must get rid of it as soon as possible.

In face of this difference between the production of Ontario and Quebec I am not surprised; for it is due to the fact that Ontario farmers grow vegetables, root crops, and green fodder to a much greater extent than our farmers do. Wherefore, I congratulate you on the resolution you adopted this afternoon, by which you suggested that it would be well if the agricultural societies would encourage by prizes the growing of green crops in general. If we were to extend the average of our

fodder crops, our farmers might increase the number of their cattle, and the production of milk; and thereby put an end to this difference I am speaking of, a difference certainly not likely to add to our credit.

On almost every farm I visited in Ontario, I saw fields of swedes, carrots, and other roots, which were used profitably in the production of milk. There were, among these, fields of four, seven, and even ten acres. At Owen Sound, I had a long conversation with an extensive breeder. This year he grew seven acres of swedes, and last year ten acres. On my remarking that these crops required a great deal of labour. "True," replied he, "*but without labour no success is possible; this is true in farming, as it is in every other business.*"

From this man I got a good deal of information on his way of growing roots: "Last year," he said, "after carrying the pease, I spread the dung on the piece on which I meant to grow roots. I ploughed it in with a shallow furrow, and towards the end of autumn I ploughed again deeper. In spring, I grubbed and harrowed thoroughly along and across the land, and about June 10th I sowed the swedes after a second lot of harrowings. They yielded from twenty to thirty tons an acre. My root cellar would not hold my crop, so I was obliged to put the rest into pits (*caveaux*) made on purpose."

In another township, I met a farmer who was paying a large rent for his land. He had a field of turnips, carrots, and other roots; like all good farmers in Ontario, he had a chaff-cutter and a turnip-cutter. The main object and ambition of Ontario farmers is to grow a great lot of green fodder and roots, so as to be able to feed a large herd of cattle and produce a great quantity of milk. They see that dairying is the most profitable branch of farming and that, in most of our counties, farming cannot pay without it.

Yesterday evening, gentlemen, your convention was honoured by the presence of a Minister of the Crown, and of a distinguished member of the magistracy. This evening you are honoured by having with you his Lordship M. Decelles, one of the clergy, to which body the French-Canadians cannot show too much gratitude for the immense services it has rendered to their nationality.

We ought not to be surprised, gentlemen, at the active part taken by the clergy in the promotion of the progress of agriculture in our provinces; for, indeed, every time there is a good cause seeking support, our clergy, that interests itself so warmly in our progress, both moral and material, is always ready to lend us its aid.

Almost every class of society seems united in coming to the support of agriculture, and in working for its prosperity. This concurrence of good sentiments is producing the most encouraging results.

Why does everyone take an interest in agriculture? It is because it is generally felt that the interests of agriculture take precedence of every other. When the agriculture of a country is not prosperous, it is impossible to look with confidence to the future of that country.

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Emigration has, in the past unfortunately, decimated our ranks and greatly weakened our powers.

For the general interest of the country an end must be put to this emigration, and a stop be put to the growth of our cities at the expense of the rural districts. To ensure this, we must strive to develop our agriculture and to increase its productions.

According to our constitution, the proportion of the deputies of the other provinces is based on the numbers of the population of the Province of Quebec. If our population decreases, the ratio of the members for the other provinces increases, and we, the people of Quebec, proportionally lose our influence. If, on the contrary, by the development of agriculture, by the diffusion of agricultural information, we succeed in making farming prosper, we shall put an end to emigration, our population will increase, and the ratio of the members from the other provinces, instead of expanding, will contract. For it is on agriculture that our future depends; it is by that art that our province can acquire a prestige and an influence which will become known and felt not only at home, but also at Ottawa, where questions that greatly interest us are discussed.

And thus it happens that no surprise should be felt at the sight of the civil and religious authorities uniting in forwarding the development of agriculture and the increase of its products; these things concern our most vital interests.

You must have remarked that in all the addresses you have heard here, the speaker finished by saying that industry ensured success. And truly, gentlemen, to bring the work that unites us to a successful end, not only are speeches and advice needed, but earnest labour impregnated by knowledge and perseverance. This, I am convinced, will not be wanting, and under the influence of intelligent industry we shall surely see our farm products increase and our position improved in every respect.

#### DISTRIBUTION OF DIPLOMAS TO THE INSPECTORS.

The Secretary then proceeded to distribute the diplomas of Inspectors of Creameries and Cheeseries to the following successful candidates:—

*Inspectors of Creameries.*—MM. Carl Zetterman, Quebec; Albert W. Kimpton, Piedmont.

*Inspectors of Cheeseries.*—MM. Germain St. Pierre, Victoriaville; Geo. Boland, Ste. Ursule, Mark.; Louis Gilbert, St. Ferdinand d'Halifax, Még.; P. A. Robillard, St. Thomas de Pierreville, Yam.; Elie Bourbeau, l'Ange Gardien, Rouville; J. A. Plamondon, Powerscourt, Hunt.; Geo. W. Ferguson, Huntingdon, Que.; John W. Ross, Hawkesbury, Ont.; A. S. Lloyd, Ormstown, Que.; Charles P. Ray, Isle aux Grues.

*The President.*—It is with great pleasure that I am about to confer on M. St. Pierre the diploma of our Association, for he has very justly earned it. He has

honoured us at the Chicago Fair by winning, by himself and one of the makers of the syndicate, 99½ marks out of the hundred for two lots of cheese. This number of marks were only won by four lots of cheese from Quebec and five lots from Ontario.

M. St. Pierre deserves the congratulations of the whole province, and as president of this society, I offer to him my sincere compliments.

*M. St. Pierre.*—From my heart I thank you, Mr. President, for the honour you have done me. I had no right to expect it, as I only did my duty, by putting in practice the lessons I received at our dairy-school.

*Mr. Barnard.*—Mr. President, I think it my duty to lay great stress upon the progress you commented on, when presenting this diploma to one of our compatriots.

A member of our society, who has worked heartily for our good, who is one of our friends though not known to all of us, called my attention to the marvellous intellectual capacity of a number of youths who were called together to form a special committee of inquiry into the plan of paying for milk according to its richness.

I think it my duty, Mr. President, to lay stress upon this, because it is likely to encourage those youths who are endowed with aptitudes for the carrying on of dairying. In this province there is a great number of youths who, we feel sure, would succeed admirably were they to apply themselves to farming in general, and to dairying in particular. The fact that one of our compatriots gained at Chicago that amount of success on which you justly congratulate him, ought to give the greatest encouragement to our young compatriots. If M. St. Pierre obtained such success, why should not others do the same? He is not the only one; there are others who, thanks to industry and application, have also obtained their diplomas. Let this be an encouragement and example to be followed by our young compatriots! Let there be next year, and in future years, more who labour to deserve these diplomas! There are certainly more who could if they would; it only depends upon themselves.

The President then proposed that the meeting proceed to the election of the officers of the Dairymen's Association.

He requested the meeting to accept his resignation of the office of president of the Association.

*Mr. Barnard.*—I do not know whether I am in order or not; but, with your leave, Mr. President, I will make myself the mouthpiece of the meeting, and beg you to accept anew the office of President of our society.

We know that you were elected against your will, and that only patriotic feelings induced you to accept the post. You represent, in the Dairymen's Association, independence of character, and more than that, energetic worth, and entire devotion to the cause of agriculture and to the general interests of your compatriots. We have need of you, Mr. President; and I call upon all the members present to urge you to revoke your decision. Moreover, you know that the present Board of Directors has already recommended its successor to hold our next convention at Beauce.

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The Board did this in order to enable the Association to profit by a sight of the work you have carried out at Beauce, in that district, far from markets, and where, in spite of numerous difficulties, you have, thanks to your energy, succeeded in establishing on a sure footing thirty-one cheeseries, which were the first to enter into the syndicates. Would it not be a misfortune, Mr. Curé, that when we visit your place next year, we should have to regret that you were no longer our president? I propose, then, that the President be earnestly prayed to retain his office for another year.

And if you will allow me to make another suggestion, I would propose that this meeting perform another act of justice. We have, as our vice-president, a man of excessive modesty, but an untiring worker, full of devotion to the cause of dairying; you know I am speaking of Mr. Fisher. Wherever the progress of dairying has been in question, there you have seen him working with wonderful zeal and devotion. When he was a member, and had to represent a great county at the seat of Government, he did not look after the interests of that county alone, as some members do, but, instead of acting in opposition to the Government, he employed all his energy, all his time, in the promotion of the interests of the agricultural classes. In our name, he presented to the Government an urgent request for the creation of a department of dairy industry as the experiment farm at Ottawa.

Mr. Fisher is one of those who have done the most for us with the Government. He has done everything in his power, and especially, he has always shown the greatest interest in our society; so much so, that he has become a man we cannot do without. I propose, then, that he, too, be requested to retain his post.

A third appointment I would suggest: That M. Castel remain our secretary. This, however, is a perfectly useless proposition, for I am sure every one is in its favour. When we lost M. Taché last year, the loss was a serious one; but we must acknowledge that we could not have found a better successor than M. Castel, who, with great attainments, joined to remarkable devotion to his duties, and much energy, is without doubt the man for us.

During the past year he has shown us that we were not misled in appointing him our secretary; and I greatly desire that he be re-elected secretary for the incoming year.

*The President.*—I thank you, Mr. Barnard, for your kind expressions. Having been for many years at the head of a large parish, with much work to do irrespective of the work of my ministerial office, I thought that the duties of president of the Dairymen's Association were beyond my strength, and that I could not deploy for the good of the society the qualities needed for the discharge of the duties of so important a position. But your kind expressions encourage me, not to resign my post, but to resign myself to yield to your request. (Non pas à résigner, mais à me résigner).

*M. E. Castel* thanked Mr. Barnard for his favorable words, and placed himself entirely at the service of the association.



*M. Taché.*—M. L. P. Barnard begs the convention to appoint in his place M. Jos. Derome. I, seconded by M. Barnard, propose him officially.

The proposal was passed.

*M. Taché.*—Mr. H. S. Foster, president of the Dairy Association of the district of Bedford, has done a great deal for our industry, of which he is an active and ardent supporter; I think he ought to be a member of the Board of Directors.

This proposal was passed unanimously.

*Mr. Barnard.*—There is a man here who ought to be on the Board to represent his district, where he has earned an enviable reputation among the farmers. He has rendered great service to his county and is about to establish a company for the erection of a large creamery. He is an intelligent farmer, though a most unassuming man; I speak of M. Gabriel Dumont, of the County of Dorchester.

*M. Dumont.*—Mr. Barnard does me too much honour in nominating me for this post. I feel it my duty to say I am not able to fulfil its duties. It seems to me that there are in our district many men able to discharge the functions of the office better than I

*Mr. Barnard.*—M. Dumont must not be judge in his own cause; he is too modest, and I will prove the charge. Nearly eighteen years ago, the Government sent a certain lecturer to Ste. Hénédine, County of Dorchester; I know what I am talking about. M. Dumont was not well off then; he had many encumbrances to pay off; and every one was anxious to see whether or not he would be successful. The lecturer had given in this parish certain counsels as to the way of drawing from the land the greatest possible profit; he had spoken more particularly about the management of manure. As I said, M. Dumont was at that time a farmer, if not poor, at least not well off. His farm, like many others, was very much run down, and some improvement was necessary; new methods of cultivation were needed if he was to live by it. M. Dumont was not an incredulous listener to the lecturer; he understood that the proper use of dung on a farm was the best, nay, the only means by which the farmer could make his land pay. He tried the new system; he set to work, he aimed at wasting none of the manure, but to employ profitably the whole of it. In a few years his farm had increased fifty per cent. in value; he was rapidly advancing towards competency; and, in addition, he had in a great measure paid off the weighty debts he had incurred. Thus, he has gone on from success to success continually; he has paid off all his creditors; he has doubled the value of his farm; he has acquired an enviable reputation among his fellows, so much so that he is now Sheriff (*Préfet*) of his county. I think he is indisputably worthy of representing his district on the Board of Directors of our Association.

The proposition of Mr. Barnard was adopted unanimously.

After these elections, the following officers were appointed:

OFFICERS AND DIRECTORS OF THE DAIRYMEN'S ASSOCIATION FOR 1894.

Honorary President, HONORABLE P. B. DE LA BRUÈRE, St. Hyacinthe.

Honorary Vice-president, M. N. BERNATCHEZ, M.P.P., Montmagny.

President.  
Vice-president.  
Secretary.

District

Arthabaska....  
Beauce.....  
Beauharnois...  
Bedford.....  
Charlevoix....  
Chicoutimy &  
Iberville.....  
Joliette.....  
Kamouraska...  
Montmagny....  
Montreal.....  
Quebec.....  
Richelieu.....  
Rimouski.....  
St. François...  
St. Hyacinthe..  
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President, ABBÉ T. MONTMINY, St. Georges de Beauce.  
 Vice-president, M. S. A. FISHER, Knowlton.  
 Secretary-treasurer, M. EMILE CASTEL, St. Hyacinthe.

## DIRECTORS.

District.	Names.	Residence.
Arthabaska.....	MM. T. C. CARTIER.....	Kingsey, French Village.
Beauce.....	PHILIAS VEILLEUX.....	St. François, Beauce,
Beauharnois.....	ROBERT NESS.....	Howick.
Bedford.....	H. S FOSTER.....	Knowlton.
Charlevoix.....	ED. A. BARNARD.....	L'Ange Gardien, Mtcy.
Chicoutimy & Saguenay.	F. PARADIS.....	Bagotville.
Iberville.....	MICHEL MONAT.....	Mount Johnson.
Joliette.....	I. J. A. MARSAN.....	L'Assomption.
Kamouraska.....	J. C. CHAPAIS.....	St. Denis, en bas.
Montmagny.....	GABRIEL DUMONT.....	Ste. Hénédine.
Montreal.....	ALEXIS CHICOINE.....	St. Marc.
Quebec.....	JOS. DEROME.....	Cap Santé.
Richelieu.....	J. L. LEMIRE.....	La Baie du Febvre.
Rimouski.....	J. DE L. TACHÉ.....	St. Hyacinthe.
St. François.....	D. O. BOURBEAU.....	Victoriaville.
St. Hyacinthe.....	L. T. BRODEUR.....	St. Hughes.
Terrebonne.....	FES. DION.....	Ste. Thérèse.
Trois Rivières.....	ABBÉ D. GÉRIN.....	Ste. Justin.

FIFTH SESSION, THURSDAY, DECEMBER 7th., 9.30 A.M.

## LECTURE BY M. DELLAIRE.

*Mr. President and Gentlemen :—*

You asked me yesterday to address you. I pretended that I was lazy, as I really am, now and then. But I know that in agriculture there is always a way to say something or other, even if that something is not quite new, and so I willingly yield to your request. I heard some very remarkable lectures yesterday, and I observed with pleasure how much importance was attached to the care of dung, of manures. But there is one thing I do not hear spoken of so frequently as it ought to be; the way of deriving profit from the manuring of a piece of land.

To expend the dung is not all—to expend it well, in good season, which is another question and sometimes difficult; then it is of importance to make the good effects of a manuring last as long as possible, whether it be manuring with farmyard dung or with artificial manure, phosophates or superphosophates.

When one has taken the pains to thoroughly prepare a piece of land, it seems to me that we should try, by a good system of rotation, to postpone the necessity of manuring that piece again for as long a time as possible. No doubt it would be highly desirable to manure it again frequently; but every one knows that there is not always manure to spare. There are very few farmers who can say: I have too much dung; and there are not many who can say: I have enough.

I have travelled over almost the whole of the Province of Quebec, and this has enabled me to visit nearly all my compatriots, and to speak to them; well, no one has yet told me that he has too much dung; our farmers generally never have enough.

The question then is: How to make the good effects of manure last as long as possible; and to succeed in this, it is simply necessary to pursue a good course of cropping; to know how to make the crops follow one another, so that one shall prepare the land for its successor, and that each shall yield to the farmer all that the soil can produce without being exhausted. This is most important, because it is by improving, by enriching the soil, that the farmer enriches himself; and it is by impoverishing the soil that the farmer ruins himself. Daily experience proves this.

I will try then, gentlemen, to tell you, if you please, what a good system of cropping is; this system I can only present to you in a general way; and, necessarily, presented in that way, it will suit all those that hear me. For we do not all cultivate the same quality of land; and besides, the different regions you inhabit require modifications in the system of cropping, on account of the climateric variations of each. All these details will, I trust, lead many of you to make objections, to ask questions on the statements I shall make. You see at once my aim. I want to provoke discussion. And that is why I hope that, if every one present will concur, we shall perhaps derive some profit from this conversation.

I said that I wish to propose to you a good system of cropping; this system is more especially suited to those whose farms are more or less worn out, that need improvement; worn out farms are not scarce in this country.

I offer this system specially to that farmer who has not much dung at his disposal, and who wishes to at once improve his land and increase his herd. I will take, as an example, a rotation, or course of cropping, of seven or eight years, and point out, in a general way, the varieties of grain or fodder-crops you ought to grow on your farm in each year of the rotation.

I advise you to grow on a turned up meadow<sup>1</sup>: *First year*, root-crops to pulverize the land: *second year*, a grain crop, barley for choice, because it requires less nitrogen, and clover seed; *third year*, clover crop; *fourth year*, grain with clover and timothy seed; *fifth year*, clover and timothy hay; *sixth and seventh years*, timothy hay; *eighth year*, pasture.

I say then, in the first year, you must grow those crops that want plenty of nitrogen, because the land that year will contain the greatest quantity of it, for good

<sup>1</sup>This means, I suppose, the first crop after grass.—*Trans.*

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dung itself contains a notable proportion of that element. Now, among the plants that require the greatest amount of nitrogen are vegetables and the leguminous crops (*pod bearers*); consequently this process agrees with the state of the land.

I have, gentlemen, seen with these eyes what is going on in the province of Quebec; and it is that causes me to greatly admire what was said yesterday and the day before in the different lectures on the cultivation of roots and leguminous crops. I highly approved of the statement that these crops are not common enough in this province, and this there is no doubt about. People want to carry on dairying. Well, this must be begun by growing plants that contain plenty of water, like the roots and legumens.

If the first year you cannot put as much land into roots as you would like, on account of the labor required, sow the rest of the piece with pease, beans, etc., with what remains of the dung. By *legumens* I mean, for instance, pease; and if you do not like to grow pease alone, sow pease and oats, but always a legumen. Then you will get your green fodder, of which so much was said, most seasonably, yesterday. I say seasonably, for without green fodder I do not think dairying can be prosecuted very successfully. I have visited many parishes where the farmers seem to have tried to succeed in dairying, but, in spite of their efforts, have not done very well. The question then naturally occurs: How do other parishes manage to make dairying pay; how can such important returns be obtained as, for instance, at La Baie du Febvre and elsewhere? How can they succeed, then, in selling cheese to the value of sixty odd thousands of dollars? Common sense replies: Because in those places they do not depend upon pasture alone. "If they have no pasture," do you ask, "how do they manage?" They use green fodder. For, indeed, pasture is not the chief thing that concerns the farmer. I have remarked in my tours the more prosperous the dairy the less the extent of pasture. Pasture diminishes in proportion to the progress of dairying in a parish. This, though it seems strange, is true. Yesterday I heard with pleasure one of the tenants of the Quebec Seminary say that this year he had kept 50 cows on nine acres of pasture. To do this, he did not reckon only on the dry fodder he had, or on his hay; he reckoned on his green fodder. By growing green crops he was sure his pasture would be large enough. The first year, then, let us sow roots and green fodder, with manure. The second year, dung again, with either wheat, oats or barley, the latter for choice; either of the other cereals would do well, but I prefer barley, because it requires less nitrogen than any other grain crop. With the barley plenty of clover should be sown. Clover is, as you know, a legumen, *i.e.*, a *pod-bearing plant*, like pease, beans and many other plants you grow without knowing that these are legumens. Clover is a legumen that requires much nitrogen; therefore, sow it with plants that do not require a great deal of that element.

Daily experience tells us that clover does well when sown with barley, and all farmers hold this opinion.

Said Mr. Chapais to me one day: you all know him for one who has devoted himself for many years to our agriculture, and who is well versed in all the progress

of practical and scientific farming: "Tell me, you who have gone over the Province of Quebec, what would give you the best idea of the state of the agricultural progress of a parish; tell me what would be the first thing on which you would found an opinion as to the point at which the agriculture of a place had arrived? A lecturer does not come to a parish without enquiry, without questioning some persons; he must suit his address to the point of view of his audience. A lecture may suit one place and not suit another; here you will succeed, there you will be shown the door. Tell me, then, what would be your guide in giving a lecture that should suit the standpoint of your audience?"

"Well," replied I, "as to my opinion, the best symptom of agricultural progress, the symptom I look for on arriving in a place, is the clover crop." Fifteen pounds may be sown to the arpent, and even more; it is according to the number of pounds of clover to the arpent in such and such a parish that I judge of the state of agriculture therein arrived at. Were I asked to judge of the progress made in agriculture in this province, I should take that as a basis and ask how many pounds of clover they sowed to the arpent there. Had I to classify each parish according to its merits as to farming, I should make that my basis. I should take a scale of marks, of which the maximum should be 15; a mark for each pound of clover to the arpent. If you sow an average of four pounds of clover to the arpent you would get four marks; if eight pounds, eight marks; if fifteen pounds, I should give you the maximum of points." Once more: it is on this that I should form my judgment on the progress of agriculture in this province. This may seem strange to you, but it is pretty exact; I ask you to give your opinion as to its correctness according to your experience about the matter. You arrive at a place, and you want to find out how to set about getting your lecture listened to. Just try to learn how far growing clover is practised. I have seen many farmers ruin themselves by buying things they could do without, but, as Dr. Grignon said yesterday, I never yet saw the farmer who ruined himself by his purchases of clover seed, and I have already had some experience in this matter. Yes, gentlemen, plenty of clover seed! You will perhaps say: That is easy enough to say in a lecture, but when it has to be bought, it costs a lot. People often say: How dear clover seed is!

I know it costs, but it is worth something, too. To him who tells me "it costs too much," I answer: "Avoid debt." This is my answer. Yes, dread debt more than fires. Fires may burn down your house; it may destroy your barn, your fences; but it will go no further. Debt may destroy everything, house, barn, farm; it may sweep off the whole. Unfortunately, this is not sufficiently attended to. I do not say that we should never contract debts; things there are for which we may legitimately incur debt; but prudence must govern us. Neither do I say that we must never light a fire; it is sometimes not without its use; but beware of debt. Still, when clover is concerned, I say, incur debt, if necessary. Does anyone say: I should like to buy clover seed, but I have no money? I answer: buy on credit, my friend. When one really wants to buy a thing, one can always manage to get it.

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Now, I hold that it is wiser to buy a pound of seed on credit than a yard of ribbon. I prefer a pound of clover seed to many things one does not grudge to oneself and that do not improve one's farm. Plenty of clover seed, then! Generally speaking, it is not sown thick enough.

To return to what I was saying, if you have not plenty of dung the second year, sow barley and clover. You will say that I often go over the same ground. I do so; it is my way.

The same year you should have a fine crop of barley. Do not let your cattle on to the piece. Yes, you will say that is all very fine; but the stock must feed somewhere, and if there is no grass elsewhere, what is to be done? Ah, there is the inconvenience of not growing enough green fodder. There is always a scarcity; grass is always needed, and one cannot effect the least improvement on one's farm. It would be quite a different thing if there were green fodder enough to replace the grass. Thus, the second year, barley; harvest it and shut the gate. The clover will grow away famously. Let it grow. You will say: But it is a pity to waste it; the cattle would do so well on it! But, I repeat, shut the gate; this is not the season to pasture it.

The third year arrives. In the fall of the third year, after one or two crops of clover have been cut, plough it up. You will then have a piece of land that has not lost its fertility; that has yielded, first year, a good crop of roots; second year, a large crop of barley; and the third year, an abundant crop of clover; and all this without exhaustion, for this piece will be in a position to give a good crop of wheat, if required. But if it is found, as many farmers tell me, that growing wheat is not worth the trouble it costs, sow something else; sow any other grain that seems profitable, and clover with it, but not so thick, and timothy. White clover, for instance, two, three or four pounds to the arpent, as the soil may require, but two pounds are generally enough; experience will be your guide. The fourth year, then, will be wheat, or some other grain. Then, the piece will be left in grass. The fifth year (first in grass), there will be clover, and the subsequent years, timothy, one, two, three or four years, according to the richness of the soil; but, however rich it may be, do not keep it in meadow too long. I heard Mr. Brodeur, a practical farmer, say yesterday: Leave your land in meadow, if you will, but if you leave it down too long you will ruin it; and I repeat it, you will ruin the land. I have seen farms that have been left too long in meadow covered with *herbe à cheval* and other weeds of all kinds.

Then, gentlemen, in meadow for two, three or four years, but no longer; that is about the best way of keeping the land in good heart. "But," it will be said, "it cannot be necessary to lose one or two years of pasture. I prefer, when the meadow begins to give out, to leave the grass down as pasture for two or three successive years, according to its quality. Pasturing does not injure the land." A farmer from the Baie des Chalenrs asked me once: Is it better to plough in the fall or in spring? I replied: In general, plough in the fall. To which he replied: But do



you not make a distinction between ploughing stubbles and grass? I do not, said I, because I never plough stubbles. He found that curious. I added: If you plough stubbles you are going to sow grain after grain, and that is not good farming; it will ruin the land. Are there no exceptions to this rule? said he. Yes, but in general do not plough the stubbles. Never sow grain after grain, unless your land happens to be of very superior quality, indeed.

Never, then, leave your land too long in meadow; for timothy is not a leguminous plant like clover, that is, an ameliorating plant, it is a grass, like the cereals, and therefore an exhausting plant. Once more, a couple of years is long enough; otherwise your farm will not yield you annually all it is capable of producing. But, you will say, it is left down in grass to rest the land! True, pasture is doubtless a good thing, but the land has no more need of rest than man has. In farming, the man who takes too much rest is not a good farmer; a piece of land that rests too long no doubt profits by it, but does its owner profit as much? The point is to know, nowadays, that land can produce crops every year without exhaustion, without needing rest. And I say that, to leave land down in meadow for five or six years, under the pretext that it is to let it rest, is to lose a great part of the profit it could yield us, and even that it is the way to ruin it.

Lately I was listening to two farmers. One of them said: Dairying is a good thing. Since I began it I have made more money than ever; it pays well. The other said: I do not agree with you. I have tried it, and I do not find it pay. I have tried it in all manner of ways, and I tell you frankly I am not in favor of dairying. Then, I asked him, why? And I found that he had three little half-starved cows, two that had nothing to eat, and the third was nearly dead of hunger. And that was what this man called dairying! These cows were in a pasture from one end of the season to the other. Aye, and in the self-same pasture, too!

I say that, generally, a meadow should not be left down in pasture. To leave a meadow in pasture ought, in my opinion, to be done as carefully as if it were to be sown with wheat. When we talk about leaving a meadow in pasture, it usually means to make an enclosure in which cows are put for a whole summer, and the following summer, too, whether there is any grass or not. This system is, in my opinion absolutely worthless, and should be abolished as soon as possible; the sooner, the better.

Pasturing an old meadow for two years, if it seems good enough, is long enough, I think. In some exceptional places it may be extended to three years; but in most cases two will be enough. The meadow is then broken up, and the rotation recommences.

What should be done on a broken-up pasture the first year, is a debated point, a point that the Farmers' Club have to discuss. Some say grain the first year; the next, roots or legumens (*pulse*). Others say that grain may be sown the first year, but that it is better to take at once a crop of roots or pulse. I leave the question with you to give your opinion either at once or when I have finished my address.

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What, then, should be sown the first year? From what I have seen, and from the experience of a great number of farmers whom I have consulted, I say that roots should be sown at once.

It is right to sow roots when possible, but I know it cannot always be done, for all sorts of land are not adapted to growing roots. Now, if roots cannot be sown, pulse can; pease, a *meslin* of pease and oats (<sup>1</sup>); this will prepare the land, and the next year roots may be sown, if it can be done on the land in question. It is a problem the solution of which depends upon several circumstances; but, when possible, roots should be sown the first year. That is my own system. I know it will not suit everyone, for what suits Jack may not suit Tom. Still, I am sure it is a system that is suited to the generality of farmers in Ontario and Quebec, for the cultivation of the root-crop will admit of the clearing and pulverizing of the land at the opening of the rotation.

You see that this method of cropping is not exhausting, not too hard upon the soil. The first consideration is not to weary the land, and, while asking it to produce plentifully, to improve the soil. The second is to overcome the weeds. If you only knew, my friends, to what a pitch the cultivation of weeds has arrived in the Province of Quebec! Start from Pontiac and travel down to the Baie des Chaleurs, traversing by this route the greatest length of our province, and you will be convinced that the cultivation of weeds is pretty well advanced! There are lots of them! Everywhere you will be told that it is the fault of the dealers who send out the weed-seeds with the seeds of clover and timothy. This may sometimes be the case, but I can tell you that with a proper system of cropping, you need grow no weeds. If such a quantity of weeds come in your crops, the chief reason is that you too often sow grain after grain. It depends on your having sown, year after year, for 10, 12, or even 15 years, always the same sort of grain, instead of making an annual change. These weeds, which cover, this year, almost the tenth part of your field, will, next year, cover twice as much of it, and in five or six years your field will be literally overspread by them. But my system of cropping makes the succession of crops act so as to clean the land.

In some parishes one sees more weeds than in others; that depends upon the rotation of crops not being properly followed out. Plenty of clover is bought, but this is again an occasion of adding weeds by leaving the land too long in meadow; thus the fields end by being completely covered by weeds.

By adopting this system I have described, farmers will enrich themselves and their land at the same time. They will enrich their land by making implacable war on the weeds. There are so many weeds that inveterate war must really be waged against them. So many parishes are literally infested with them that it is high time they were put a stop to.

(<sup>1</sup>) As usual, the original has *gaudriole*, which means an obscene song. The word should be *goudriole*, though whether that is French or not do I not know, but it sounds like an archaism. The Chambly name for the mixed crop is *gabourage*.—A. R. J. F.

I conclude my reflections, gentlemen, at this point. I should have been glad to raise a discussion on many of the subjects I have treated. You may wish, perhaps, to take up some of the opinions I have advanced as matter for inquiry; that was the object I had in view. It was for the purpose of provoking discussion that I insisted before you on all the points I brought forward.

## LOSS OF FATTY MATTER IN THE MANUFACTURE OF CANADIAN CHEESE

(By HENRY A. LIVINGSTON, of the Dairy School, St. Hyacinthe.)

So many cheese-makers complain of the losses of fatty matter experienced at this time of year, that I have taken this as a subject for my lecture.

This autumnal loss of fat is not a novelty. Do not forget that I am speaking of the Canadian process of making when I say that there is always a loss of fat in the manufacture of cheese; but in summer there are rarely complaints of this loss, for two reasons: (1) The milk being less rich in fat than in the fall, the loss is not great; (2) the loss more easily escapes the makers' notice, because, being kept in a state of fusion by the high temperature, it runs off with the whey. On the contrary, when cold weather comes, the fat coagulates as the cheese leaves the mould (*à la sortie du moule*), and the loss is strikingly evident. The loss, too, appears greater in autumn than in summer, on account of the greater proportion of fat in the milk at that season. Observe that I do not say that the loss is proportionate to the quantity of fat; I only say that it appears to be greater.

No doubt there are makers who lose too much fat; but it seems to me that those who lose too much in autumn also lose too much in summer, although they do not perceive it. This is the reason why I lay before you the results, not only of my own experience, but of the experience of other makers on this subject, assuring you beforehand that I shall quote no opinions that are not founded on scientific data. I shall not speak of the causes of that loss of fat that you find round the cheeses both during and after the pressing. There are other causes of loss of fat; a good deal, for instance, is lost in the whey, if the heating up is carried above 100°; but this loss, which is easily discovered by the Babcock, escapes the eye, because the fat, liquified at the above heat, runs off with the whey.

If, when the whey is run off, the curd is not in a proper condition, *i.e.*, if it is still soft and charged with whey, there will infallibly be a loss of fat.

This loss is explained by the fact that the whey remaining in the curd develops too great an amount of acidity. Now, the acid has a peculiar effect on fat, which effect is usually expressed by the phrase, "The acid eats up the fat." The fat is loosened, deglutinated by the acid, and as at this point in the making of cheese the curd is in lumps the fat finds itself enclosed in the interstices of the curd, and remains there until it is ground. During the operation part of the fat escapes and the surplus leaves the cheese during the pressing.

Some experts explain this loss in another way, by saying that the fat is not

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really detached and isolated in the interstices of the curd, but that, under the action of the acid (of the acids, rather, for after the development of the lactic acid other acids are developed), the condition of the curd changes, becomes bad, its texture is destroyed or weakened to such a degree that it cannot resist the action of the press and at the same time retain the fat.

This latter explanation seems to me more reasonable, and decidedly more scientific than the former.

Again, there will be an additional loss of fat if the curd is ground at too high a temperature—above 92°. At such a temperature the curd, and consequently the fat it encloses, whether or not incorporated with it, are too hot. Every one knows that the hotter butter is the more easily it parts with its form and runs off, whether it be on a plate, in the curd, or even, as is often seen in very hot weather, in the cheese itself. Another trouble in grinding curd above 92° (I prefer 90° myself) is that the mill does not cut it well; the curd when too hot is not firm enough, and instead of being cut it is torn apart, and this, too, puts its texture into a bad condition. If to this be added the influence of the too great heat, which softens the curd, the loss of fat in such cases will be easily appreciated.

A third cause of the loss of fat is bad milk. *The patrons of cheeseries are requested to bear in mind that badly cared for milk occasions a loss of yield.* I believe that with bad milk the loss occurs more particularly in the whey. It is, however, acknowledged that with gassy milk (not aerated or incompletely aerated) so good a curd cannot be made as with well aerated milk. In that case, too, the texture is in fault, and perhaps the same kind of texture that I spoke of above is presented to us.

This being admitted, it seems to me easy to allow that if, in the vat, the curd when "in lumps" is heated up to more than 98°, whether from carelessness or from a wish to hasten the fermentation, there will be a loss of fat.

A loss will occur again if the curd is left too long in the vat before grinding, or without salting. To this I will return presently.

Now, do you ask: How can these losses of fat be prevented? I reply that in dairying, as in medicine, there are certain cases, certain facts, the causes of which are well known, but for the cure of which no remedy or infallible preventive has, up to the present time, been discovered.

Nevertheless, I can tell you of some precautions to be observed.

Before drawing off the whey, see that your curd is invariably firm, and not only firm, but in good condition, all the pieces of curd distinct from each other and shining. In summer, with milk too advanced, as it often is, the curd is frequently submitted to an effective stirring, to prevent too much acidity, and the cheese is often too dry on account of this stirring. The remedy itself is an evil. In both cases there will be a loss of fat. But in the fall, as the milk is never too advanced, there is not the same trouble to dread, so it is easy for the makers to follow the advice I have just given.

When heating up the vat to keep up the temperature of "the lumps," take care not to exceed 98° (I prefer 95°; at that degree the lactic fermentation is developed as freely as at 98°).

Lastly, when your curd is ready for grinding, take care that it is not over 92°. I do not think I need revert to the fault of keeping the curd too long before grinding and salting, for I am aware that the majority of makers grind and salt soon enough, or, rather, too soon. There are some, however, who delay these operations from fear of having a "heaving" cheese. These have some reasons in their favor; for a better cheese may be made by salting a little too late than by salting too soon. Still, they must not forget that in making cheese there is a point of time when the salt must be added. If the curd remains in the vat after that time there will be a loss, and the longer the delay the greater will be the loss.

There is much truth in what an American maker once said to me: "The longer the curd remains in the vat the less yield of cheese will there be." But, as prudence is the most desirable quality in a maker, I can only say to those who are prudent: Be always prudent!

*Mr. Barnard.*—I do not want to deliver a lecture. I only want, in the name of the association, to thank the lecturer for his address. I am glad to declare formally that we possess, in Mr. Livingston, an acquisition truly valuable, both as to acquirements and devotion to his duties. We must acknowledge that he has made many a sacrifice in assuming his present position; this is easy to understand, for any of us French-Canadians can feel what difficulties we should find in discharging the duties that fall to the lot of Mr. Livingston, in a country where French is not spoken.

Mr. Livingston must necessarily have sacrificed much; we ought to thank him for what he has done, and I take this opportunity of thanking him in the name of the association.

#### DISCUSSION ON MR. LIVINGSTON'S LECTURE.

*M. W. Parent.*—I have seen in many factories spots on the cheese, what the makers call "butter spots." Would Mr. Livingston be good enough to tell us the cause of these spots?

*Mr. Livingston.*—I think it is due to an excess of heat during the making. If you heat up the milk, while in the vat, too much, fat will be lost. If you put a piece of butter in a plate, on a cheese, never mind where, and heat up (*the room? Trans.*) you will see the butter melt at once; if you keep the temperature of the vat at 100°, as the inspectors have often seen done, with a view to hurry on the making of the cheese, you will necessarily be raising the heat too much, and this it is that causes this loss of fat and makes these spots on the cheese. The fat, in this case, is not sufficiently incorporated with the curd. It is best to keep the vat at the lowest reasonable temperature. Generally it is heated too much to get on with the making as quickly as possible; but, once more, it is always more prudent to keep the vat at

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*Mr. Vaillancourt.*—As a dealer in cheese, I have often had to sell cheese that had that defect. After visiting the factories and talking to the makers, we, too, came to the conclusion that the temperature of the vat was raised too high. We advised the makers to heat less, and the result we found to be better: there were fewer spots on the cheese. I, too, think that, as a general rule, the spots may be attributed to the cause Mr. Livingston mentions.

*Mr. Barnard.*—I should like to know what proportion of fat a good maker can incorporate with his cheese without loss. Can he get in all the fat of four per cent. milk, of four and a half, or even of more than that percentage? (1)

*Mr. Livingstone.*—This question has been very much discussed. As for me, I have had but little experience in it, except what I gained this summer. In the district of Beauharnois the milk I dealt with for cheese was poor nearly all through the summer. After travelling with MM. Chapais and Côté this summer, I returned to St. Hyacinthe and made cheese there for three weeks. Every morning I took samples of the milk to test, and I found as much as 4.7 per cent. of fat in it; the least I found was 4.4 per cent. I knew that it was already a received opinion that more fat could be incorporated with the cheese, but I was surprised myself at the result. I lost no more fat round the mould than when I was making cheese with milk of  $3\frac{1}{2}$  per cent or 4 per cent. This led me to believe that the milk is never too rich, and that any amount of fat it contains can be incorporated with the cheese. I found, when making cheese at St. Hyacinthe, that there was no more fat lost than when I was making cheese with milk of  $3\frac{1}{2}$  per cent., or even 3 per cent. This is an experience I am very glad to have met with, for the question is a most interesting one to all makers

*Mr. Barnard.*—I, too, believe that more than 4 per cent., and even more than 5 per cent. of fat can be got into the cheese. I compared 31 factories in Beauharnois with each other, and I found that, towards the fall, the milk contained as much as  $5\frac{1}{2}$  per cent. of fat. In other parts the average would be lower, but in general it is found that fall milk contains more fat than does summer milk. This shows the importance of knowing what amount of fat can be got into the cheese; what quantity of fat can be incorporated with the other elements that enter into the composition of cheese. I know, of course, that what is called *cream cheese* contains a considerable quantity of fat, but I raise the question to know how much fat can generally be got into cheese made Cheddar-fashion. You are accustomed to make cheese with a fit proportion of fat in it; let us take milk of 4 per cent. average; I want to know if

(1) Prof. L. L. Van Slyke has been making for several years investigations on this subject which are published in the Bulletins of the Experimental Station of New York State—Geneva. Some extracts from them will appear at the end of this volume, and we borrow from them some notes as replies to certain questions asked during the discussion.



the additional quantity of fat you incorporate with the cheese in autumn pays by giving a greater quantity of cheese from the same milk. <sup>(1)</sup> And if you do not get more cheese, does the extra quality pay you? Do you sell it dearer?

*M. Vaillancourt.*—As a dealer in cheese, and only at wholesale, I cannot say that I have found any real difference in price between cheese rich in fat and cheese poor in fat. In past years buyers used always to want a *shining, glossy* cheese, and this is not always easy to get in this province, as the poorer the milk the more *shining* is the cheese. But, nowadays, they begin to think that it is better to buy cheese rich in fat; so, generally speaking, on the market *shining* cheese is less sought after, because people now know that this kind is almost always poor in fat. At any rate, even were the quality as good, the producer loses in the quantity made.

*Mr. Barnard.*—Is the difference proportionate to the quantity of fat absorbed by the cheese? If otherwise, would it not, with milk of upwards of  $4\frac{1}{2}$  per cent. be better to make butter?

*Mr. Livingston* answered, but he spoke so low that the reporter could not catch all his words. He mentioned an experiment he had made on this matter with three vats in which he said he had put three different qualities of milk.

*M. William Parent.*—But if you put a rich milk in one vat and a less rich milk in another, the experiment could not be satisfactory.

*Mr. Livingston.*—Decidedly not, if I had only attended to the quality of the milk when I salted it; but I had to attend to the state of the milk when it arrived at the factory, I could not have found out without that whether the proportion of fat increased the quantity of cheese in the same proportion, because the different sorts of milk might not have been in the same condition.

*M. William Parent.*—I know of an experiment made on this matter. The maker tried taking the poorer milk to make cheese of it by itself. At the first test the same yield was got (*as from the richer milk? Trans*), but it was shown that the poor milk in question had been brought by patrons who had taken the greatest care of their cows, and on the other hand, that the richest milk had been furnished by patrons whose cows were very badly fed. The maker proved that the yield was as good from the poor milk, but he found also that the cheese from this milk had been the easier to make. He proved that the richer milk had been the more carelessly treated.

*Mr. Barnard.*—I think it is difficult to arrive here at satisfactory conclusions on this question. We ought, I believe, to investigate it seriously, for a discussion on vague *data* can lead to no result. In Messrs. Macfarlane and Livingston we have

<sup>(1)</sup> Prof. Van Slyke (Bulletin No. 62, N. Ser., p. 640), abridging his investigation of 1893, comes to the conclusion that:

The quantity of fat lost was utterly independent of the quantity of fat in the milk; and that the proportion of fat lost was greater when the percentage of fat in the milk was least, and that it (*the loss*) tended to diminish in proportion as the fat in the milk increased.

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men perfectly competent to conduct a careful, useful study of this matter, and I would suggest that we ask them to make this investigation. <sup>(1)</sup>

*M. Trudel.*—Apropos of investigations, I would suggest that one be made on frozen milk. This question has been agitated for several years, without result, and I ask if Messrs. Livingston and Macfarlane have hitherto made any experiments on it. I want to know if, when using frozen milk, as much fat can be got into the cheese as when using unfrozen milk. I fancied, when trying it, that the quality of the milk was as good in itself, but that in the making a good deal of fat was lost. I should like to hear Mr. Macfarlane's opinion on the point, if he has already made anything of it, and if not, I would propose that he investigate it with special care.

*Mr. Macfarlane.*—Last winter we received a great deal of milk at the St. Hyacinthe Dairy School, but not much of it was frozen. We received some, now and then, and made cheese from it; but some times it had been carelessly kept, and we had to refuse it, so it happened that we had no milk to make experiments with.

At any rate, from such experiments as we were able to make last winter, in making cheese from frozen milk, it resulted that the flavor of the cheese was inferior, but I must say that these experiments were not conclusive, because we had not enough milk to carry them out properly. So my opinion, once more, is that last winter we had not a sufficient quantity of milk, and what we had was, besides, not good enough to allow of our making a conclusive experiment.

*Mr. Barnard.*—I repeat that I do not think that we have sufficient information on this matter to enable us in this discussion to arrive at conclusive results. I would suggest to the School Committee to do what is necessary to give the professors an opportunity of making such investigation as shall enable them to give a decisive opinion on the use of frozen milk, not only in cheese, but in butter making as well. I have no doubt that if we obtain favorable results, if we succeed in making butter and cheese with frozen milk, it would suit a good many makers' purpose. I know that experiments on this point have been made already. Mr. Johnson, in 1881 and 1882, made a serious study of it at his own expense, and arrived at conclusions that I do not like to give by memory, but which, if my recollection serves me, were satisfactory. He seems to have succeeded perfectly in his attempt at elucidation; but that's no reason why we should not make the experiment ourselves. Our professors are competent men, and I suggest once more that we afford them an opportunity of making the requisite experiments.

*M. Trudel.*—If, for instance, a pound of fat must be lost (*per 100 lbs. of milk? Trans.*) in making cheese, if a pound of fat runs off with the whey, cannot it be used for making butter, instead of being left in the whey?

*Mr. Barnard.*—I do not like repeating myself. I think that the question deserves study, but I say again we have not yet studied it sufficiently to enable us to discuss it properly. For the patrons and makers it is a question of money. The

<sup>(1)</sup> See the tables of Prof. Van Slyke at the end of this volume.

point to decide is what we must do to make the most profit possible out of our milk, either by making cheese or by making butter. It is a question to be studied.

*Mr. Livingston.*—Undoubtedly it is a question deserving of consideration, and I am ready for my part to make a thorough investigation of it.

*Mr. Barnard.*—If you will allow me, I will submit to you another proposition. Might not the question be laid before one of those men who have recently experimented on these lines? To a man like Mr. Hoard, for instance. He told us, not long ago, that he used to make "hard cheese" that was worth but little, and which he had great difficulty in selling. Then, said he, I thought of trying another plan. Butter was worth then 30 cents to 35 cents a pound; cheese was worth 8 cents. I skimmed my milk, took all the cream I could get off it for butter, and I made all the butter I could; with the rest I made all the cheese I could.

Here is a man who must know thoroughly the best means of treating this problem. He says he skimmed all the cream off he could. It is true that this is by no means our own position; we must not forget this. For instance, here we have the county of Huntingdon, where the system Mr. Hoard talks of could not possibly be applied. In that county the milk delivered only contains 3 per cent. to 4 per cent. at most; but in other districts the average is as high as 4 to 4½ per cent. You see the difference, and you appreciate the importance of seriously studying out this question.

*M. Trudel.*—I think if the surplus fat cannot be got into the cheese it were more profitable to make butter. In the month of August I made from my own herd a pound of butter from 18 pounds of milk. My cows are little Canadian cows.

*Mr. Fisher.*—All the better for the purpose.

*M. Trudel.*—Suppose the case of milk of 5 per cent., is it not possible to remove 1 per cent. of fat and to make as good a cheese with this partially skimmed milk as can be made with milk of, say, 3½ or 4 per cent. (1)

*Mr. Livingston.*—It is my opinion, too, that you cannot succeed as well. (2)

*Mr. Barnard.*—I do not think that this case often occurs. We seldom see a vat of milk of an average richness of 5 per cent. It is true that this is sometimes met with; even 5½ per cent. occurs, but it is as an exception, not as a rule.

*Mr. Livingston.*—It is certainly the exception, and there are some of the pupils of the school here who can tell us the percentage we found in our vat last week.

*M. Dion.*—We had about 4.6.

*Mr. Livingston.*—True, we had as much as 4.6. And you must recollect that on the first day there was hardly any fat lost; the following day there was a great deal

(1) The prescription of the act on dairy products, 1893 (see p. 28 above), must not be forgotten when discussing cheese from partially skimmed milk.

(2) Prof. Babcock formally condemns partial skimming; in it he sees one of the causes of depreciation of American cheese. He advises butter to be made when the richness of the milk renders its making more profitable than cheese-making.

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more lost, because you cut the curd at 95°. You remember that I told you to leave the vat at 92°. and it was because you did not follow my instructions that such a quantity of fat was lost. But you found that no more fat was lost in making cheese from milk of 4.7 than was lost with milk of 4 per cent. The first day, with milk of 4.6, there was hardly any fat at all lost; we have even had milk as rich as 5 per cent., or nearly that.

*M. Taché.*—There cannot surely be milk of that degree of richness at this season?

*Mr. Livingston.*—I beg your pardon: I do not think I am mistaken.

*M. Taché.*—I know pretty well most of the places where dairying is practised; I know that as high as 5.6 per cent. has been found in the vat; but that was in August; except at that season, the vat has never given more than 4.5.

*M. Courchesne.*—In the month of November I tested the milk daily, and I found until very lately 4.7.

*M. St. Pierre.*—In November I myself found 4.8.

*M. Trudel.*—I found in the vat in October, milk of 5.2 per cent.

*M. Parent.*—Did you find that an average of the vat throughout October?

*M. Trudel.*—Yes; in the county of Champlain, I know personally, that has been produced from dry fodder. Even as high as 5.5 per cent. of fat has been reached. We got this as the average during some time. In a similar case, I do not think it would do any harm to take a pound of butter from a like quantity of fat, because all the fat could not be incorporated with the cheese.

*Mr. Fisher.*—As Mr. Barnard says, I think it would be better to investigate the question thoroughly, since we can hardly arrive at a conclusion without having dived into it deeply. Two of the chief authorities on dairying have studied the question. Dr. Babcock and Prof. Van Slyke have been investigating it for the last two years. The results of their studies have been published, and Dr. Babcock asserts that six per cent. of fat can be made to incorporate itself with the cheese. I do not suppose that everybody will agree with this assertion; and therefore I say again it would be wise to submit this question to investigation.

*M. Veilleux.*—I think that cheese thus made from milk, partly deprived of its fat for butter-making, would give you, thirty days after it was made, a loss of weight proportionately larger than a cheese made from whole milk.

*M. Brodeur.*—All this is matter for investigation, and it is the business of our dairy school to study it out.

*Mr. Fisher.*—It is certainly necessary to make more accurate experiments in order to know what to trust to in this matter, and I think it is the duty of the school to make them, for it was for this purpose it was established. In the school we have competent men to undertake the task, and to none other than competent men should it be entrusted.

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REPORT OF THE COMMITTEE APPOINTED TO STUDY THE QUESTION OF PAYING FOR  
MILK ACCORDING TO ITS RICHNESS.

*Mr. President and Gentlemen:—*

The committee named to consider the best mode by which expansion of the system of payment for milk by fat-test may be encouraged, begs to report :

That we believe it to be of the utmost importance to the dairy industry to have this system adopted in our factories as extensively and as rapidly as possible, inasmuch as it will contribute greatly to the general improvement in dairying. It will induce an increased study and exactness on the part of the makers. It will elevate the standard of their efforts among the patrons, for it will induce them to aim at quality instead of quantity. This will act on their work all through, inducing a better choice of cows, a greater attention to the comfort and the feeding of them, which again will result in better buildings and greater attention to cultivation of the crops best adapted to the complete nourishment of the herd. This strife for quality will react on the farmer and exercise his higher intelligence ; will make him a better dairyman and a better citizen.

We find that already during this season a number of factories have been operated on this plan with complete success, and that nowhere has an honest attempt to carry it through resulted in failure. Mr. Taché has managed 12 butter factories under it with complete satisfaction to all concerned, and Messrs. McPherson & Ferguson, in Huntingdon, have had 11 cheese factories under it with equally good results.

*Third.*—We find that in a number of syndicates the inspectors have been able, in addition to performing their ordinary labors of inspection and instruction, to make the tests of milk necessary for the operation of this system in a few of their factories, and have done so without extra charge or too onerous labor. Notably in Shefford, Mr. G. Ferguson did this for one very large creamery and an average cheese factory all through the season, and in another cheese factory for part of the season, equal in labor to three average factories the whole season ; and Mr. Lloyd, in Huntingdon, did it for one creamery and one cheese factory the whole season.

*Fourth.*—We find that, whenever this has been done, the inspectors report a decided improvement in the quality of the milk, occasioning a greater production of butter or cheese per hundred pounds of milk, and consequently a greater profit to the maker and the patrons.

We therefore recommend :

That a bulletin be prepared at once, so that it may be available for use and distribution at the meetings which will be held during the winter, for the formation and organization of syndicates. In this bulletin should be set forth these resolutions and a statement of all the facts obtainable which support and endorse these views ; that to this end an immediate demand be made on our inspectors, general and local, and our factorymen to send in reports of the operation of factories under this system

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during the past season, with comparison of the work of the last season under the old system ;

That all our inspectors and those engaged in organizing syndicates be urged to put these facts most carefully before the factorymen and patrons with whom they come in contact.

Further, we recommend that our inspectors should, the coming season, be urged to undertake this work of making the test in a reasonable number of their factories during the season, when so requested, for the purpose of facilitating the introduction of the system and affording an object lesson to the members of the syndicate ; and we further make suggestion : That if all the factories of a syndicate agree, or if a sufficient number agree, say 12 or 15, that there are two ways in which this system may be economically and successfully carried out, namely : *first*, that the inspector may engage a cheap assistant and then be able to carry on this work without interfering with his inspection and instruction for 12 to 20 factories ; *second*, that a special tester be engaged, and all the composite samples sent to him at a central point to be tested and the dividends made up, when such tester, with a washerwoman and a boy, ought to be able to serve about 40 or 50 factories, or two or three syndicates. In this case the inspectors would have nothing to do with the testing, and should be able to properly inspect and instruct 20 or 25 factories.

We further recommend that the officials of the association and the syndicates be requested to make special note of all experiences in connection with this system during the coming season, and report them with the greatest care and detail for our guidance in the future.

*Mr. Fisher.*—Gentlemen, you have just heard the report I read to you. I must impress upon you that no one is bound by the resolution of the committee. You are simply asked to do this or that thing ; you are not compelled to do either, but I think I may say that it would at any rate be wise to study the principle laid down in this report. Besides, we have the experience of the United States on it. It is a question of interest for us to study the best system to be adopted. We need all possible information, and, to obtain that, everyone must put his hand to the plough.

The inspectors can do a great deal, but I think they ought not to have more than 20 factories each to visit. If there are 30 in one circuit, one inspector would not be enough. I should prefer there being two, that their work might be made less burdensome to them.

The report of the committee was unanimously approved.

*Mr. Fisher.*—Before quitting the question and closing the session, I ask the inspectors present to send as soon as possible to the committee all the information they gathered on this subject last season. They must now be able to tell us what results were given last season by the system of paying for milk according to its richness. It would be very useful to us to have this information as soon as possible.



FIFTH SESSION OF THE CONVENTION.—THURSDAY, DECEMBER 7TH, 9 A.M.

LECTURE BY PROF. ROBERTSON,  
DOMINION COMMISSIONER OF DAIRY INDUSTRY.

*Mr. President and Gentlemen :*

After the disappointment of several years, I am happy to find myself able to attend the annual convention of the Dairy Association of the Province of Quebec.

For a long time I have recognised the splendid service which this Association has rendered to the people of this province.

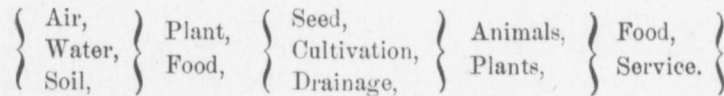
Very great progress has been made in agriculture, and particularly in the dairying branch of agriculture, during the past few years; and I do not know of any part of Canada where so much progress in the extension of the business of dairying, and in the improvement of the quality of dairy products, has been made during the past five years as in this grand old Province of Quebec. I think I am correct in saying that a very large measure of that progress has been due to the existence and labours of this Association and of the public spirited and capable men who have been identified with its work.

I do not know that I have much which is entirely new to present to this convention; but I may be able to present, in a new form, truths which have been pressed upon your attention for acceptance many times in the past.

The more the farmers of Quebec recognise the importance of the dairy industry to them, and its power to bring them good times in their calling, the more speedily will they make the best use of the opportunities and resources which surround them.

This is essentially an agricultural province, and agriculture must be the main source of its wealth. The sources of wealth may be briefly set forth in the following chart which I present for your study :—

SUN.



MAN.

The sun is the source of all heat on the earth and provides much of the wealth which is produced in the form of plant and animal products. As an individual may wind a small portion of his own strength into the spring of a watch and thereby make provision for the regular movements of its works, in order to inform him of the progress of time, so the sun, streaming his warmth and strength on a growing corn stalk, may use it as the contrivance into which he can roll part of his own strength and heat. When the cow consumes the corn stalk, the energy of the old sun warms the cow, supports her life and furnishes part of the materials for the supply of milk. Out of the atmosphere, plants obtain, in most cases, 95 per cent. of the

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total substance which they contain. This would indicate to farmers the desirability of growing fodder crops and other plants in such a way, as to permit the free circulation of air and the abundant admission of sunlight on their leaves. A crop of Indian corn grown in rows three feet apart, with the stalks not closer than from four to six inches in a row, will give a better yield of good fodder than a crop grown from the sowing of three bushels or more of seed per acre.

This other chart indicates that the highest and most profitable methods of farming are those which enable the farmer, through agents or agencies of sun, air, water, soil and intelligent labour to provide for himself abundant crops of nutritious plants and thereby improve the quality of the products of animals fed upon those plants, which he can exchange at the best advantage for other commodities which he may desire to possess. At the present time, with the keen competition which meets the farmer from all countries, the farmer must needs study to provide those products which he can exchange for such things as clothing, groceries, furniture, etc., with the greatest advantage to himself. The crude and primitive products of agriculture, such as cereals, have fallen in price very much during recent years. The wonderful development of railways, steamships, telegraphs and newspapers, has brought the coolie of India into direct competition, with his wheat, with the farmer in Canada. In order to lift himself out of competition with the low priced labour of such countries as India and Russia, the Canadian farmer must produce and sell those products which require the exercise of intelligent skill on his part for their production. Such products are butter, cheese, bacon, beef, mutton, poultry, eggs, etc. Again, in the sale of animals and their products, the farmer does not exhaust the fertility of his farm as quickly or to the same extent as if he sold grain or hay.

The following chart shows the quantity of nitrogen, phosphoric acid and potash which are removed by the sale of one ton each of certain products:—

NITROGEN, PHOSPHORIC ACID AND POTASH IN ONE TON EACH.

	Nitrogen. Lbs.	Phosphoric Acid. Lbs.	Potash. Lbs.
Wheat.....	41·6	15·6	10·4
Barley... ..	32	15·4	9
Oats.....	38·4	12·4	8·8
Pease.....	70·6	17·2	19·6
Beans.....	81·6	23·8	26·2
Indian Corn.....	32	11·8	7·4
Hay.....	31	8·2	26·4
Clover.....	39·4	11·2	36·8
Potatoes.....	6·8	3·2	11·4
Fat Cattle—alive.....	50	31·2	2·8
Fat Sheep—alive.....	44	22·6	2·8
Fat Swine—alive.....	34·8	14·6	2
Cheese.....	90	23	5
Milk.....	10·2	3·4	3
Fine Butter.....	·5	.....	.....

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## CHEMICAL COMPOSITION OF MANURES.

*Pounds per Ton.*

Species.	Per Ton.	Nitrogen. lbs.	Phosphoric Acid. lbs.	Potash. lbs.	
Horses..	Dejections..	{ Whole.....	6	3	5½
		{ Liquid.....	15½	1-16	15
		{ Solid.....	4½	3½	3½
Cattle...	"	{ Whole.....	3½	1½	4
		{ Liquid.....	6	1-16	5
		{ Solid.....	3	1½	1
Sheep...	"	{ Whole.....	8½	2½	6½
		{ Liquid.....	19½	1-8	22½
		{ Solid.....	5½	3	1½
Swine...	"	{ Whole.....	4½	2	6
		{ Liquid.....	4½	½	8½
		{ Solid.....	6	3½	2½
Poultry.....		16½	15½	8½	
Mixed Farm Manure.	{	Fresh.....	4½	2	5
		Rotted.....	5½	3	5

The Nitrogen on the chart was represented by red lines, one inch per lb.

The Phosphoric Acid by brown lines, one inch per lb.

The Potash by green lines, one inch per lb.

This other chart shows the quantity of these same substances which are returned to the soil by the manure of domestic animals. In brief, it may be said that when cattle and swine are fed on crops, not more than fifteen per cent. of the elements of fertility in the fodder which they consume are removed from the farm in their products or in their carcass. That leaves about eighty-five per cent. of the elements of fertility which the original crops took from the land, to be restored to it in the form of manure. This is no new gospel, but it is one which must be repeated over and over and impressed deeply on the minds of the farmers who own the rich heritage of land in this province. It must not be robbed of its fertility and left exhausted and barren for coming generations, but must be protected in as great or a greater state of productiveness than it was originally, by the intelligent labour of men who follow mixed or dairy farming.

To provide cheap and suitable fodder for the feeding of cows in the autumn and during the winter months, farmers must more generally grow large areas of Indian corn.

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I may be permitted to repeat what is known to many of you who have had experience in growing this crop, that it is desirable to select only those varieties of Indian corn which attain a stage of growth when the ears will be fit for table use, and which will give the largest weight per acre of corn in that stage. Corn should be planted in rows three feet apart, with not more than one grain every four to six inches in the row. Or it may be planted in hills three feet apart both ways with four to six grains of corn per hill.

While near Montreal, last autumn, I saw fields of corn, where the men had wantonly thrown away  $2\frac{1}{2}$  bushels of seed to the acre—perhaps they were benevolently inclined towards the seedsmen. When the corn-stalk has not room enough, the green colouring matter <sup>(1)</sup> is less active, and does not take in the carbon for the gum, starch and sugar. The corn-stalk serves the farmer in proportion as he gives it a chance—rich, warm soil and plenty of room.

This chart is for the purpose of showing you the comparative value of corn-stalks cut on the 25th August and the 19th of September. It is taken from the work of Mr. Frank T. Shutt, chemist at the Central Experimental Farm. When cut on the 25th of August every ton of the crop had of digestible matter 249 pounds; when cut on the 19th of September every ton of the crop contained 297 pounds of digestible matter.

INDIAN CORN—DIGESTIBLE MATTER PER TON OF GREEN FODDER.

ELEMENTS.		CUT.	LBS.	VALUE.
Average of 7 Varieties.	Total digestible matter.	August 25.....	249	
		September 19.....	297	
	Albuminoids.....	August 26.....	25	
		September 19.....	27	
	Fat.....	August 26.....	3	
		September 19.....	5	
Fibre.....	August 26.....	77		
	September 19.....	89		
Carbo-Hydrates.....	August 26.....	143		
	September 19.....	175		

In every ton of green fodder there were in the first stage 249 lbs. of digestible matter, and in every ton at the other stage there were 297 lbs. These are the con-

<sup>1</sup> Chlorophyl is only developed under the influence of light. Under the effect of light, the green leaves absorb carbonic acid, appropriating the carbon and rejecting the oxygen. Deprived of light, leaves do not become green, and do not appropriate carbon; the less they are exposed to light, the less greeny and efficient are they.

<sup>2</sup> These lines are only proportional in pairs, and only as regards the elements. Compared singly one with the other, at the dates of the two experiments of Mr. Shutt.

id.	Potash. lbs.
	5½
	15
	3½
	4
	5
	1
	6½
	22½
	1½
	6
	8½
	2½
	8½
	5
	5

h are returned said that when the elements of a in their pro- he elements of it in the form ated over and ch heritage of exhausted and greater state an who follow e autumn and eas of Indian

stituents: Albuminoids, fat, fibre and carbo-hydrates. Of these the albuminoids are the most valuable constituents, corresponding to the fibrin of beef or the albumen of eggs. At the first period there were 25 lbs. of albuminoids as against 27 in the latter. Of fat there were 3 lbs., as against 5 lbs.; of fibre the proportion was 77 to 89; of the carbo-hydrates there were 143 against 175. The teaching of the whole thing is, that every ton is worth more at the latter stage, and you have more tons to the acre. This lower chart will illustrate these points still more clearly. It is taken from the average of five varieties of Indian corn at these stages.

INDIAN CORN—YIELDS PER ACRE:

Tasselled, July 30.....	{	18,045 Green weight.
		16,426 Water.
		1,619 Dry matter.
Silked, August 21 .....	{	25,745 Green weight.
		22,666 Water.
		3,079 Dry matter.
In milk, August 9.....	{	32,650 Green weight.
		27,957 Water.
		4,693 Dry matter.
Glazed, September 7.....	{	32,295 Green weight.
		25,093 Water.
		7,202 Dry matter.
Ripe, September 23.....	{	28,460 Green weight.
		20,542 Water.
		7,918 Dry matter.

Most of the gentlemen of the convention will understand that there are several distinct stages in corn growth. For the sake of convenience we speak of the later stages in the following terms:—First we have the “tasselling;” then you have the “silking,” when the silk threads come through the husk; then there is the stage when the corn is in “milk”; after that is the stage when the kernel is “glazed” on the outside; and lastly you have the “ripe” stage, when the plant is matured. At the “tasselled” stage there were 18,045 lb. of green corn to the acre. In these 9 tons and 45 pounds there were 8 tons and 426 lb. of water; so that we had only 1,619 pounds of dry matter. The dry matter is all that is valuable. It is not equally digestible in all its stages, but still it must be there to be available. At the “silking” stage there was great increase in the dry matter, and so all through, as shown by the diagram in the chart. If you put it down in dollars and cents, the difference would be this: that if it be said to be worth \$16.19 per acre at the first or “tasselling” stage, the same crop is worth \$72.02 per acre at the latter or “glazed” stage, and there is no increase in the cost of production between that stage and this. The man does not put an extra ten cents to the acre. The extra digestible constituents are largely taken from the atmosphere. So you will see the great importance of growing corn for ensilage purposes to the “glazed” stage. We have been urging

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everywhere, for the last two years, that farmers should grow corn so that it may reach this stage.

The corn at the "glazing" stage has the largest quantity of food value in itself, and it is then in the most digestible condition.

In our work on the Experimental Farm in 1891, we compared four varieties of corn—"Thoroughbred White Flint," "Red Cob," "Longfellow," and "Pearce's Prolific." At the "tasselling" stage we realized per acre of dry matter—not all digestible—but dry matter, 6,468 lb. We realized at the "silking" period from the same varieties, 7,770 lb. At the "early milk" stage we realized 9,138 lb.; at the "late milk" stage, 9,467 lb.; and at the "glazing" stage, 11,298 lbs. I want to read these figures to you to make an impression on your mind with regard to the advantage of cutting at the late stage. There was nearly double as much dry matter per acre at the "glazing" as at the "tasselling" stage, and you cannot get corn to the "glazing" stage by sowing it broadcast.

I wish to give a further illustration, by taking Indian corn on an average of five trials. The stage of growth from 24th July to 5th August, at different experimental stations, reached the condition from the "tasselled" stage to the "bloom" stage. First we may take the quantity of dry matter per acre at these two stages. The diagram that I have prepared to illustrate these points is as follows:

24th July to	{	Tasselled to bloom.	{	Dry matter.....	10	inches long
5th Aug,				Albuminoids ... ..	10	do
				Fat.....	10	do
				Carbo-hydrates.....	10	do
3rd Sept. to	{	Glazed to Ripe	{	Dry matter.....	30.5	do
23rd Sept.,				Albuminoids.....	21.4	do
				Fat.....	33	do
				Carbo-hydrates.....	36.5	do

I need hardly emphasize still further the fact that no additional expense is involved in producing a crop to the later or glazed stage; the work is all done and the outlay has all been made before the crop reaches the tasselling period.

The silo will not grow a crop of corn. If you put it at the "glazing" into the silo, it will give you a large quantity of feed, but at the "tasselling" stage it will give you an expensive way of watering cows.

I fear I have encroached on the time of the other speakers, but I wanted to show you that ensilage is the cheapest food for cattle, and also to show you how this association might help the prosperity of Canada, by instructing farmers how to make ensilage in the best way. I will give you a few more words on the feeding value of it. I have given you one instance from the feeding experiments which I quoted.

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 THE ROBERTSON MIXTURE FOR ENSILAGE.
 

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Ensilage has come to mean any kind of fodder which is cured and preserved in a succulent state for the feeding of domestic animals. The silo has no power to add any nourishing qualities to the fodder which is put into it for preservation. Its contents may become more digestible and palatable by the changes which proceed slowly under the action of ferments, or they may become less pleasant and wholesome if fermentation goes too far. Fodder which is deficient in nutrients before it is put into the silo, will experience no regeneration there. Degeneration into offensive material is the only and constant tendency, and that can be arrested.

To prevent deterioration and decay is the function of the silo, and to that end it should be constructed to exclude the atmosphere. To do so requires the use of building material of adequate strength. The fastening of its parts, at the foundation and at the corners of the silo, should be secure. I have found one ply of sound one-inch lumber, tongued and grooved, nailed horizontally on the inside of studs of the size of two inches by ten inches, or two inches by twelve inches, to be sufficient.

Indian corn—the great sun plant of this continent—is undoubtedly the most serviceable crop which has been used for ensilage, but although it be ever so well preserved as to succulence, odour, flavour and colour, it is an incomplete food for cattle. With a marvellous proclivity for storing up starch, gum and sugar out of the elements of the air, the corn plant becomes a veritable accumulator of sun-strength and energy in its carbo-hydrates or heat-producing parts. These latter are present in no mean quantities in fodder corn per acre; but, for a wholesome economical, complete food, they are out of correct proportion to the other constituents.

A main function of intelligent men on earth seems to be to put and keep things in their right relationship to each other, and therefore the intelligent farmer has been putting carbo-hydrates and albuminoids, in the rations for his cattle, in the right relationships and proportions to each other—even at the expense of his purse. That has been done commonly by adding ripened grain, such as oats, barley, wheat and pease, to the bulky fodder part of rations, or by buying for that purpose oil-cake, cotton-seed meal, or some other feeding commodity which is rich in albuminoids.

For a few years I have been seeking to find and put into the silo, with Indian corn, some other plant or plants which would furnish the necessary quantity of albuminoids in a form which would cost very much less than ripened cereals or concentrated by-products. Clovers and pease have been tried with indifferent success, and the climbing or pole beans have been grown, with corn stalks for trellis, without appreciable advantage.

The horse bean or small field bean (*Faba Vulgaris*, var. *Equina*) seems to meet the needs of the case. This plant grows with a stiff, erect stem of quadrangular shape. It attains here a height of from three to six feet. It bears pods from within

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six or eight inches from the base of the stalk to near its top. The ripened beans are of a greyish-brown color, and of an oblong, round shape about half an inch in long diameter and about three-eighths of an inch in short diameter.

With us the plants have carried ripened beans in the lower pods, while the top-most ones on the stalks were hardly out of bloom. By growing the horse beans as a fodder crop, in rows three feet apart, with three or four plants per foot in each row, we obtained, in 1892, an average yield of six tons, 1,610 pounds per acre of green fodder. Representative samples of the crop were analyzed by Mr. Frank T. Shutt, chief chemist of the Dominion Experimental Farms, and from his analyses it is established that the horse beans contained 370 pounds of albuminoids and 94 pounds of fat per acre. They were preserved in a silo in a layer by themselves, and also in mixture with Indian corn plants, and, moreover, were grown in the same rows with Indian corn, the beans and corn being mixed before they were put into the planter. It will suffice at present to say that the cattle relished the Indian corn and horse beans ensilage.

Although albuminoids and carbo-hydrates (in the form of starch, gum, sugar and fibre), may be contained in an Indian corn and horse bean mixture in nearly correct proportions, it is still an incomplete food, from deficiency in fat.

The sunflower (*Helianthus annuum*) grows luxuriantly over the whole of the temperate zone of this continent, and the seeds contain a large percentage of fat. The variety known as the "Mammoth Russian" was grown in rows three feet apart, with the plants from three to eighteen inches distant in the rows. There did not appear to be any appreciable difference in the weight of the crop per acre, where the plants were grown close or more distant in the rows. They yielded at the rate of seven and a half tons of sunflower heads per acre. From the analyses made by Mr. Shutt, it was established that they contained 352 pounds of albuminoids and 729 pounds of fat per acre.

A group of milking cows are being fed on a ration, of which the ensilage part is made from mixing the heads of sunflowers from half an acre with Indian corn fodder from two acres. The cows of another similar group are being fed upon a like ration, of which the ensilage part is from Indian corn alone, with two pounds of grain per head per day more than is allowed the cows of the former or sunflower group. The milk from the two groups is set in deep setting pails in ice water under the same conditions, and the following results are apparent from an average of nine tests:—

	From ration with Sunflower Ensilage.	From ration with ordinary Indian Corn Ensilage.
Percentage of fat in skim milk.....	.35	.51
Churning period, minutes.....	30.	20.
Percentage of fat in buttermilk.....	.25	.40

The butter from the cows which are fed on the ration with sunflower ensilage has a richer flavour and a slightly higher color than that from the other lot.

The sunflower ensilage has developed a most agreeable odor, and the cattle are greedily fond of it.

Besides the points which have been mentioned, it should not be overlooked that horse beans belong to the family of plants which have the faculty of appropriating free nitrogen from the atmosphere for the formation of the albuminoids which they contain. It is possible to increase the fertility of the soil rapidly and to a remarkable degree, by growing the crop and feeding it to the dairy or fattening stock. Protection to the land and profit to the pocket of the farmers are the two fruits to be expected. These form a capital combination for Canadian farmers, and no personal proprietary right restricts the use of it.

For the growth of this mixture hereafter I recommend the corn, horse beans and sunflowers to be planted in the following proportions: One acre of Indian corn planted in rows three feet apart, half an acre of horse beans planted in rows three feet apart, at the rate of two-thirds of a bushel of seeds per acre, and a quarter of an acre of sunflowers planted in rows three feet apart, with from one foot to a foot and a half between the plants in every row. The sunflowers should be planted as early in the summer as possible, and if they come up thicker at the rate of one plant at every foot in each row, they should be thinned out in each row. The heads only are to be used in the silo. The horse beans may be planted from two to three weeks later than the corn. The crop from all three plants should be mixed and put into the silo together.

I have time to devote only a few words to the management of dairy cows. The most valuable and important characteristic of a dairy cow may be spoken of as a good constitution. By the term constitution I mean the power to continue in good health, perform the functions of life and render a good service. There are many points which indicate the possession of a good constitution by a cow, but I take time to refer to only one of them. The mellow skin is one of the most desirable points in a cow. It may be spoken of as an organ, since the skin which covers the outside of the body passes over the inside and forms the stomach and intestinal canal. For the preservation of the skin of the cow in a healthy condition, succulent feed is desirable and necessary. The crying need of the dairy cows of Quebec at the present time, is the supply of the succulent and juicy food for the winter months. That can be provided most cheaply in the form of Indian corn ensilage, or the "Robertson mixture for ensilage" of which I have already spoken. The growing of roots is also a good method of providing succulent food for the dairy and fattening cattle. Comfortable stables are another need of the dairy cattle of this country. The stable should be warm, clean and light, and an abundance of pure air should be supplied and the cow should have access to salt.

By feeding his cows in a manner similar to that which I have outlined, with attention to all little details of practice, Mr. James Witton, of Wellman's Corners

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Ont., sent to the cheese factory during the summer of 1892, no less than 6,093 pounds of milk per cow in a period of six months. His cows were selected and well cared for for several years. His is a most exceptional instance, but it illustrates what can be done with good cows which are well kept. During the season of 1892, for the milk of some seven and a half months, he realised from the milk of his eight cows \$505 from the cheese factory, and in addition to that we paid Mr. Witton the sum of \$193 during the remainder of the twelve months, for the butter which was made from the milk of the same cows during the winter at our butter station, which had been started in the premises where cheese making had been carried on during the summer.

The shortness of the time at my disposal will permit me to make only a few remarks on the handling of the milk of cows.

The utmost cleanliness should be observed in milking the cows, and it will be found advantageous to milk the cows with dry hands rather than with the hands wet by milk.

Tin pails only, and those perfectly clean, should be used. In the preparation of milk for cheese making, it is advantageous to aerate the milk, by dipping, pouring, stirring or running it through an aerator in a pure atmosphere. The milk should be left only in a place where the surroundings are clean and wholesome without prevalence of any offensive smells. Every patron of a cheese factory should send to the factory milk without adulteration. In order to give fair play to the several patrons I advise that milk be paid for according to its quality. When that is done, the temptation to remove cream or to put in water is almost entirely taken away. Human nature in Quebec is very much like human nature in any part of world. It is susceptible to the influence of any practice which is found to be profitable. The testing of milk and the payment for it according to the quality, will show that it is most profitable to send pure, honest, rich milk to the factories.

To the cheese makers who are present a few words may be addressed. Every cheese maker should be ambitious to become an educator towards better efforts in farming and dairying in his locality.

The details of cheese-making are fully taught in the dairy school at St. Hyacinthe, and I will confine my remarks to a few points which are apt to be neglected.

It is not consistent for the cheese maker to scold and berate the patrons of his factory for having dirty milk cans and untidy surroundings when the weigh-can, milk-cans and floor of his own factory are not perfectly clean. The cheese maker himself should be a living example of cleanliness in all his surroundings. Nothing is more detrimental to the making of uniformly fine cheese than untidy cheese factories, where the inside and outside vie with each other in offensiveness.

I am glad to be able to report to you that there is a very great improvement in the cheese factories in the province, and I wish to urge upon the cheese makers of the French speaking districts, as well as of the English speaking districts, that

they should maintain the reputation which the Anglo-Saxons and Normans have for cleanliness and good taste.

The cheese and boxes should be finished with a neatness of appearance which make them attractive in the eyes of any buyer. Cheese of which the rinds are cracked or which are not finished with good workmanship on the very edges, will fetch less money than cheese of similar quality put up in neat form. The boxes should be strong and close-fitting; and where stencils are used they should be neat and put on carefully.

The following chart shows the gain which will result to farmers from sending the milk from cows which have been milked for several months, to a creamery in preference to setting it at home for making butter :

EXPERIMENTAL DAIRY. CENTRAL EXPERIMENTAL FARM, OTTAWA.

*Average results from 7 tests.*

Milk set in deep pails in ice water for 22 hours.	Per cent of butterfat in				Pounds of butter per 100 lbs. of butter fat
	Whole milk	Skim- milk	Butter- milk	Not re- covered	
From cows milking more than 6½ months .....	3.67	1.43	0.40	32.55	80.91
Do milk from one fresh cow .....	3.58	0.55	0.40	14.00	103.29
From cows milking less than 6½ months .....	3.56	0.21	0.35	6.34	114.85

Winter dairying should be followed more generally in the Province of Quebec, and I think it should take the direction of butter making during the winter in the same premises where cheese making has been followed during the summer. In many cases the farmers are disgusted with the task of winter chores which leave them no direct profit. The feeding of milking cows during the winter would bring in a revenue at the time of the year when the food of animals costs highest. It would also enable the farmers to get profitable returns out of the capital which they have invested in cows, barns and lands. Besides, a cow which is milked for ten months or more in every year will give a much better flow of milk than one which is milked only seven months, and lived for the other five months in the year without paying her board to the man who keeps her. During the winter months, milk and its products sell for high prices by the pound, and the by-products of skim-milk and butter-milk are then most valuable for the rearing of stock and the feeding of young pigs.

In conclusion I may add a word on butter-making—the details of this art are taught thoroughly at the dairy-school at St. Hyacinthe, and I commend it to the hearty support of the butter and cheese makers.

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I desire to refer to a few matters to guard butter makers against falling into wrong practices. In the care of the cream, care should be taken to prevent it from clotting, and to prevent a scum or skin from forming on the surface by evaporation. If this be permitted clots of cream are apt to find their way, unbroken, into the butter tub making it full of unsightly specks, which lessen its value very much.

Pure clean salt of fine and uniform grain only should be used. A complaint was made at the World's Fair that Canadian butter suffered very much from a fishy flavour, and odour said to be due to the quality of the salt which had been used. I fear that in many cases the salt is exposed to all kinds of noisome and foul odours before it is added to the butter. Even such a preservative as salt may become the means of introducing into the butter most injurious taints and bad flavours. When salt has been exposed to any foul atmosphere, I think it may be safely heated to 180 degrees Fahrenheit, and afterwards cooled before it is put with the butter. If the butter be packed, the tops of the packages should be finished with the utmost care, leaving a perfectly smooth surface.

Attention to these small matters will enable the dairy-men of Quebec to win larger profits to themselves, obtain more pleasure in following their calling, and assist still more largely than they have done in the past in building up the prosperity of this province and the Dominion of Canada.

#### CHEESE-MAKING ON SUNDAY.

*The President.*—I should like to submit to you a question of a special kind. It is said that in some parishes cheese is made on Sunday-afternoon. We do not do so; cheese is made with us on Saturday evening so as to finish during the night or very early on Sunday morning. The Sunday is sometimes infringed upon, because when once begun, it is impossible to stop the making, but the milkings of Sunday, both morning and evening, are reserved till Monday morning, and the plan is found to work well. I have never seen cheese made on Sunday anywhere, but it is said to be done, and more, it is said to be unavoidable.

What leads me to raise the question, is that in my opinion it is important that we should work together for our moral as well as our material benefit, and that is why I seek for your opinion as to whether it is expedient or necessary to make cheese on Sundays.

*M. Plamondon.*—I think the question should be left to the decision of the clergy. We, who are not learned in theology, are not competent to decide it. For my part, I am sure that I never postponed taking my milk to the factory to the Monday, without losing the milkings of Sunday, both morning and evening.

*The President.*—It is not essentially a question of theology. We are simply discussing between ourselves if, yes or no, the making of cheese on Sunday is unavoidable. What do you say, Mr. Lambert?

*Mr. Lambert.*—As for me, Mr. President, I do not think it necessary. I know it is done in some factories, but I see no danger of loss if cheese is made Saturday

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night and Monday mornings. If all patrons would agree to take real care of their Sunday milk, no one would lose by it. Besides it is done in many places and no complaints are heard.

*The President.*—Then you do not think that it is necessary, in the interest either of the patrons or the makers, to make cheese on Sunday.

*M. Plamondon.*<sup>1</sup>—I do not see that it is necessary. The patrons cannot require it of the makers, neither can the makers from the patrons. It is clear that milk can be kept till Monday morning, and even if it does not keep well enough for the factory it can always be used in other ways. I myself use it all; I use it in my family, or I make butter from it, so I have no reason to require my maker to make cheese on Sundays.

*The President.*—May this be taken to be the general opinion?

*Many Voices.*—Yes, yes!

*The President.*—I propose, then, after this discussion, that it be resolved that the members of the Dairymen's Association, without wishing to condemn any one, do not think that it is necessary to make cheese on Sunday.

*The resolution was passed unanimously.*

#### DISCUSSION ON SKIMMING AND ON AERATORS.

*M. Dallaire.*—I wish to call the attention of the members of the association to a rather important point, if I am to judge from the divergent opinions held on the subject by butter makers; I mean the skimming of milk. Some makers say that a small quantity of fat should always be left in the milk; others hold that it should be skimmed clean. According to the former, the *fibrin* is found in the *centrifuge* (separator) between the cream and the skim-milk, and they hold that, if the whole of the cream is taken, the fibrin, instead of remaining in the skim-milk, passes off with the cream, and prevents, in churning, the globules of butter from detaching themselves perfectly.

This is an important subject of inquiry; for, on either side, there must be a serious inconvenience. I am not a butter-maker, but I find that there are varying opinions on this subject, and I should like to know to which side the members of this association incline. The society should have experiments made to determine it.

*M. Saül Coté.*—It is well known that if you take only the richest part of the milk, you will have a superior quality of butter; but the question is, will you make as much profit? In my opinion, if you want the greatest profit, you must skim as clean as possible; but if you only seek to make the finest butter, only take the *crème de la crème*.

*M. Lambert.*—Do you think that by skimming less closely a greater yield of butter, considering the quality of the cream employed, can be obtained?

<sup>1</sup> Should not this be M. Lambert? M. Plamondon just now said—*v. supra*—that he never reserved his Sunday's milk till Monday morning without losing it.—A. R. J. F.

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*M. Saül Coté.*—I do not think so.

*M. Lambert.*—Still, the opinion has been promulgated.

*Mr. Barnard.*—I have always found that, if the skimming is well done, there will be a greater yield without the quality suffering; and I believe that deep (thorough) skimming, even very deep (thorough), may be practised, without injury to the quality of the cream.

*M. Saül Coté.*—Mr. Barnard holds that by skimming as closely as possible the quality of the cream is not depreciated; I hold the opposite opinion.

*Mr. Barnard.*—Of course, it is a matter of opinion, but I cannot understand how you can take the richest cream and leave the poorer behind. I do not know if it is meant to be done with a separator; if so, I do not think it can be done to advantage; I do not believe the two qualities of cream can be separated.

*M. Saül Coté.*—I assert that it can be done as well by a separator as in a pan; it is the best cream that comes first; it is the richest cream that rises first to the surface. There must be a difference in quality between the two.

*Mr. Barnard.*—Our opinions decidedly differ on this point. According to my notion, cream, being lighter than milk, cannot do otherwise than separate from the milk as a whole and not in part.

*M. Dallaire.*—A maker of repute told me that he has observed that when he skims less thoroughly he finds a smaller proportion of fat in his milk, which is as much as to say that in skimming less thoroughly the globules of fat separate themselves less freely; and this brings us back to the part played by the fibrin in preventing the globules of fat from detaching themselves perfectly from the rest. It seems to me that there certainly is something that hinders these globules from separating completely from the rest, and I think that this is an important subject, one that needs elucidation as soon as possible, because it is known that a difference of opinion exists between makers on this point.

*M. Saül Coté.*—I think that the *aeration of milk* is a necessary operation. It can be done with an instrument that costs but a trifle. *Aerators* cost at most \$2, and some are to be had for 75 cents. If our syndicates could get all the patrons to use them, I think it would pay us well. The instrument is indispensable to the making of good butter and cheese. I know that there are instruments sold in Bagot for 75 cents each that do good work, and I call upon M. Chicoine to testify in their favour; he can give you his opinion about them.

*M. Chicoine.*—It is a very simple thing; the price of it is reimbursed in a month.

*M. Saül Coté.*—I will not say which is the best kind of aerator; they are all good, and we have the experience of several makers in their favour. We shall have, too, the opinion and experience of the Experiment-farm, to which we have written, but, as yet, have had no reply. At any rate, I have seen some of them at St. Hyacinthe and elsewhere, and they seemed to cool down the milk to the right degree very successfully. Those that I speak of are attached to a sheet of tin, and very easily kept

clean. Others there are of a different construction, but I do not recommend one more than another, for they are all good.

*M. Plamondon.*—You have an instrument that will allow of the milk being kept at a sufficiently low temperature ?

*M. Saül Côté.*—Yes, and it is very necessary in summer. The water, at that season, must be cold (*iced? Trans.*); but here, in autumn, I do not think it (*the milk? Trans.*) needs cooling.

*M. Berner.*—I quite approve of the plan of aeration, for it is certainly useful in the manufacture of butter and cheese; but I should not like the session to close without more discussion on the question, raised by M. Dallaire, relative to the fibrin and its action on the globules.

Does not the fact M. Dallaire mentions depend more upon the acidulation of the cream? If the cream has not been properly treated, there must remain more fat in the butter-milk. Do you say that by bad or incomplete skimming you can make a better quality of butter than by complete skimming, because, by incomplete skimming, the fibrin that injures the quality of the butter remains in the skim-milk ?

*M. Dallaire.*—That is indeed the opinion I have heard expressed by several makers, and, up to a certain point, I agree with them.

*M. Bernier.*—For my part, I think that the existence of the globules depends more on the acidulation of the cream than on the fibrin.

*M. Desrosiers.*—On this point I made the following experiment: I took some milk so perfectly skimmed that I found absolutely not a trace of fat in the skimmed milk. In milk less perfectly skimmed, I found that not more than  $\frac{2}{10}$  of fat was present. I have remarked this in several experiments. I do not give it as an article of faith, but in successive experiments that is the result I obtained. With perfectly skimmed milk, I have found no trace of fat in the whey (?), but I have never succeeded in leaving so little fat in my butter-milk as in my whey. I should like to hear the experience of men more skilled in this than myself. The question might be left to the professor at the St. Hyacinthe school.

*A Delegate.*—I should like to have M. Chicoine's opinion.

*M. Bernier.*—Do not let us speak all at once.

*M. Chicoine.*—I cannot answer the question; I have no Babcock in my factory.

*M. Dallaire.*—What is M. Taché's opinion ?

*M. Taché.*—My opinion is sought for:—I must say that I have made no special experiments on this point: however, I consider it as a positive fact that a maker cannot gain by skimming his milk partially what he would gain by skimming it harder, for the buyers will not pay him for any improvement possible in the quality of his butter an extra sum equal to what he would lose in quantity. I therefore think that the system of only taking the top of the cream is a bad one. All the experiments made on this subject show that we should skim as perfectly as possible; so I too think that, as regards profit, the thing is to skim as thoroughly as we can.

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*M. Bernier.*—But do you not think that the quality of the butter would be better if the skimming was not carried too far?

*M. Taché.*—There would be a difference, but so slight that hardly any one could distinguish it.

*M. Dallaire.*—That is my opinion too. (1)

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SIXTH SESSION.

Thursday, December 7th, 1.30 P. M.

DISCUSSION ON THE HORN-FLY.

*M. Brodeur.*—I wish to draw the attention of the meeting to the question whether the Horn-fly has done any injury to milk, and if so, how much. I have also found that another fact may have been a cause of injury. Early in September, a great thunder storm passed over the whole province, and I found that a great diminution in the yield of milk followed. This decrease occurred at once; the very morning after the storm, and I think that this must interest everybody, especially the patrons. If this is really a cause of loss, the patrons ought to see to it; and I found that where the cows were kept in the house, there was no loss. I repeat, the thing should be looked into, for it is important to know if there is any particular care to be bestowed on cows in such a case, especially in the autumn, when the weather is raw and there are frequently heavy falls of rain. I draw the attention of the meeting to the question, for it is shocking to see how little care is taken of their cows by some farmers. One thing, at any rate, is certain, cows must not be allowed to suffer in any way, if we want them to give plenty of good milk. In my opinion, the horn-fly diminishes the yield of milk in an enormous degree.

*M. Girard.*—It is very clear that if cows are ill-treated, not only the quantity but the quality of their milk will be diminished. Now, the horn-fly certainly inflicts pain on the cows; it is therefore reasonable to suppose that this pain must diminish both the quantity and quality of their milk.

*M. Allard.*—But, if the decrease is not the same every day, if it is of so much to-day and more or less to-morrow, or if the quality of the milk be diminished to-day and not to-morrow; if, I say, the quality decreases to-day, and the quantity to-morrow, can we arrive at the conclusion that these variations are traceable to the horn-fly?

*M. Brodeur.*—The upshot is, that the question must be investigated.

*M. Trudel.*—What opinion does Mr. Choquette hold on this question?

*M. l'Abbé Choquette.*—This is a question of experience, entirely. Still, I may say that, if for any cause, any ordinary cause, milk diminishes in quantity, we should

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(1) See, further on, the opinion of M. Fleury on the effect of the thickness of the cream.

not be surprised to find it richer in fat. This is the principle: if a cow gives 20 lbs. of milk to-day and only 15 lbs. to-morrow, I think the percentage of fat will be greater on the second day, that is that the quantity will be the same, or nearly so.

*M. Brodeur.*—Yes, but the horn-fly makes the cows really ill, and everyone knows that a sick cow not only gives less milk but their milk is poorer.

*M. l'Abbé Choquette.*—Of course, and therefore I said that this is a question of experience. We must learn if the horn-fly really does make cows ill.

*M. Parent.*—I have made tests of milk at different times in a factory, and I have found that the same patron brought milk one week that showed 4 per cent., and another week, milk of only 3.6. I can depend upon my accuracy in this, for my calculations were carefully made every week. When I found a decrease in the quality, I did not find a decrease of quantity; so that I agree with M. Brodeur in thinking that the question ought to be investigated. When the yield was less rich, I could find no reason explanatory of the fact; the cows must have been out of health. If the decrease in both quantity and quality had been proportionate, I might have attributed it to the effects of the horn-fly, but there was a difference in the proportions.

*M. Courchesne.*—In a place I visited, many farmers put their cows on silage. I found, after some time, a difference in the richness of the milk of cows when fed upon different sorts of silage.

*M. Brodeur* —Yes, yes; the question needs enquiry.

## LECTURE BY MR. J. L. G. FLEURY.

CIVIL ENGINEER, CENTRAL SCHOOL OF PARIS, PROFESSOR AT THE AGRICULTURAL SCHOOL OF LA TRAPPE, OKA.

### ON THE CARE AND MANAGEMENT OF STEAM-ENGINES AND BOILERS.

*Mr. President and Gentlemen:*

Your distinguished secretary, M. Castel, has done me the honour to ask me to give, at this meeting of your Association, some advice to your butter makers that may be useful to them in the economical management of their machines. I am happy in accepting this invitation, as far as my modest attainments permit, and I shall be content, if I have succeeded in thus doing some good to this industry, an industry especially Canadian.

I shall only give here some general advice, applicable to all kinds of steam-machines used in creameries; for, in such a lecture as this, I cannot enter into technical and scientific details, on which whole libraries have been written.

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For good *skimming*, one of the essential conditions is, that *the action of the engine be regular*; irregularity causes important waste of cream and firing. As all good makers should seek to diminish the cost by every means in their power, it is useful to indicate the points on which they are most generally negligent, and against which they most easily sin. This I will do briefly, insisting especially on *the losses occasioned by an intermittent action of the engine (marche défectueuse)*. The engine is often accused of irregularity of action, when in truth it is the engineer himself who is in fault.

To bring the boiler up to the pressure required, we begin by filling it with water up to the top of the highest tubes or of the highest parts to which the flame from the furnace can reach. If all these parts are not covered with water, they may become red-hot, and when additional water has to be pumped into the boiler, this water, coming into contact with the over-heated parts, will be converted into steam with such rapidity that an explosion may be the result. And another injury may result from this; if these parts are left too long without water over them, they may become burnt, lose their stability, and the boiler become useless.

Care must therefore be taken to *keep the level of the water high enough*. The average height is generally indicated by the middle of the height of the glass-tube that shows the water-level. This tube is placed sufficiently high, so that, when the water is at the bottom of the tube, the highest parts of the boiler are still covered with it.

As to the greater height of the water in the boiler, although this is of less importance, it must still be attended to. If the boiler be too full, the water will be carried away by the steam into the cylinder of the engine, which will slacken the speed, and perhaps cause the rupture of some of its parts. At any rate, this water carrying off with it all the caloric (*heat*) it contains, there will be a loss of heat and therefore a waste of fuel.

The best way is to keep the water as much as possible level with the middle of the water-gauge, or at least thereabouts.

When a boiler has enough water in it, one may "fire-up" without fear.

While the engine is at work, the firing up must never be done by fits and starts, that is, by filling the fire-box with fuel and adding no more till that is burnt or nearly so. What happens in such case? The fire becomes very strong, the steam rises, passes the maximum pressure of the boiler, the safety-valve lifts, the fire-box door must be opened, or an excess of water must be pumped into the boiler; the water passes over into the cylinder with the steam, and the engine which previously was working at the proper rate, slackens its speed. While efforts are being made to restore order, *irregular skimming is going on*, and besides *waste of fuel* and time, there is *waste of fat* which passes over into the skim-milk.

As regards the boiler, these hasty firings up, these sudden variations of temperature, disjoint the tubes, and may cause leaks costly to repair. A boiler thus treated



will not do one-third of the duty it otherwise would do, and the cost of the butter is increased in proportion.

*To manage a boiler properly*, the driver must know it well, and thoroughly understand his engine and its working, as a good coachman knows his horses, his carriage, and his road. The driver must constrain himself to keep up a *regular fire*, and to put on fuel at determinate intervals of time, every half-hour, every twenty minutes, or every fifteen minutes, according to the power of his boiler as regards that of his engine. At each firing-up, however, the quantity of fuel may be increased on demand, according to the prospect of a little more or a little less steam being required during the subsequent period of working.

The fuel, whether of wood or coal, must be spread uniformly over the whole surface of the grate, so as to allow the air to penetrate to every point of the fire-box. Combustion is regulated by the door of the ash-pan. If the flame is too powerful, the fire too lively, and the steam rises rapidly, the access of air is decreased by closing this door. If, on the contrary, the flame is not strong enough, it is opened. The combustion may be increased or decreased by opening the furnace door a little. Still, as to this last, it must be done carefully, and this door must never be wide open. Each different boiler wants, in the details of its management, special means of treatment, but a little exercise of good sense will soon find them out. Anyhow, an engineer who finds it necessary to pump water forcibly into his boiler, or to open wide his fire-box door to prevent the steam from rising, is a novice in his trade; he will lose time, expend a great deal of fuel, skim badly, and soon wear out his boiler.

*As to water*, I give the same advice about it as about the fire: never let it rise too high in the gauge or descend too low; but allow only trifling variations of height in proportion to the capacity of the boiler.

If the water is allowed to go too low, besides the danger of explosion, the water which must necessarily be suddenly pumped at once into the boiler, cools down its contents, the steam gets down, and the troubles already pointed out recur. Feed, then, the boiler as soon as the water has got lower than the limit fixed upon.

I must, however, remark that the effects I have noted are of less importance in *boilers of great force*, that is, which hold a great deal of water and are relatively powerful as compared with the engine. They, on the contrary, are very important in *boilers of smaller force*, that is, which have many tubes, hold but little water, and are relatively weak as regards the work required from them. And I must add that in creameries this is often the case.

The duty of every driver, then, is to study well his boiler, his machine, and its work.

The ash-pan should never be allowed to get full, for in that case the radiation of heat, especially if soft coal be used, wears out the bars of the grate, the access of air is impeded, the fuel gives out more smoke, and, of course, does not produce its full effect. The *tubes should be cleaned* as soon as they are slightly covered with soot. If, in the boilers usually employed at creameries, the tubes are not cleaned at least twice

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a week, they get full of soot and dust, which prevent the passage of the gases, check the draught, decrease, too, the transmission of the heat to the water; it is thus necessary to make a much stronger fire, which causes a more rapid wearing of the parts above the fire-box, brings about breakages, leaks, and, above all, an exaggerated expenditure of fuel.

*The cleaning out of the boiler* must be done more or less often according to the nature of the water used and the deposit it makes. Countries there are in which boilers have to be cleaned at least once a week; in others they will do if cleaned once a month. But these cleanings are absolutely indispensable.

There are here two cases to be considered: 1, the case of deposits adhering to the walls of the boilers; 2, of deposits in a pulverized form.

*First Case.*—The adhesion of deposits are those that stick to the sides so firmly that very often a cold-chisel is needed to remove them. If the tubes and the sides of the boiler become encrusted, it is much more difficult for the heat to penetrate from the fire-box to the water; and it becomes necessary, as in the case of the interior cleaning out of the tubes, to push on the fire, and incur thereby the expenditure of an excess of fuel. It often happens that these incrustations hinder almost completely at certain points the passage of the heat to these points, the sides get terribly hot, get eaten away, and the boiler is in danger of bursting.

*Second Case.*—Of pulverulent deposits. In this case the heating up, particularly in getting up steam, is difficult, and when at work these matters may be carried by the steam into the cylinder and wear that out rapidly. This often happens when impure, muddy water is used, which it never should be.

The very clearest water makes deposits. Against these are used matters that throw them down in powder and prevent them adhering to the sides. Of the ingredients of these matters I shall not speak here; they vary with the waters employed, and consequently with each county or district, and, besides, any one can get information on the subject in the district in which he resides.<sup>1</sup>

I will observe here that these deposits have great influence on the quantity of fuel expended, and I am sure that in the province of Quebec the losses they occasion amount to a considerable sum.

To clean out the boiler, many begin by *blowing off*, that is by opening the discharge tap (*robinet de vidange*) when the fire is out, and the pressure not more than 10 to 15 pounds. This may do with some waters, but with others it will not answer.

When the deposits remain in powder on the still hot sides of the boiler, when the water is discharged, the above plan is a good one, because the ebullition of the water causes the greater part of the deposits to go along with it, and little remains

<sup>1</sup> The material used to prevent encrustation varies with the geological formation of the district. All the great English makers of steam engines for farm purposes send to their customers materials suited to the district they inhabit.—A. R. J. F.

to be done. But some waters leave a deposit that, drying on the tubes when the water is blown out, becomes very adhesive and wants a great deal of work to get rid of it. In this case it is better to empty the boiler when it is cool.

In the former case the blowing-off must never be done when there is more than 15 lbs. of pressure, for the sudden cooling that this produces might, if the pressure were greater, cause disunion of the tubes, and therefore costly repairs.

To clean out the boiler, the man-holes in different parts of it must be opened, so that every part of it may be reached, if not with the hand, at least with the scrapers. The deposits are then got off as far as possible, and the places rinsed with cold water.

And now for the *driving of the engine*.

The tubes that lead the steam from the boiler to the engine should always slope either towards the boiler to allow the condensed steam to return thither, or towards the engine. In this case (the latter) a tap should be inserted near the lower point of the tube to allow of the condensed steam being got rid of without being obliged to pass through the cylinder.

To start the engine, first see that all the parts are well greased, particularly the head of the crank, and that the two drip-cocks (*robinets purgeurs*) under the cylinder and at each end of it are open. That done, open the valve for the admission of steam, gently at first so as to warm the cylinder and let the condensed steam escape. If necessary, give a turn to the fly-wheel. This starts it very gently at first. Then open the valve completely.

This valve should always be wide open when the engine is working; the regulator, not this valve, should govern the pace. When the engine is at the desired speed, and has been going three or four minutes, shut the drip-cocks. To start an engine by opening the valve wide at once without getting previously rid of the condensed steam, will risk the breaking or straining of certain parts of the engine.

*Greasing* the inside of the cylinder is done during the working of the engine by means of a special tap. Tallow is usually employed for this. The greasing is a matter of some importance; if it is neglected the wearing out of the cylinder and of the ground valve seat (*glace du tiroir*) is hastened, the engine takes more steam to run it at the proper speed, and therefore expends more fuel.

You must oil daily, and even several times a day, those parts where there are no special oil taps, as is usually the case with the slides and hangers of the machines used in creameries. No worse plan than to pour on a lot of oil and then say: there, that will last for two or three days. No, the engine is no better oiled thus than if only a few drops were given. The *oiling must be done repeatedly*, but very *moderately* each time. To pour out a flood of oil on the different parts that require it, to save the trouble of the driver, is wasting the oil and clogging the engine. Some of the bearings are supplied with oil-cups; see that they have always cotton in them, so that the oil can run drop by drop. Without the cottons, the oil-cup is useless. The cotton should neither be too tight nor too slack. They should only allow the oil to flow as fast as the parts lubricated require it, neither faster nor slower.

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*When any part heats* in spite of the proper oiling, stop the engine at once, and do not go on pouring out oil to no purpose. *Heating* involves *unnecessary wearing*. The cause of the heating must be found out, bolts too tight for the hangers and slides, and the keys of the crank too screwed up; these must be slackened carefully. Heating may also be caused by a strained part; in this case an expert must be sent for at once, as you run the risk of greatly injuring the engine in a short time.

These, gentlemen, are some principles, very elementary, but absolutely necessary. These principles will enable those acquainted with them to economize material, fuel and time, and to make good work: all things worthy of consideration.

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#### REPORT OF THE COMMITTEE APPOINTED TO STUDY THE QUESTION OF WEIGHING CHEESE.

We, the undersigned, appointed by the convention of the Dairymen's Association of the Province of Quebec, members of the committee to study the question of the weighing of cheese at Montreal for export, have the honour to submit to you the following observations:—

1. That cheese, being sold by wholesale, ought to be weighed as such, for the verification of the weight marked on the boxes, *i.e.*, that for a lot of cheese less than 100 boxes, five boxes ought to be weighed together at once; and when over 100 boxes, there ought to be weighed in the same way, five boxes per cent.; this weighing being made with the beam of the scales raised.

2. That, if the weight of the cheese delivered at Montreal is to continue to be verified by the weighing of a few isolated cheeses, the weight verified be fixed by the beam of the scales being level, all the fractions going to the good of the buyer.

And we advise that buyers adopt one or the other of the systems, and notify the secretary of the Dairymen's Association of the Province of Quebec of their decision before the 1st of April, 1894.

*As an amendment to the conclusions of the preceding report,*

M. J. A. L. Taché, seconded by Mr. S. A. Fisher, proposed: 1. That the association of butter and cheese buyers of Montreal be requested to publish the practical rules showing how the weighing of butter and cheese is to be done, in order to avoid the differences arising from the mode of proceeding adopted by the various public weighers; these rules ought to declare, among other things, that the beam of the scales being level, shall give the weight marked on the boxes;

2. That, the weighing at Montreal being done to test the weighing at the factories, it is a matter of importance that a sufficient number of boxes of cheese or tubs of butter should be re-weighed, and that in the opinion of this meeting this proportion should be fixed at 10 per cent for boxes of cheese, and 20 per cent for tubs of butter.

3. That notice be given to the association of the names of the public weighers who are sanctioned by the chambers of commerce of Montreal;

4. That the association be requested to pass a resolution strongly insisting on the importance of the creameries and cheeseries of the province belonging to the syndicate of their respective districts;

5. That a delegation of the meeting be chosen to go to Montreal to meet the association of dealers in butter and cheese, and to come to an understanding with them on the different points mentioned in these presents.

*Mr. Fisher.*—To close this question of weighing, it is my opinion that a committee should be formed to visit Montreal and confer about it with the Board of Trade. I think that if a numerous deputation were named, we should have more influence on that board than if only two or three went.

I will also propose that this question be treated: Are the buyers in favour of the syndicates or the reverse? It is well known that, in the rural parts, they have often worked against them. It might, therefore, perhaps, be useful to put this question, so as to find out whether or not they are prepared to change their mode of behaviour as regards the syndicates. I think it would be advantageous to treat that question before the Montreal Board of Trade, if the association be there represented by persons on whom we can reckon to defend our interests.

*Mr. Barnard.*—I think Mr. Fisher's proposal is a good one. I propose that M. Taché be one of the delegation sent to the board of dealers in butter and cheese at Montreal.

*M. Clément.*—I think that the deputation sent to Montreal to confer with the Board of Trade should try to get a declaration, written and signed by the buyers, to the effect that they are and shall be in future in favour of the syndicates. We have already had many difficulties, and even law-suits; with this declaration we should have something to go by, if such difficulties arise. We might publish it in the *Journals of Agriculture*, so as to bring it to the knowledge of all the makers and patrons.

*Mr. Fisher.*—M. Taché and I have been proposed as delegates to Montreal. I ask for another, and I propose that M. Brodeur be added to the delegation.

*M. Brodeur.*—I do not altogether share in the opinion of the meeting on the subject of weighing. As I said before, while the question was under discussion, I have never had to complain of the buyers, and I do not think I should be a good protector of the cheese-makers and the patrons. My opinion is that the sellers work for their own interests as much as possible, and that the buyers simply do the same. As I have always held this opinion, if I am hardly inclined to make part of this delegation, it is not that I wish to defend the buyers; I do not say that no one has reason to complain of them; I only speak of myself. I have had cheese made at my place for fifteen years; I weigh it myself; I have sold it to several Montreal firms, and I have never had to complain—oh, yes, once, because I could not get paid: but that is

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another story. As to the weight, I have always had the same at Montreal that I found at home; I have sometimes even had a pound over. How, then, can you expect me to go and make war on the Montreal buyers?

*M. Clément.*—Would you tell us, please, how you weigh your cheese?

*M. Brodeur.*—I put the beam at nearly a third, but to get my measure it must be over one-half and it even touches sometimes.

*Mr. Barnard.*—We must have another delegate, and I, too, propose M. Brodeur.

*Mr. Fisher.*—I do not see that the reasons M. Brodeur has assigned should prevent him from accepting this mission. It cannot be intended that the delegation should force its views on the dealers; it is only to go and discuss the matter with them, to give them all the information likely to enlighten them as to the opinion of the makers, and M. Brodeur, who is perfectly versed in the discussion we have had on this point, although he has never had any dispute with the dealers, is a man in a position to represent with credit the association at the proposed interview.

*M. Brodeur.*—If you put it in that way, *i.e.*, that I should be useful to the association, I refuse no longer. But I prefer telling you my opinion, to explain my view before leaving. If at first I did not care to go, it was because I was not personally interested in going, and it did not seem to be any business of mine. But as soon as you press it, I am ready to surrender.

*Mr. Fisher.*—While we are still upon this question, I will tell of an occurrence in my county. A maker was not satisfied with the weight of some cheese he had sent to Montreal. He told me that the dealer had cheated him; that he had made him suffer unjustly in the weight of his cheese. He meant to go to Montreal to see about it, and he did go, and on his return, two days afterward, he was satisfied. He had seen the cheese weighed himself, he had had explanations with the dealer, about the scales, and he was perfectly satisfied with them. He has never since complained of having been *cut* in the weight. As for me, I can say nothing personally, for I have never had any disputes with the dealers, but, as you know, there are many makers who complain, so it is important to know how we stand, and I am glad to see MM. Taché and Brodeur accept the mission you entrust to them of going to Montreal: I am certain they will bring the affair to a good end.

*M. Parent.*—I should like to have the opinion of the dealers about the syndicates. I, indeed, think they are in their favour; but many say they oppose them. If they are not in favour of the syndicates, it would be well to lay the question before them; and I cannot believe that, after the information that the delegates can give them, they can refuse to acknowledge that these bodies have done a great deal of good, and that it would be unfair as well as stupid to work against them.

*Mr. Fisher.*—By all means; this is another question that should indeed be submitted to the dealers in dairy-goods.



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## SECOND LECTURE BY M. GAB. FLEURY.

### EXPORT BUTTER.

*Mr. President and Gentlemen :*

Until this morning, I was a stranger to most of you, but I love farming and the industries connected with it, and not only have I employed my leisure in the studies which belong to them, but I have practised as a butter-maker for many years in France and in Manitoba: with such qualifications you will allow me to address you as a colleague and a friend.

The subject I am about to treat will lead me to speak of certain delicate points in the making of butter, and to treat upon some ideas that are largely entertained; but I am utterly unbiassed; I am among you to present to the meeting, in a simple form, as an examination, some facts with which I am acquainted, thanks as much to my studies as to my experience as a maker, and which may prove of interest to the butter-making business. Has not this meeting for its aim the listening to all those who can aid in this industry, the industry par excellence of Canada?

I am going to treat of the manufacture of butter especially intended for exportation.

Belonging, as I did, to a company, set up for the purpose of creating for the butter-trade of that country outlets in China and Japan, which markets were then almost entirely supplied by butter from France, I was led to study in a particular manner this style of making.

The Province of Quebec, for its part, seeks for outlets in England, and your secretary thought that, perhaps, a report of my researches and of the practical results obtained in this direction might prove interesting to some of the producers of butter in this province.

Before broaching the subject, before entering upon the marrow of the question, permit me again to recall certain principles, well known, I am aware, to many of you, but principles that will assist me in justifying myself for pursuing the methods of manufacture I am about to describe.

#### 1. THE COMPOSITION OF BUTTER.

The fatty matter of butter, like all other natural fatty bodies, is a *mixture* (and not a *combination*) of certain substances called *glycerides* or *ethers of glycerine*. These glycerides have the characteristic property of saponifying with bases, *i. e.*, if they are treated with an alkaline base, such as potash, lime or soda, they will subdivide, while absorbing water, into glycerine on one part, and on the other, into a fatty acid which will unite itself with the lime, soda, or potash employed.

Nowadays, it is admitted that the fatty matter of butter is a mixture of ten glycerides, five of which are liquid at ordinary temperatures and five solid.

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Among the former, four give by saponification *volatile fatty acids*; these are *butyric, caproic, caprylic and capric*; the fifth gives a *liquid acid, oleic*.

The five latter all give *acids solid* at common temperatures; there are, first, *palmitic and stearic*, a mixture of which exists also in other fatty bodies under the name of *margarin*; then come *lauric, myristic and butyric*.

A good butter then is a mixture of all these glycerides, of which it contains an average of 80 per cent. In it there are besides, 6 per cent. of salt, 0.50 per cent. of sugar of milk, 1 per cent. of casein and other impurities, and lastly, 12.50 per cent. of water.

Of the liquid glycerides, the oleic exists in the fat in the largest quantity, butyric and caproic in small proportions, and caprylic and capric are in trifling quantities.

Palmitic and stearic are the most important of the solid glycerides, the others may be disregarded.

According to Voelcker, the fat of butter contains:

63 to 68 per cent. solid glycerides:  
29.50 to 30 per cent. solid oleic:  
8.50 to 2 per cent. volatile acid glycerides:

Recent researches allow:

91 to 92 per cent. of palmitic, stearic, oleic.  
9 to 8 per cent. of other neutral fats.

In summer, when cattle are at grass, there are more liquid glycerides than in winter. We know, indeed, that temperatures being equal, butter is usually harder in winter than in summer. The food of the cows makes this difference in the proportion of the different glycerides.

In the fat of butter, we moreover see in the free state, or in combination with ammonia, beside the glycerides and other components derived from them, acids proceeding, as we shall see, from the saponification of part of this fat by the oxygen of the air and microbes; it is these acids, especially the butyric and caproic acid, that impart to the butter more or less flavour, for in a pure state these fats have no taste at all.

In good butter, the ratio of the butyric to the caproic acid is 1:2; and a remarkable fact is, that in any particular district this ratio is constant, a fact that enables one to detect positively frauds in butter. The sum of these two acids in butter varies from 4 per cent to 8 per cent of the weight of the fat: at 8 per cent, the butter is uneatable.

## II. THE TAINING OF BUTTER.

The agents in the deterioration of butter are: 1. oxygen, the action of which increases in heat and still more in light; 2. the microbes and cryptogamic growths.

Fresh butter, kept *in vacuo*, or in an inert gas, protected from the action of these

two agents, becomes tainted by the mutual action of the different matters they are compounded of; but this deterioration is so slow and inefficient, that practically it may be said that, under these conditions, butter is a stable product, and when deterioration does take place it is attributable to oxygen or to microbes.

*The action of oxygen.*—If, discarding for the time, the action of the microbes and of cryptogamic growths, we study the action of oxygen, we find that this gas, especially in the light, acts upon the butter-fat by saponification, setting thus at liberty the fatty acids and the glycerine. The action influences particularly the glycerides and volatile acids, and principally the butyric and caproic, setting at liberty butyric acid and caproic acid.

It is the presence of these acids in butter in excess that causes the *rancid* taste. The action of oxygen also affects, but less forcibly, first the olein, setting free the oleic acid, and next the five other solid glycerides, chiefly the palmitin and stearin, freeing the palmitic and stearic acids.

The oleic and solid acids are, besides, oxidised in part, and the glycerine, derived from the saponifications, is transformed in part, into formic acid; it is these acids, oxidised or not, and this formic acid which make butter *taste like tallow*. So much for the action of the oxygen of the air.

If we turn now to the study of microbes and cryptogamic growths, we observe:

1. *The action of the ferments of the fatty matters*; 2. *The action of the ferments of the casein*, which butter always contains; 3. *That of the ferments of the sugar of milk*.

1. *Ferments of the fatty matters.*—These ferments act on fatty bodies in the same way that oxygen does. Like it, they prefer to attack the least stable glycerides, *i. e.*, the volatile acid glycerides, and free the butyric, caproic, capric, and caprylic acids, which, in part, remain in the butter, in part, evaporate, and the remainder is consumed by its own ferments. Their attack on the other glycerides is almost negligible: it produces nearly the same effects as does oxygen.

2. *Ferments of the casein.*—These ferments act on the subject to form first ammonia, part of which unites with the above mentioned acids, and of which another part may assist, as a base, in the saponification of the other glycerides. Too much casein in butter is at any time a bad sign of its keeping qualities; but the fermentation of the casein gives rise in addition to peptones and salts of ammonia, which give a certain flavour to the butter.

3. *Ferments of the sugar of milk.*—These ferments attack the lactose that butter always contains, and transform it into lactic acid, which may unite in part with the bases that the butter may hold and undergo a second fermentation, transforming it into butyric acid. Wherefore, we must strive to diminish the quantity of lactose in the butter, by *thoroughly washing it*.

To abridge what I have been saying: the *deterioration of butter* comes from the continued actions of *microbes* and *oxygen*, which aid each other and gain force by acting together, and have all the effect of:

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1. Freeing the odoriferous fatty acids, the chief of which is the butyric, which gives the butter a *rancid flavour*.

2. To free the glycerine and partly transform it into formic acid.

3. To free the fixed acids, chiefly the oleic, stearic, and palmitic, and to partly oxidise them.

It is these two latter effects that principally cause the tallow-taste of butter.

I may add that all butters are not equally sensible of these destructive effects. Their composition, in glycerides of fixed and volatile acids, in lactose and casein, varies; and, consequently, their deterioration becomes stronger or weaker, as the case may be. Such are, in the rough, the *phenomena* that produce the *tainting of butter*. I cannot, here, enter into more details.

Let us now see the *practical means and precautions* suggested by these facts, and which must be taken to retard and diminish the *tainting* of butter and allow of its being exported in the best condition.

#### RIPENING THE CREAM.

In the cream-ripening-vat, we observe the action of the oxygen and of the different ferments already mentioned.

*The thickness of the cream* is an important point, and we must now examine how the *thinness* and the *thickness* of the cream affect the process of butter-making.

1. *Thin Cream*.—If our cream is very thin, containing a good deal of milk, and therefore of lactose, the ferment of the sugar of milk will play the chief part in the ripening. Now, this ferment requires oxygen for its development, and disengages carbonic acid. It will then absorb the oxygen dissolved in the cream, will disengage carbonic acid, and the action of the oxygen on this fatty matter of the butter will be destroyed. But the lactic acid produced will throw down the casein and the other products deserted by the ferments will partly gelatinise it; it will incorporate itself more easily with the *butter, which will be harder to wash*, and consequently will injure its keeping qualities. The ferments of the casein themselves will act more powerfully and will impart more flavour to the butter, flavour derived from the peptones and the ammoniacal salts. In this case, on the contrary, the action of the ferments of the fat, like that of the oxygen, will be weakened; there will be less fatty acid and formic acid; *the flavor of the butter made from this cream will be diminished*.

2. *Thick Cream*.—Thick cream will contain less milk and casein, so the action of the latter ferment will be weaker. Little oxygen will be absorbed and but little carbonic acid disengaged, and this thick cream combining in its solution more oxygen, this gas will attack the fatty matter with greater ease. The ferments of this substance in this case, too, find their development more easy; the flavour derived from the butyric, caproic and formic acids will therefore predominate; but, contrariwise, the action of the ferments of the casein will be abated, as well as those of the lactose. The flavor from the peptones and salts of ammonia will be less, but there will

also be less gelatinised casein, the *butter will be easier to wash*, and will enclose less of it (*i.e., of the casein*).

From my experiments, I am led to believe that, to make good keeping butter, *cream of average consistence* should be used; this rather favours a slight action of the ferment of the lactose, but diminishes the action of the ferments of the fat and casein.

I have not yet been able to ascertain exactly the *best temperature* for churning, but I know that by putting the cream into the ripening-vat at 52°, and managing so that it may rise in heat of its own accord, and 12 hours after be at 58° to 60°, no ferment being added, good keeping butter may be made. When *new* it has *but little aroma*; but when once *in the tubs*, it *ripens* sufficiently, and *gains its proper flavour*. The yield is better than when churned at a lower temperature.

#### CHURNING.

When the butter is in *tiny globules*, the surface exposed to external influences is *very great*. I have made the calculation: Supposing the globules to be 1-32 of an inch in diameter, the surface will be, in a churning of 300 lbs., about a quarter of an acre! If you notice that rain or river water always holds in suspension and solution a crowd of principles, chiefly alkaline, which can aid the saponification of the fat, you will perceive that for export butter this surface must be diminished as much as possible during the working up of it. This result can only be obtained by so churning as to bring the butter in large lumps. So, if we suppose the butter to be in pound lumps about, the surface exposed to external agents will not be more than some 800 square feet.

#### WASHING, SALTING, WORKING.

For these three operations I employ a machine widely used in France, especially in the factories of export butter, where I saw it at work for the first time. It is the *American butter-worker with revolving table*, with which you are doubtless acquainted, but modified in this way: between and above the two cylinders a small trough is placed, which is pierced with a series of holes in its under part. Perfectly pure water, iced in summer, is run into this. The butter in passing through the cylinders is thus sprinkled. I have always used this implement since I have known of it, and I can assure you that in a few revolutions of this table the butter is thoroughly washed, better even than in the usual way, and that without exposing a great surface of it to the action of the air and of the injurious principles of the water used.

A few turns suffice for this washing; the tap is then shut, and the butter is worked until not more than 20 per cent. of water remains in it; this takes four or five turns of the worker. It is then salted, with salt neither too coarse nor too fine, at a rate of about 6 per cent. For this three or four turns are enough; it is then put into tubs, carefully packed level, and put into the refrigerator for 12 hours, when

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it is worked for the last time, so as to make it uniformly consistent; not more than 12 per cent. of water should be left in it. The butter is then packed in tubs with as little empty space left as possible.

In the export butter factories in France the butter, in lumps, is bought of the farmers, taken to the factories, and there tested and classified in several categories. It is then placed in a large beech refrigerator and kept at a constant temperature of 49°. It is worked with the implement I have mentioned, and with it are incorporated 6 per cent. of salt and a mixture of boracic acid and borate of sodas in proportions which I have not been able to learn accurately. Thus, generally speaking, the French export butter is made by the farmers themselves, but purified and made homogeneous by the butter-worker. Doubtless, the same thing could be done as well here.

The butter obtained by this method I have just described to you is a butter that, when fresh, has but a weakly flavor, but keeps perfectly. In time the flavor increases, for butter ripens like cheese does. I intended to study this question, but circumstances independent of my own wishes obliged me to desist from my investigation. I hold that the question of the ripening of butter might be easily solved, so that, a butter in very fresh condition being given, it would be possible to bring it to a flavour certain to please customers within a certain space of time.

I will add that export butter factories must be kept in a most perfect state of cleanliness. It may be said that every creamery, like every cheesery, has a *tempérament microbialogique* which varies with its state of cleanliness or dirt. If the products are good, pains must be taken to keep up the temperament unmodified, and this is done by doing the work and the washings-up every day exactly in the same way, even in the most trifling details.

Such, Mr. President and Gentlemen, is the method of butter-making that I had to develop before you to-day, and which I have practised for several years successfully, for my butter used to sell in British Columbia for two cents a pound over market price. Some of it has even been sent in 50 lb. and 60 lb. tubs as far as Mexico, where it arrived in good order, and was sold at the highest price.

I shall be glad if my essay shall prove useful to any of you, if it shall induce some persons to follow up the researches on the *ripening of butter*. I beg to say that for that purpose I hold myself entirely at their disposal, and shall be happy to give them the most ample, detailed information which, in such a slight sketch as I have presented you, it was impossible to furnish.

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<sup>1</sup> M. J. O. Leclair, director of the Dairy School, not being present at M. Fleury's lecture, we submitted this essay to his inspection; an exchange of views ensued between these two gentlemen, which will be found in the supplement of the report.—E. C.



## LECTURE BY M. W. GRIGNON, M.D.

*The relations that should exist between the Dairymen's Association and the Farmers' Clubs.*

## HOW TO SECURE THIS.

*Mr. President and Gentlemen :*

Once more I have entrusted to the care of Providence my beloved patients, and have come hither to enjoy your work and to unite my efforts with yours. A good woman, one of my patients, scolding me one day for my frequent absences for the sake of agriculture, said : " In my opinion, doctor, it will not be long before you give up pill-making and become a butter-maker." I only replied : " Just exactly what I am aiming at, ma'am ; for, as soon as my sales of milk, cream and butter shall be sufficient to assure daily bread to myself and my family, I shall proclaim my independence ; I shall cease to be at everybody's beck and call, day and night, and I will make you a present of all the drugs in my shop. As for you, ma'am, make haste and get cured, for shortly, milk being so health-giving a food, and so abundantly produced in this province, there will probably be no more illness, and therefore no more doctors." For why, moreover, should a farmer bleed his purse, as heretofore, to make of his sons doctors, advocates or notaries, when it is clear to day that they can find easier means of living by dairying than in the liberal professions ?

How many youths of talent, after having gone through their classical course at that grand institution, the pride of the province, the College of St. Hyacinthe, had they an opportunity of studying for some months in the modern dairy school of the same town, there learning to make butter and cheese instead of becoming office clerks, would be on the high-road to fortune instead of vegetating miserably ?

Let the greatest care and respect be shown in the preservation of the present colleges, which have furnished distinguished men to the state and the church ; such is the desire of every good French-Canadian patriot, but to try to increase the number of these colleges would, in my opinion, show a want of good sense. It would be wiser now, I think, to set about laying the foundations of manufacturing and agricultural practices, establishments like the Dairy School that we all admire here at St. Hyacinthe.

I pray you to excuse me, Mr. President, if I have taken the liberty of entering into these few general considerations that I leave at once to enter upon my special subject.

The more I think of the great work done in this province by the Dairymen's Association and the Farmer's Clubs, the more am I convinced of the magnitude of the part these two institutions are called upon to play.

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The object of the Dairymen's Association is to bestow ease and wealth on the abode of the farmer by instructing him how to throw good products on the market; by establishing connections between the makers and the consumers of dairy goods; by finding handy markets for our products; in a word, by favouring to the utmost the development of the dairy business.

The Farmers' Club, too, works towards the same end, to bring ease and wealth to the abode of the farmer, by showing him by means of lectures or discussions the necessity he is under of changing his system of farming, of abandoning the habit of sowing grain after grain; of keeping good milch cows and feeding them in winter as in summer by means of green-fodder crops; of contending against extravagance and inebriety, etc., etc.

Since these two institutions aim at the same end, why should they not follow the road thither together? The success of the one would contribute to the success of the other. The Farmers' Club should be the gate through which should pass the Dairymen's Association in its attempts to reach the ear of the people.

Let the dairy industry and its advantages be discussed before the clubs, in districts where dairying is stagnating, and very shortly the establishment of creameries and cheeseries will be seen. Thanks to the clubs, the association can work with greater freedom, and the clubs in their turn, being in direct relation with the association, will become more intimately familiar with the great and good work it has done in the province. How many clubs, how many parishes, when they hear of the wonders accomplished, here at St. Hyacinthe and other parts, for instance, by the Association, will seek to imitate these places and will succeed in doing so.

Since it is useful and even pressing to establish between the clubs and the Association such bonds of union as shall conduce to the advantage of the farmer, let us take the means required for that purpose. How many clubs have replied to our appeal? Of 400 clubs now existing in the Province of Quebec, how many are represented here to-day? Hardly 100, I dare to say. So there are 300 clubs that have not the benefit of appreciating the fruit of the labours of our members, who are ignorant of all the good done by the Association, of all the thousands of dollars brought into our country by it, etc. Can we reckon on the good will of all these farmers toward becoming members of this grand society? It is hard enough sometimes to get them to subscribe a dollar towards a club that is at work in their own parish. How, then, can you expect them to enter into a society the object and the field of operation of which they know nothing about? Nevertheless, it is important that all farmers should be well informed about your transactions. I submit this suggestion in all humility: Admit to this, the Dairymen's Association, as members, all the presidents of the Farmers' Clubs of the province, and let the Government retain from each club the trifling sum of one dollar, a most insignificant contribution of a whole parish, but one that would increase your revenue by \$400 and put the whole province in possession of an account of your great work, since you would be in honour bound to send to each president an annual report of your proceedings,

which would be read before every one of the clubs. If you are in favour of this suggestion, I will take upon myself, at the next meeting of the Council of Agriculture, to present a motion for the modification of the law in this sense.

As a delegate from the clubs in the north of the county of Terrebonne, permit me, Mr. President, to report to you the operations of my farmers' clubs, not so much to show you what has been done regarding dairying as to have the honour of receiving your criticisms and such suggestions as you and your colleagues shall see fit to give us.

Our agricultural society was established in December, 1888; it is composed of eight clubs, comprised in the parishes of Ste. Adèle, St. Sauveur, Ste. Agathe, St. Faustin, St. Jovite, Ste. Marguerite and St. Hippolyte. There were 210 members in 1889, and now we number more than 500. The society holds exhibitions only once in five or six years. In the years intervening between the years of holding exhibitions the funds of the society are devoted to the purchase of pure-bred breeding stock and farm implements. Thus, during the last four years, the society has expended \$2,506 in the following purchases:

50 Rams.....	\$514 41
26 Boars.....	485 73
Implements.....	200 00
Subscriptions to the Journal d'Agriculture.....	158 00
Clover Seed.....	545 00
Prizes for competition of best cultivated farms..	113 63
24 Jersey bulls.....	489 25
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Thanks to the establishment of the club, clover seed is cheaper, and the importance of sowing it thickly is better understood. So, this last spring, 9,500 lbs. were sown, against 2,150 lbs. in 1888. With the samples of grain sent from the Ottawa Experiment Farm in 1891 we have much improved the quality of our grain. Thus, with 300 sample bags of *Prize-cluster* oats, we have harvested nearly 80,000 bushels, 40,000 of which can be sent to market. This kind of oats weighs 41, 42, and sometimes 43 pounds a bushel and ripens earlier than our own old kind. And so of the *Red Dakota potatoes*, which yield largely and are absolutely free from rot. In the parish of Ste. Anne alone, *three* potatoes only were given to each of the 150 members of the club. To day that parish could sell 20,000 bushels of this potato, besides keeping enough for seed and home consumption. We may well say now, I think, that great things may spring from small beginnings.

I can state positively that in less than four years a whole county, thanks to the Experiment Farm at Ottawa, can entirely renew its seed-grain and vegetable-seed.

It is the duty, moreover, of the clubs to demonstrate in their wise discussions the waste of money expended in the purchase of showy carriages; to make fun of

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Do you imagine, young man, that the curé of your parish, the professional man, the manufacturer, the banker, the wealthy farmer, do you believe that all these will fall into ecstasies at seeing you arrive in the village, at full speed, got up all in black cloth, your cap on the side of your head, with your arm round your sweetheart, and lazily stretched at length in your phaeton? Ah, no! very far from it! They will form but a poor opinion of you, and they will be right.

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

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### THROUGH THE SYNDICATES.

*Summary.*—Reasons for visiting the syndicates.—Coöperation of MM. Côté and Livingston.

*First portion of observations.*—The law of syndicates.—Maximum number of factories in each syndicate.—Inspectors-general.

*Second portion of observations.*—Local inspectors. Defect of qualification. Negligence in testing milk. Absence of cleanliness. Want of initiative and energy. Excess of self-confidence. Difference of opinion among the authorities. Inspector-buyers.

*Third portion of observations.*—Proprietors and makers. Defective buildings. Multiplication of small factories. Injuries caused by them. Conceited makers. Careless makers.

*Fourth portion of observations.*—Special subjects. Division of the costs of syndicates. A word on coloring cheese. Systems of selling cheese. Prudence to be observed in reforming the defects mentioned. Yearly meeting of the inspectors at the school. Winter meeting of the inspectors and makers in each district. Their appreciation by Lord Derby. The syndicate praised by Professor Lezé. Appreciation of their organization by Mr. Derbyshire. Action of all necessary to their perfect working.

*Mr. President and Gentlemen,*

Called upon, as I have been, to give a lecture before the present convention, I thought I could not do better than to lay before you the observations I made last summer, during a tour I then made through the syndicates of the province of Quebec.

Our dairy department at Ottawa decided that this tour should be made, for three reasons:

1. Because these associations of factories are of such value, owing to the results expected from them and that they are beginning to give, that they deserve to have their good management attended to ;

2. That it is only by holding a careful local inspection of every syndicate that their imperfections can be detected, which defects may have slipped into the law that governs them, or into its application, and that the more or less perfect competence of the local inspectors can be ascertained.

3. This was for the time by far the most important ; since the visits had for their object to search out, in the syndicates, the factories that could furnish cheese fit to figure in the last competition of dairy-products at the Chicago-Fair.

To render these visits more efficient, the executive committee of the Association, at my request, sent with me one of the Inspectors-general of syndicates, M. Saul Côté, in order that we might more thoroughly study out the reforms to be suggested.

M. Côté is one of the officers best qualified for the position he occupies. He started as an apprentice to dairy-business thirteen years ago, and since that time, by assiduous attention, he improved himself and became fit to hold the confidential posts the Association has assigned to him, first as inspector, previous to the establishment of syndicates, then as instructor in the travelling school of the Association, and lastly as Inspector-general. He has especially developed that spirit of observation so necessary to a good inspector, and he has the firmness required to point out the defects he discovers and to insist upon their reformation, and that without wounding the feelings of any one.

In order to make a more penetrative examination, one in accordance with the importance of the object in view, when selecting the factories chosen to send cheese to Chicago, Mr. Henry A. Livingston, instructor in cheese-making at the dairy-school, was also sent with me.

The Association has, in Mr. Livingston, a skilled instructor, one who cannot but be of great service to it, for he loves his business. Conscientious—almost too conscientious, I am tempted to say, if a man could be possessed of too much of such a fine quality—his work is so much the more efficient from his knowledge of both languages ; it is almost necessary for the English in our province to know French.

Before relating my observations to you, I must put you on your guard against an impression which may perhaps affect you in hearing me only quote the defective, blamable things I found in the syndicates. Such might have the effect of making you think that the system of syndicates was useless. Others will tell you all the good they have done ; my part, a rather unpleasant, but still a necessary part, is to acquaint you with their faults, in order to put you in the way of remedying them.

The observations made in the course of our tour may be classed under four categories.

The first category belongs to the law itself that governs the syndicates.

An article in this law says that a syndicate shall comprise not less than 15 and

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not more than 30 factories. Thirty, the maximum, is certainly too high; even 25 would be too many. Indeed, the idea of the organisers was to have each syndicate visited at least once a month by the inspector. Now, deducting Sundays, there only remain 25 or 26 working days a month for the inspector, and as he has always on his list some factories where he ought to pass a couple of days, it is easy to see that he cannot efficiently visit more than 20 factories a month. I think, then, that it would be wise to fix the maximum at 20, if it is desired that the inspector should act without hurry, and do justice to every one.

Another article of the law says that there shall be one Inspector-general. The committee has been obliged to modify this article, this year, by appointing two, and for this reason: the number of the syndicates is so great that a single Inspector-general cannot sufficiently overlook all the inspectors, on account of the great distances to be travelled and the mass of information to be given. The Inspector-general is often, in difficult cases, obliged to pass several days in the same syndicate. Then, there are syndicates almost wholly English, and it is difficult, even impossible, now, to find one inspector, even if could do the work alone, that could do it in both languages. In future, then, the principle of two Inspectors-general must be admitted into the law, for the number of syndicates is still on the increase.

*The second category of observations bears on the local syndicate-inspectors.*

The great and sudden increase in number of the syndicates, which has doubled this year, took the Association by surprise, and it was obliged, in order to furnish inspectors for all, to give provisional diplomas, without being too nice about it. The result was that the service of some inspectors was not so efficient as might have been desirable. Without blaming any individual, I will point out all the chief faults we noticed.

Some inspectors, we thought, did not seem to feel sufficiently the importance of testing, in every factory, the milk at each visit. And yet, this test is, so to speak, the point that ensures good making and good products.

Others neglected the duty of cleanliness. We, in company with the local inspector, visited some factories, and when we told the maker, privately, that his factory was not kept clean enough, his reply was that we were more particular than the local inspector.

In one case, we met with a factory that usually made good cheese, but this year, up to the time of our visit had only made badly flavoured cheese. They had looked into it, modified the way of making, consulted the local inspector, all to no purpose. When we got there, we were notified of this trouble. After having hunted unsuccessfully for the cause of this for ten minutes or so, I saw the moment dawning when M. Côté would tug at his hair from rage at not being able to discover anything, when, all at once, proving that he knew how to make use of the gift he had received from Providence in the shape of acute powers of smell, and I, making use of my spectacles, we discovered that all the milk brought to the factory had for many a day been run through a stinking trough before it reached the vat. For, indeed, the



cylindrical part of the trough into which from the weighing-can is poured the milk to run it into the vat, was covered inside with a yellowish, stinking lining more than a line in thickness. The milk imbibed the germs of infection, which afterwards slowly developing themselves, caused the cheese in a fortnight's time to have a bad flavour.

We have met with inspectors who had all the good qualities required for the discharge of their duties, but who failed in initiation and energy: in initiative, to take the steps needed to punish the guilty among the patrons when they were found out; in energy, to support their accusations when once they had been brought. The decrease of fraud cannot be obtained by means of the inspections, except in proportion as the necessary measures are taken to reach those who have broken the law.

The evil, in most of these cases, arises from the fact that people generally try to secure for each district an inspector belonging to it. The inspector then finds himself hindered by several reasons: familiarity with the makers, friendship with the proprietors, connection with the families of some of the patrons. From this it follows, that it were better that the inspectors were, as far as possible, selected from districts remote from those in which they have to work.

Would you believe it? there are some inspectors that are too learned. At a former meeting, I happened once to speak of certain farmers who, though endowed with only a very ordinary knowledge of farming, think they know as much about it as any one, and who, by their bragging talk, made others who did not know them think that they are more skilled in farming than many people; and I compared those illustrious *savans* to the stems of wheat whose ears contain no grain, and carry their heads on high in the field, precisely because they are empty. Well! We have met with inspectors having pretty nearly the same defect. They listen to the advice we think it necessary to give them with a certain air of condescension. They then give their own opinion in such way as to give it to be understood that they know more about the matter in question than he who takes it upon himself to advise them. This defect is all the more serious since it is precisely those who assert their great knowledge that are most ignorant, because they think they have nothing to learn. And they do it all in good faith! They are not the less mistaken, for I know no one who has nothing to learn. They are just like a certain girl, who thought herself pretty, though she was nothing of the kind. One day, she jokingly said to the curé: "Sir, when I look at myself in the glass, I fancy I am handsome: is that a sin?" "No, by no means, my child," replied the priest, "it is only a mistake."

We must not, however, absolutely condemn the local inspectors who sometimes hold an opinion opposed to that of the Inspector-general. On certain points in making, the best authorities do not agree. On these points, there ought to be, before each season opens, a friendly meeting of the Director-general, the technical director, and the instructor at the school, as well as of the Inspector-general, to come to an understanding on the disputed points, reserving their submission to the test of experiment during or before the season, in order to modify them later if necessary. In this way, we shall avoid many regrettable disputes that might prove injurious to

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progress. The local inspectors would be enjoined to follow such or such a method, without troubling themselves about their own personal opinion.

Some inspectors we have met who are at the same time sellers for their syndicates. Complaints have been made in some cases, that the inspector neglected his inspection in attending to the sales. We hold that it is unsafe for an inspector to join the two positions. It is very hard to prevent one of them from interfering with the other, unless the inspector has very few factories to visit or his district is very limited in extent.

*The third category of observations concerns the factory-proprietors and the makers.*

In very many places, the proprietors fetter the work of the syndicates which is to secure the best possible goods. They make the production of these superior goods impossible. I speak of those who fit up their factories in inferior buildings. The drying-rooms especially, are in some cases so bad that, during the hot weather, the best made cheese goes wrong in a few days. I wish the proprietors of these inferior factories would go and look at those in Prince-Edward-Island. I traversed this island, last September, to try and plant co-operative dairying among our Acadian brothers, and at the same time, I visited the factories already at work in the English districts. Co-operative dairying is yet in its infancy there, but what a fine cradle it has! The buildings, in which are the factories, are all models, and such as I dream of seeing all those of our province resemble. But, unfortunately, it is a dream that will, I fear, take a long time for us to realise.

In many cases, it is not surprising that the buildings are bad. In this province, there are so many of these factories, the erection of which is due to obstinacy, hatred, jealousy, pride, or a false ambition. A farmer, with a large herd of cows, finds his milk rejected at a factory on account of its bad quality. Instead of improving it, he starts a factory at home, in an old wooden shed, and gathers together the milk of all the discontented ones like himself. Only having a few hundred pounds of milk to deal with, he cannot, of course, make large outlay, nor can he pay his maker high wages.—Result:—Bad building, bad maker, bad goods.

This leads me to talk about small factories. Almost all the bother we meet with, now a days in the dairy-business, is caused by the small factories. The most skilful maker would find it hard to make good cheese in them, and, as it is always low-waged makers that are employed, third and fourth class men are engaged, and, in consequence, bad cheese is made in them. We have long been looking for a remedy to prevent people, in a parish where one good factory of 12,000 pounds of milk daily would be ample, from putting up six factories of 2,000 lbs. each. Six buildings, six sets of fittings, six makers! What a lot of money wasted in making goods which disgrace the dairy-industry, and give rise to the epithet, "French-cheese," with which it is intended to muffle up all sorts of inferior cheese, not only of that made here, but in the other provinces of the confederation. The motto of every one who is interested, in any way, in dairying, should be: "War on the small factories;" in fact, they should never exist, except where there is no possibility of organising a large one.

It is not easy to find a remedy for this state of things. Still, it would seem that the buyers might help us to cause to perish by inanition these sham factories. If they were to agree to pay for the bad cheese made in them a much lower price than they pay for good cheese, they would probably succeed in discouraging those who make it. Unfortunately, it often happens that when one tells the makers of inferior cheese that their ignorance, or carelessness, is making them lose money, they reply that their inferior cheese sells as high as their neighbour's good cheese, which is too often the case, indeed. As they are sure of receiving as much, they do not trouble themselves about the damage they may do, and really do, to the trade in general, and to the reputation of our cheese in England. They do not care about the rest, provided they make money. They are as philosophical as the woman, whose husband, insured for \$2,000 in a life insurance office, had just died; immediately she telegraphed to her sister: "Henri is dead: loss entirely covered by insurance."

What I said just now about the too learned inspectors, applies also to a class of learned makers, who seem to belong to the syndicates solely for the purpose of criticising the inspectors. Happy mortals, who have come into the world ready-breeched, and therefore want no tailor to dress them!

It is chiefly among the older makers that this class of makers is recruited. Among the young, it is different; an excess of devotion is their principal fault. They are familiar with the rules for making good cheese; they know that in cold weather the milk ripens more slowly and the work must be continued till later in the afternoon. But, what are they to do? In May, the young man must attend the service of the month of Mary; in June, the service of the Sacred-Heart; in July, that of the Bonne Ste. Anne; and in October, that of the Rosary; and these services occur for the most part at the close of the day. He must make haste, then, for if the maker or operator has not finished in time to attend the service, some pretty girl or other will be obliged to go alone, which is not nice; or have to take another lad with her, which is far from being agreeable to our friend. Of course, I am only joking; that our young folk like to amuse themselves, you will understand without my telling you, so they hurry to get through their work, and in order to be at liberty earlier in the evening, they neglect some of the details in the making-process, and leave the place dirty.

The inspectors should try to make them understand that a good maker must always be at his post, at the proper hours, and ought not to make the process of manufacture suit his own convenience, but accommodate his wishes to the demands of the process: no success otherwise.

*A last category of observations* concerns certain special subjects that I will review rapidly.

As propos of the syndicates, a good deal is said of the difficulty in getting paid. He share that the syndicated factories ought to bear in the expenses. I think the patrons ought to understand, better than they generally do, the great value of the syndicates to them. Their own profits depend upon the value of their goods, and,

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consequently they ought to contribute liberally to the cost of the syndicate. The fair proportion would be this: share of the expenses by the maker or proprietor in proportion to the salary received: if he receive 20 per cent., he should contribute 20 per cent.; if 15 per cent., he should contribute 15 per cent., and the balance should be paid by the patrons.

It appears that most of the cheese classed as second and third quality are of the coloured kind, and for this reason: the colour is not uniform, equal all over, but shows here and there layers of colour more or less deep than the body of the cheese. Such being the case, why do we persist in making coloured cheese, while the white sells just as well! This is another point to be investigated.

Another thing is the subject of criticism, and justly so, I think: it is the way in which some sales of cheese are made. In our district, for instance, we are told that at such a sale, at such a date, the cheese fetched 9 cts. a pound. But immediately afterward this assertion, we are told that out of the lot of 5,000 cheeses that were sold, only 3,000 reached 9 cts., and the rest were *cut* a quarter or half a cent. There are districts in which these *cuts* in price are never heard of, any more than a diminution of weight. The cheese is bought and weighed at the factory and delivered at the railroad-station, where it is paid for before it leaves, and then it is sold at its real value. The other system gives rise to many frauds, especially when prices have a downward tendency; then, the slightest defect is sought for as an excuse for *cutting* the price.

In my remarks, I have mentioned many defects that need correction, but it must not be supposed that I dream of their disappearing all at once. This I know to be impossible, and that frequently to grasp at too much means obtaining nothing. To aim too high throws the bullet over the target, and is as bad as shooting short of it, just as in the case of the drunkard who rode up to a tavern, dismounted, and after having drunk too much, found he could not get on his horse again. In spite of his imtemperate habits, he was naturally a pious man, and after some vain attempts to get into his saddle, the idea struck him that he would ask the Saints for aid to remount. His name was Pierre, so of course he began by addressing his patron Saint, and then gave a mighty spring: but that did not do. Then he remembered that, in the *Confiteor*, St. Paul comes next to St. Peter, and he begged his assistance: but the struggle to mount was no more successful than before. Then, calling to mind the omnipotence of the good Sainte-Anne, he exclaimed: "Oh good Sainte-Anne, do help me to get on my horse." And, then, making a tremendous effort, he succeeded in getting high enough to..... tumble over on the other side of the horse. Picking himself up as well as he could, he yelled out, in a rage: "Oh! I didn't want you to push, all of you at once."

In conclusion, I am going to make you some suggestions that may aid in remedying by degrees some of the faults I have mentioned.

One good way of making the inspectors more and more capable of discharging their duties properly and of keeping themselves *au courant* of all the new discoveries,

which are so constantly being made, would be to call together those who have regular diplomas to pass, every year, before the opening of the season, a week at the school with the Inspector-General, there to follow a special course of instruction.

As regards the improvement of the makers, besides the advice I have to give them to come, every one of them, and follow a course of instruction at the school, I think it would be judicious to have meetings every winter in each district, where the Inspector-General, the local inspector, the district-director or directors of this association, and the makers of the syndicated factories of the district, should meet. Thither should be invited too the makers of the unsyndicated factories, and, there, attempts should be made to put an end to the difficulties that exist between patrons and makers, makers and inspectors; I think a vast deal of good would flow from such meetings. If I have understood the intentions of the local minister of agriculture as regards this matter, I believe he is willing to pay the travelling expenses of the inspectors and directors who attend such meetings.

There is an important point to which I desire very particularly to draw the attention of the inspectors. I wish to advise them to strive, in their relations with the makers and patrons of their district, to persuade them all that nothing is more to their advantage than to organize farmers' clubs in their respective districts. This association has long ago felt that these clubs are highly fitted to aid in the development of our industry. The lecturers who address these clubs speak of dairying as the national industry of this province; they impart to their hearers a knowledge of the rotation of crops suited to it; they teach them sound notions about fodder-crops, dairy-cattle, agricultural implements, such as chaff-cutters, boilers, etc., as well as of the methods of preparing food, such as silage, the cutting up and the fermentation of fodder for milch-cows; in fact, they labour more than any men in the diffusion of information relating to our great business of dairying. During my tour last summer, I most particularly pressed the members of the clubs to attend the lectures we gave in every place, and I must say that, in general, a great many accepted the invitation.

The work of these clubs is certainly doing the greatest amount of good among our farmers. This is the opinion of the most noted men, of those who are in a position to study the great problems of rural economy. As a proof, I will repeat what Lord Derby, the late Governor-General, said lately. At Preston, in Lancashire, a short time ago, at a public meeting, he declared that Canada had made enormous progress in agriculture during the previous five years, thanks to the instruction by the model-farm managers and by the farmers' clubs that country possessed.

I will also mention the praises, which I heard from two noted dairymen, of our organisation of syndicates. M. Lezé, editor of the French paper "La Laiterie" (The Dairy), and professor of the school of agriculture at Grignon, France, expressed in our presence here, at St. Hyacinthe, where I was lucky enough to meet him, the frankest admiration of our syndicates; and he proved the sincerity of his admiration by publishing, after his visit, at full length in his paper, the statutes that govern these syndicates.

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The other dairy expert, whose opinion I venture to quote, is Mr. Derbyshire, of Brockville, president of the Ontario Creameries' Association, whose name is familiar to all of you. I met him at Chicago, where we both were in the interest of the Canadian Exhibition of butter and cheese. Seeing the superb exhibits of cheese from our province, he remarked: "M. Chapais, it is to your almost perfect organisation of factory syndicates that is due the immense progress you have made in dairying during the last few years, and especially the great success you have met with at this Chicago Fair."

Looking on these testimonies from two of the best dairy authorities on either side of the Atlantic, I was, I think, right in determining to detain you for so long a time while I was endeavouring to impress upon you the need of exerting all your powers to improve this our system of syndicates which, as you know, has already produced such marvellous results.

N. B. — Compare the lecture of M. Chapais with the complementary notes of M. Coté, (v. Supplement of the Report.)

The Secretary of the Association read the

REPORT OF THE SPECIAL COMMITTEE  
OF THE ST. HYACINTHE DAIRY SCHOOL.

*To the Members of the Board of Directors of the Dairymen's Association of the Province of Quebec:*

MR. PRESIDENT AND GENTLEMEN,

Appointed by your resolution of August 26th, 1892, and continued in office by a resolution of the 14th December following, your special committee of the St. Hyacinthe dairy school has the honour to present to you:

I.

*The special report, addressed last August by your Secretary to the Hon. Minister of Agriculture and Colonisation, Quebec, in the following terms:*

ST. HYACINTHE, August, 1893.

The Hon. Ls. BEAUBIEN,

Commissioner of Agriculture and Colonisation,  
Quebec.

SIR,

In conformity with the instructions received from your department on the 31st of July last, I have the honour to submit to you the following report concerning the Dairy School and Experimental Station at St. Hyacinthe:

Since its foundation in 1882, the Dairymen's Association of the Province of Quebec, in conformity with its object and the programme that it had traced for itself



from its inception, has never ceased to exert itself in organizing in the province the manufacture of butter and cheese.

The first instructors were inspectors, charged with the duty of visiting, when requested, the factories of members of the association and of giving lessons to the makers. To this system of instruction it soon added that given in a school factory, open during the season of making. This bi-form teaching was necessarily transitory, intermittent, and limited. Obligated to visit a large number of factories, the inspectors only, so to speak, passed through them. On the other hand, the school-factory only being open during the making-season, the makers being then confined to their factories, can only devote a few short days to the course.

As time went on, the travelling-instruction was remodelled; the organisation of the butter and cheese syndicates was an immense step in the road of progress, and replied so well to the needs of the moment, that from ten in 1891—the year of their creation—the number mounted to twenty-eight in 1893.

By means of this syndical organisation, that was soon to embrace the whole province, and through which, by means of a regular system of inspection, the incompetency of a great number of makers was discovered as a danger to the dairy interests of Canada, a model dairy school became a necessity, a school open at all seasons, destined not only to educate good makers of butter and cheese, but also to grant degrees to the inspectors of syndicates, and to follow up our experimental researches leading to the improvement of our dairy products.

In the course of 1892, having obtained from the legislature of Quebec a grant of \$2,000 in aid of a dairy school, and reckoning upon the continuance of this grant for a certain number of years, the association undertook to endow the province with an establishment worthy of itself, and began its operations, which were successful.

By an act received before Mr. J. C. Desautels, notary, of St. Hyacinthe, 9th September, 1892, the Seminary of St. Hyacinthe d'Yamaska made a gratuitous gift to the Dairymen's Association of a lot of land in the parish of St. Hyacinthe le Confesseur, on the banks of the river Yamaska, for the erection and maintenance thereon of a dairy school.

By the same act, the Seminary of St. Hyacinthe granted to the Dairymen's Association a loan of five thousand dollars, destined to the work of building and fitting up the said school, and repayable by means of ten annual payments of \$679.34 guaranteed by a mortgage on the land, buildings and fittings of the school.

By an act received before the same notary, November 16th, 1892, forty persons gave, in addition, to the Seminary of St. Hyacinthe their personal guarantee, to the amount of \$100 each, as collateral security for the loan, and, in consequence, the association handed over to them the ownership of the dairy school.

At the session of August 26th, 1892, the Board of Directors of the Dairymen's Association approved of the plans drawn up by M. J. de L. Taché, the secretary-treasurer. They comprised a building 40 x 60, with a creamery in the basement, a cheesery on the first flat, and a laboratory, lecture-rooms and offices on the second flat.

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The building, begun September 9th, was rapidly pushed on, that the factory might be ready for work by December 1st, and the school be ready to receive pupils on the following January 1st.

Doubtless, and so the Hon. Minister found it on the day of the official inauguration, there remained a good deal to do for the completion of the principal building, and of the accessories and surroundings of the factory. According to the accounts sent in to the Department of Agriculture, at the end of January, 1893, the work had then cost \$8,174.91, divided thus :

Buildings.....	\$5,125 81
Machinery and tools.....	2,571 86
General expenditure.....	475 24
	\$8,174 91

For the carrying on of the school the Association had made, from the 21st September, 1892, with Prof. Robertson, Federal Commissioner of Dairying, a bargain, by which he assumed the duty of theoretical and practical instruction, in both French and English, in the making of cheese and butter, as well as of the carrying on of the School and Experiment Station, for an annual stipend of one thousand dollars.

The opening of the school had been announced for the 2nd January, 1893. Two hundred and sixty-eight applications for admission were received by the secretary of the school.

As all the students wished to enter before the season of making began, and to devote to study periods varying from eight days to two months, it was necessary to class them in a series. It was thus organized :

1. A special course for candidates for inspectorships of syndicates, which had 40 students ; 36 were examined ; 13 obtained diplomas of inspector ; 13 provisional certificates ; the rest were put off to another day.
2. A two months' course from Jan. 15th to March 15th.
3. A one month's course from March 1st to April 1st.
4. A fortnight's course from 1st April to 15th April.
5. Courses of a week from the last date to the opening of the making season.
6. A special course for apprentices during April.

These courses were attended by 51 butter-makers and 123 cheese-makers, which numbers added to 40 inspector candidates, form a total of 214 students. The days of attendance at the school were 866 for the butter-makers=17 each ; and 1708 for cheese-makers=14 each. This average attendance on the courses is certainly very short, but we must consider, on the one hand, that most of those who came to the school were already experienced makers ; and, on the other, many of them, having proved for themselves the advantages to be derived from the school, intend to return next winter.

On March 11th, 1893, took place the official inauguration of the school. The April number of the *Journal d'Agriculture Illustré* contains an account of it. It was

then determined that it was indispensable that, as soon as the weather permitted, the most pressing complemental works should be proceeded with.

The completion of the galleries and of the receiving stage, the erection of a shed for the carts during the reception of the milk, a footpath from the road to the factory, levelling, roadmaking, the inside and outside painting of the school; these have led to the expenditure of about \$1,350, the details of which are annexed.

The Provincial Legislature having voted last session a sum of \$10,000 to the school, to be paid in five annual payments of \$2,000 each, under conditions to be fixed by the Lieutenant-Governor-in-Council; the Government and the Dairymen's Association have agreed, by contract, dated October 15th, 1893, to the obligations to which the Dairymen's Association shall be held in consideration of this grant of \$10,000.

The whole respectfully submitted,

E. CASTEL,

Secretary of the Dairymen's Association and of the Dairy School.

ADDITIONAL WORK DONE AT THE ST. HYACINTHE DAIRY SCHOOL DURING 1893.

Galleries, staging, shed and fence, by MM. Paquet et Godbout.....	\$555 00
Roofing the same, by Jos. Leduc.....	82 64
Making a footpath, by Magloire Benoit.....	17 00
Painting, by M. Coderre.....	174 27
Paints, etc., furnished by MM. Raymond et Frères.....	134 19
Steam heating apparatus, by M. Blondin.....	275 00
Levelling, etc., by B. Benoit.....	60 04
Wire, etc., for the fence, by J. H. Morin.....	48 05
Total.....	\$1,346 19

E. C.

II.

As a complement of the preceding, take the following report of the operations and work:

The account sent in, with vouchers, to the Department of Agriculture at Quebec, February, 1893, showed the expenditure previous to that date, as thus:

Buildings.....	\$5,125 81
Machinery and Fittings.....	2,573 86
General expenditure .....	475 24
.....	\$8,174 91

Of this amount M. J. E. Désautels, notary, St. Hyacinthe, to whom our committee had entrusted the duty, had paid at that date.....

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<sup>1</sup> The total of comes from an inc 21.14; and a decr total, 20.08. Diff



Which sum was paid by the Commissioner of Agriculture in February, 1883, and the accounts thereto relating were forwarded to him. <sup>1</sup>

At the official opening of the school, March 11th, 1893, the Ministers of the province, having requested us to push on the completion of the school, it was decided to finish the galleries and the receiving-stage, to build a shed to hold the carts while the milk is being delivered, and a footpath from the road to the factory, to level the ground, to make the road and the fences, and to give a second coat of paint, outside and inside, to the school, etc., etc.,

These works and some necessary articles cost, according to the details in the books of the association, and in the subjoined note C, the sum of. \$1,565 21  
To which should be added :

1. Paid by Notary Desautels (see account B).....	81 79
Total paid.....	\$1,647 00
And 2. The following remaining to be paid, on account C....	947 47
Total expenditure in completing the school.....	\$2,621 47

RECAPITULATION.

The total expenditure up to to-day (December, 1883) of the Dairy School, taken in detail from the books and accounts aforesaid, is thus divided :

IN COST OF	Buildings.	Fittings and Machines.	General.	Total.
Paid to Feb. 1893.....	\$5,125 81	\$2,573 86	\$475 24	\$8,174 91
Afterwards .....				
Paid by the Association.....	1,102 95	302 30	159 96	1,565 21
" by M. Desautels.....	33 34	24 45	24 00	81 79
Balance unpaid.....	436 57	537 90	.....	974 47
	\$6,698 67	\$3,438 51	\$659 20	\$10,796 38

The total receipts up to that day are :

COLLECTED BY M. DESAUTELS, NOTARY.

Sum borrowed by our Association from the College of St. Hyacinthe... .	\$ 5,000 00
On account from the school grant, 1892-93 .....	1,320 66
	\$6,320 66

<sup>1</sup> The total of the accounts paid sent to the department is \$2,032.66. Difference, plus: 1.06; comes from an increase in the account of Blondin, 20.79, and Mosely and Stoddart, 0.35: total, 21.14; and a decrease in the accounts of Bertrand, 18.08, and Paquette and Godbout, 2.00; total, 20.08. Difference, plus: 1.06.

COLLECTED BY THE SECRETARY-TREASURER.

Supplementary grant of 1892-93 .....	\$ 2,031 60
Payment of the grant, 1892-93 .....	679 34
1. On account of grant, 1893-94 .....	1,000 00
2. " " " 1893-94 .....	320 66
Price of Danish separator, sold at cost to the Dairy-fittings Co. ....	360 00
	\$ 4,391 60
Total.....	\$10,712 26

From this sum may be deducted, as applicable to the annual cost of the school:

Sum payable to the College for the extinction of the mortgage..	\$ 679 34
Sum payable to Prof. Robertson, for ensuring the carrying on of the school .....	1,000 00
	\$ 1,679 34

Remains, to be applied to buildings, machinery, etc .....	9,032 92
The total expenditure is.....	\$10,796 38
Total receipts are.....	9,032 92
But from each may be deducted \$360, price of Danish separator, as above, making—	
Total real expenditure .....	10,436 38
Total real receipts .....	8,672 92
	\$ 1,763 46

If you observe that there is no more to be paid on this sum than \$974.47, and that the Association has paid this year a total of \$1,565.21, you will see that the Association has been obliged to advance to the school from its ordinary funds..... 788 99

Difference.....	\$ 776 22
Second grant on account, 1893-94 .....	\$ 320 66
Price of re-sale of Danish separator .....	360 00
Balance of Mr. Desautel's account (31.77 + 50 + 13.79).....	95 56
	\$ 776 22

CONCLUSION.

In conclusion, your committee, gentlemen, is of opinion that, in its present state, the school is sufficient for the existing demands of instruction and of the carrying

<sup>1</sup> If to this deficit from the work on the school, \$1,763.46, be added the cost of doubling the number of inspectors-general, \$821.22, and the real deficit of the Association, \$28.11, we have the real deficit of the Association at the time of the convention, \$2,622.79. The Commissioner of Agriculture has since paid over to the Association \$2,600.

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out of our problem; but that, probably, before long, certain additions to the factory, to the fittings of the school and of the laboratory will be found necessary.

And, considering the accustomed liberality of the Legislature, the committee advises you to submit to the Commissioner these future wants, in the hope that he will find it easy to enable you to increase, in time and place, the efficiency of the school, whose reputation is already on the increase. We have received flattering requests for admission from Ontario, New Brunswick and Prince Edward Island: like noble birth, high reputation demands upright dealings.<sup>1</sup>

The whole respectfully submitted.

The Special Committee of the Dairy School,

S. A. FISHER, Chairman.  
J. DE L. TACHÉ,  
I. J. A. MARSAN,  
L. T. BRODEUR,  
ALEXIS CHICOINE,  
E. CASTEL, Secretary.

ANNEXES.

Account A. }  
" B. } Will be published at the end of this volume.  
" C. }

LECTURE BY MR. J. DE L. TACHE.

PAYMENT FOR MILK IN PROPORTION TO ITS RICHNESS.

*M. Taché.*—I must tell you, gentlemen, that I have not had time enough to prepare a lecture. The fact is I have nothing written out. The subject of my remarks, the tables I shall show you, are an abridgment of our last season's work. I shall content myself with making some observations, explanatory of these tables, and this will be my lecture.

For the last two or three years, the Association has been specially interested in the question of paying for milk in proportion to its richness. If there has been a difference of opinion as to the ease of applying this new method to the cheeseries, there has never been any as regards the creameries.

This year, in twelve out of a total of fourteen of our creameries, milk has been paid for in proportion to its richness, and our patrons, the great majority of them, are convinced of the superiority of the system.

I shall tell you, first, how we have proceeded, and why; and will then give you the result of our first season under the Babcock régime.

<sup>1</sup> As we go to press (April 1st, 1894), the St. Hyacinthe school has received 248 pupils during the winter, and 50 more are expected before the opening of the making season.

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Our creameries lie very far apart. Our makers are as busily employed as the employés of the other creameries of the Province; many of them have no other experience of the Babcock than what they gained by a few days passed at the school.

To avoid fitting up a laboratory at each of our creameries, to escape adding extra work to our men, who had already enough, but especially to prevent the occurrence of mistakes which badly managed tests would almost certainly cause—there must have been some in such a number—and thus to avoid dangerous disputes which the introduction of this novelty might create, we thought that it would be best, on all accounts, to set up a central laboratory, better arranged than could be those of the ordinary factories, directed by an expert, who had nothing but that to look after, and was quite unconnected with our patrons, and whose duty it would be to receive, at fixed periods, the samples taken, day by day, from the milk sent in by the patrons of each of our factories.

The proprietors of creameries and cheeseries, who know on what caprices the great interests they have in them depend, will very easily understand the force of the reasons I have just brought forward.

We have, however, one factory, with a skimming station, where the maker himself tests the milk.

I hasten to say that the central laboratory involves an annual expense that may be avoided, in part, if the maker himself can make the tests properly, and if he has sufficient influence on the patrons to get them to accept his work with confidence. It was not, then, for economy's sake that I undertook this affair; I wanted to make the process clear to the public, and I took every pains to secure conditions that made success certain.

The installation of the laboratory, the purchase of a small steam boiler, of the bottles to contain the samples, and of the packing-boxes to hold them, etc., cost us \$300. Our expert's salary, the cost of working the laboratory, freight charges, very high in our case, raised our current expenditure to about \$700. M. Beaubien, the Commissioner of Agriculture, gave us the same grant as to the syndicates, viz., \$250.

To begin our work, I started last spring by asking the patrons of our fourteen creameries if they were inclined to try the plan of payment for milk according to its richness throughout the year; they all agreed to do so.

After a month's time, some of the patrons of two of these creameries, for reasons known to themselves but not to me, said that the system was worthless, and gave us to understand that we must not only discontinue the plan of paying for milk according to its richness, but even give up the supervision of the patron's milk by the use of the Babcock.

In the other twelve creameries the payment for milk on this principle was applied throughout the whole season, and, as the general result, I am happy to say that the patrons were so well pleased with it, that the great majority in each creamery refused to return to the old plan of making the dividends according to the weight of the milk alone.

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It is hardly necessary to say that out of from a thousand to eleven hundred patrons who delivered milk at these creameries, a good number tried to test the correctness of our tests, either by keeping back skim-milk, or keeping back cream or the strippings, in order to be sure that we were not imposing on them.

The fact that the system was accepted by the great majority so easily, shows clearly that the payment for milk according to its richness supplies a want in, and a necessity to, the proper management of our creameries.

When every careful patron is sure of receiving the additional profit that richer milk would give, breeding will soon improve and the cows be better fed; when every careless or fraudulent patron is threatened each morning with being a sufferer in his pocket for his negligence or fraud, then these two great scourges of the creameries will vanish of their own accord, or at least will only affect the real culprits.

I can assert that our laboratory was carried on under conditions such as are easy to create all over the Province, and that from the like excellent results may be obtained; besides, we have only done what has been done elsewhere successfully.

I was afraid, at first, of the difficulty of sending the samples, several of our factories being situated from eight to twenty miles from a railroad, and from Quebec, by rail, from twelve to one hundred and thirty miles. With a few exceptions, during hot weather, they all arrived in good order. In these exceptional cases we would not make the tests because the samples, when they reached the laboratory, were partly churned. It was easy to trace the cause of this in every instance. In hot weather the dose of the powder that is used to keep the milk fluid must be increased. We shall, this spring, change the composition of the powder a little, to make it more efficient. The sample bottles must be kept in the ice-room when not in actual use; and when shaking the bottles daily, before and after the taking of the samples, the maker must not shake them too violently. I think I am justified in saying that this partial churning most frequently occurs in the case of milk delivered in bad order by the patrons.

I was rather impatient to ascertain clearly the best way of taking samples so as to get at the average richness of the milk furnished by the patrons. After having made several trials in different factories, I am now sure that it is easy to take accurate samples: draw them from the weighing-can, after having carefully stirred the milk that has just been poured into it. The few little scraps of butter that may sometimes be seen on the milk, if care is taken not to include them in the samples, cannot affect the conclusions of the Babcock; they are too small in quantity to have any effect on its indications.

Now, here are three tables which show, in an abridged form, our work of last summer. The factories are indicated by the numbers 1, 2, 3, etc.

By table 1, it is seen that we have registered at the laboratory and at the factories 11 and 12, in which the lists were made at the factory itself:

13503 tests of whole milk ;  
 96 " " in duplicate as a safeguard ;  
 403 " of skim-milk ;  
 12 " " in duplicate ;  
 337 " of butter-milk.  
 In all 14351.

TABLE No. 1.

NUMERICAL STATEMENT OF THE TESTS MADE 1893, AT THE LABORATORY.

No. in order of the Creameries.	Whole milk.		Skim-milk.		Butter-milk.		Totals.
		Tests in duplicate.		Tests in duplicate.		Tests in duplicate.	
1	882	7	51	.....	45		985
2	983	5	38	.....	28		1054
3	665	.....	25	3	22		715
4	1805	5	24	.....	24		1858
5	1546	6	18	1	15		1586
6	1573	17	15	.....	8		1613
7	702	2	46	.....	16		766
8	2064	20	11	.....	11		2106
9	1055	5	23	7	22		1112
10	564	29	68	1	63		725
11 (1)	857	.....	60	.....	60		977
12	266	.....					
Totals.....	12962	96	379	12	314		13763
13	271	.....	5	.....	5		281
14	201	.....	8	.....	7		216
Tests for other persons and other creameries.....	69		11		11		91
Totals.....	13503	96	403	12	337		14351

Table No. 2 gives the averages of fat per cent. every month, in the 12 factories, and the last column gives the general average of the year at each factory.

The very great uniformity in the richness of the milk in these different factories must strike every reader. Facing the last column of this table (fat per cent., average of the year), I place the yield in butter (butter from 100 lbs. of milk yearly average).

Nos. of the factories.
1
2
3
4
5
6
7
8
9
10
11
12

Table N  
1892.

COMPARAT

Factories.



1893

Butter from  
100 lbs. of  
milk.

1892

Butter from  
100 lbs. of  
milk.

1893

Increase.

1893

Increase in  
money per 100  
lbs. of milk,  
with butter at  
20 cts. a lb. \$



TABLE No. 2.

FAT PER 100 LBS. OF MILK; MONTHLY AND YEARLY AVERAGE.

Nos. of the factories.	May.	June.	July.	August.	Sept.	October.	Nov.	Average per cent. fat of the season.	Percent'ge of butter to milk of the season
1	.....	3.40	3.69	3.96	4.13	4.60	4.69	3.86	4.38
2	3.70	3.68	3.78	4.17	4.48	4.69	.....	4.03	4.61
3	8.28	3.52	3.76	4.16	4.46	4.65	.....	3.93	4.48
4	.....	3.62	3.78	4.11	4.37	4.66	5.10	4.14	4.86
5	.....	3.64	3.95	4.04	4.35	4.57	4.79	4.06	4.76
6	3.33	3.61	3.58	4.07	4.41	4.56	4.83	3.96	4.72
7	.....	3.57	3.74	4.15	4.34	.....	.....	3.86	4.49
8	3.25	3.60	3.81	4.03	4.28	4.55	.....	3.93	4.52
9	.....	3.50	.....	3.88	.....	4.63	.....	3.98	4.63
10	.....	3.46	3.79	4.02	4.50	4.42	.....	4.02	4.76
11	3.63	3.58	3.94	.....	4.06	4.21	.....	3.90	4.27
12	.....	.....	3.95	.....	4.03	4.30	.....	4.08	4.44

Table No. 3, shows the comparative yields of the same factories in 1892 and 1892.

TABLEAU No. 3.

COMPARATIVE STATEMENT OF THE YIELD IN BUTTER FROM 100 lbs. OF MILK IN 1893 AND 1892.

Factories.	1	2	3	4	5	6	7	8	9	10	11	12
1893												
Butter from 100 lbs. of milk.	4.38	4.61	4.48	4.86	4.76	4.72	4.49	4.52	4.63	4.76	4.27	4.44
1892				Was none.								
Butter from 100 lbs. of milk.	4.20	4.37	4.23	Was none.	4.59	4.61	4.09	4.62	4.69	4.57	4.27	4.18
1893												
Increase.	0.18	0.24	0.25	.....	0.17	0.11	0.40	.....	.....	0.19	.....	0.26
1893												
Increase in money per 100 lbs. of milk, with butter at 20 cts. a lb.	\$0.036	\$0.048	\$0.050	.....	\$0.034	\$0.022	\$0.080	.....	.....	\$0.038	.....	\$0.052

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Totals.

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1586  
1613  
766  
2106  
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725  
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This table is a summary of what I intended to show by this lecture.

There was no factory No. 1 in 1892. Factory No. 11 got exactly the same results in both years, but it must be said that the robbery of \$1,500, belonging to the patrons, at the secretary-treasurer's, caused the majority of the patrons to retire in October; without this, the average yield of 1893, which was considerably affected by it, would have been superior to that of 1892.

In the factories Nos. 8 and 9, the yield of 1893 was less than that of 1892, from causes that it would be useless to explain, but with which the Babcock has nothing to do. In the other eight factories the percentage of butter to milk was so much increased as to give to our patrons the following sums, as the result of paying for milk according to its richness at these factories. These sums are got at by multiplying the milk received during the season, by the value, at 20 cents a pound, of the increased yield in butter per 100 lbs. of milk :

At Factory No. 1 the increased yield was equal to.....	\$174 14
“ “ 2 “ “ “ .....	198 06
“ “ 3 “ “ “ .....	161 18
“ “ 5 “ “ “ .....	266 37
“ “ 6 “ “ “ .....	196 32
“ “ 7 “ “ “ .....	196 62
“ “ 10 “ “ “ .....	127 68
“ “ 12 “ “ “ .....	99 85
Total.....	\$1,420 22

Thus, for having accepted payment for their milk according to its value as settled by the Babcock, as advised at our Association's conventions, the patrons of eight of our factories have gained the sum of \$1,420.22 in the proportion shown above.

This is, indeed, proof positive of the good results that proceed from the use of the Babcock in paying for milk in proportion to its richness. And this proof is all the more positive that, in general, makers found the yield in 1893 less than the yield in 1892. This I have heard asserted by many persons present at this meeting.

You have here set forth the result of our first season under the *régime* Babcock. This first experience has been highly satisfactory, but I am convinced we shall do even better next year.

What is the most satisfactory part of this system is that not only are the patrons more careful in every respect, but the proprietors of the factories and the very makers have therein a capital means of estimating the work done for the patrons. By paying for the milk according to its richness, the exact richness of the milk of each factory is established, and it can be proved afterwards if the yield in butter corresponds with the richness of the milk. The makers take, or ought to take, every day, samples of the skim and buttermilk, to prove if any losses are caused by the skimming or the churning.

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If you refer back to Table 2, you will see by the two last columns that the yield of butter per 100 lbs. of milk is very far from being as uniform as is the richness of milk in the different factories. It must thus be acknowledged that all the makers have not made the same good use of their milk, and consequently, that we are confronted by cases of positive loss by some of them.

When I say loss, we must understand one another. Thanks to the Babcock, our yields are better than last year; but, thanks equally to the Babcock, we are convinced that the results are not the same in all the factories, and it is already a great step gained to be able to point out to this or that maker that, although his work was relatively satisfactory, he might do still better.

We must also allow that, however skilful and intelligent a maker may be, it must be hard for him to perceive, with his unaided eyes, in the skim-milk or butter-milk losses that are produced therein, until they become pretty weighty; it may happen that the skimming and churning have been imperfectly done during several days.

I may state, *en passant*, that losses in churning are usually more important than is supposed. I think I may tell you that one of the chief reasons of loss in churning is that in factories the churn is often too small, and so, when milk is abundant, this churn has to be filled too full.

Insufficiency of maturity in the cream is the most frequent cause of loss in churning during autumn.

Since I am on this subject, I will add that in general much loss occurs in autumn skimming, because the feed of the separator is not slackened as the season advances. In Europe, they calculate that if a thousand pounds are skimmed an hour in summer, this quantity should be gradually reduced till, in the late fall, not more than 600 to 700 lbs. should be skimmed in the same time. It is easy enough to calculate the proportion to be followed in machines of greater capacity; in a word, the quantity skimmed an hour in autumn should not exceed two-thirds of that skimmed an hour in June and July.

The better to show what an excellent means of control the Babcock affords, I have to say that, having considered the services of an inspector necessary up to last year, I am at present determined to do without one, for the *régime* Babcock and our central laboratory enable us to watch over, even when far off, the delivery of the milk, its skimming and churning, the three great points essential to a good yield. It may not be useless to add that we visit our creameries pretty frequently, in order to ascertain the quality, too, of the butter made there.

N. B.—The lecturer then gave certain pieces of information on the use of the Babcock, which will be found further on in the Bulletin.

#### FREIGHT OF COMMERCIAL FERTILIZERS.

*Mr. Barnard.*—Before closing, I have an important observation to make to you. It is generally said that farmers complain that their business is not profitable. A field



is ploughed, sowed, harrowed, all the work possible to be done on it is done, and often, too often, at harvest the crop is a poor one. The land sown was poor; but it takes as much work to sow a poor field as a rich one. What is wanting to the farmer, or rather to the land, is manure. I am certain that if farmers could get commercial fertilizers at a reasonable price, farming would infallibly become more profitable; but, at present, there is a very real impediment to their use, *i.e.*, the exorbitant cost of freight. This it is that prevents farmers, however much they stand in need of artificials, from using them. It is said that the freight on them is \$1.40 a ton per 100 miles; this is absurdly high. We have already entered into negotiations with the railroad companies to induce them to lower their charges to a reasonable rate, but up to the present time without success.

In spite of all, not despairing of making the companies see at last that this change would be as much to their advantage as to that of the farmers, since its first effect would be a considerable increase of traffic, I propose the following resolution: That the railroad companies be earnestly requested to adopt a special tariff with a view to the favouring of: the use of commercial fertilizers; the improvement of cattle, by the importation of thoroughbred breeding-stock; the exchange of the best seed-grain, etc., and the introduction of improved implements.

That by reducing the present tariffs, which are relatively very high, we have reason to hope that the use of commercial manures will have almost invariably the effect of doubling and tripling the crops, thus increasing in a very notable proportion the crops to be carried, which would repay a hundred fold the trifling sacrifices the railroad companies are invited to make by a liberal reduction of their tariffs.

Mr. Barnard's resolution was unanimously agreed to.

*The Secretary* announced to the members of the Association that M. l'Abbé C. A. Beaudry would continue to take subscriptions to *The Country Gentleman* and *The American Agriculturist* at the rate of \$2.50 a year.

#### PROSECUTIONS AGAINST PATRONS WHO CHEAT IN THEIR MILK.

*M. Taché.*—During this afternoon's discussion, we forgot a question concerning the patrons of cheeseries and creameries. I want a resolution passed, requesting from the Federal Government some means of obtaining a prompt conviction before the courts of dishonest patrons. It would be very useful; for these convictions are at present very difficult to obtain. A patron brings milk of 3 per cent. of fat; I know of such a case. He, with a brazen face, delivers this at the factory, is prosecuted, and, for reasons which I shall not enquire into, is not convicted. People said he had been the victim of some accident which had lowered the richness of his milk to 3 per cent., whereas his average had previously been 4 per cent. This often happens. By my proposal, I aim at securing *an average richness of milk* fixed by law, and I think that this would greatly facilitate the operations of our factories.

*M. Courchesne.*—I have sometimes thought that it might be possible to furnish

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the inspectors with bottles in which to take samples of milk in every factory. They would submit this bottle (*to the judge?*) in cases of fraud, and I think that would be sufficient, that it would be proof enough at law to convict a dishonest patron.

*M. Taché.*—I see no guarantee in this; it would certainly not be sufficient evidence. The judge might take upon himself to fix an average richness for milk, and the official bottle would have no effect. What is wanting is an average richness fixed by law. I propose, then: That we communicate with the Federal authorities on the subject of the establishment by law of a minimum standard of the richness, in fat, of milk sent to the cheeseries and creameries. *Carried unanimously.*

#### PORT-SALUT CHEESE.

*M. Brodeur* contributed samples of Port-Salut cheese, made at Oka by the RR. PP. Trappistes. He said it was a very excellent cheese in every respect, very superior indeed. It must be so, he observed, as it cannot be bought anywhere for less than 25 cents a pound. If dairymen could succeed in making cheese that would fetch that price, they might boast of having obtained the greatest success any one interested in the business could hope for.

The cheese was considered to be of excellent quality by all the members of the Association who tasted it.

#### GREEN FODDER-CROPS.

*M. Veilleux.*—Feeding cows on green fodder has been mentioned. Would there be time enough, before the session closes, to give some explanations on this way of feeding cows?

*M. Bourbeau.*—In my parish, last year, I met a man who had sown four arpents of fodder for green-meat for his cows. This was at the beginning of June. When fit to cut, he gave it to them twice every day. At the club, last fall, he gave us the results that he had obtained from this system of feeding, viz., the quantity of green-meat he had used in the summer and the weight of milk yielded by his cows. The results astonished us all. The time that the cultivation of the fodder had cost him was paid for thrice over; he only gave it night and morning, and the milk he got all through the summer was surprisingly rich. We enquired of him how he fed his cows. He kept them in from evening to morning. The cows did better, and there was no loss of dung. Other men there are who, to my knowledge, instead of keeping their cows in at night, prefer keeping them in the house all day and feeding them there, to protect them from the great heat; but, after our friend's experience, the former system we think the better of the two. These results I have witnessed. If it were not so late, I would ask for information on this subject from those more experienced than I.

#### PLOUGHING.

*M. l'Abbé Chartier.*—I will not detain you long, for it is late. There is one question which has not been discussed at this meeting, but which, you will agree with

me, is not unimportant: I mean *ploughing*. It is unfortunately too true that our ploughing is very badly done, excessively badly done, and that good ploughmen—there are some, no doubt—are too few in number.

The Clubs have already tried many plans of improvement. We have passed many resolutions during this meeting; would it not be *à propos*, before separating, to pass one praying the Department of Agriculture to lay down rules to be observed by the Clubs on this subject? Would it not be *à propos* to ask the Department to induce the Clubs to establish ploughing matches in every parish? That ought to have the effect of encouraging our young men, who are still able to escape from routine practice, to improve their ploughing; for, it must be repeated, our young men cannot plough. They can plough as their fathers ploughed, and they often plough even worse than they did. But ploughing is of the greatest importance to the farmer, both as to crops and to the preservation of the fertility of the soil, so that I hope for the support of all the members of this Association when I propose, as I now do: That the Department of Agriculture be prayed to induce the Farmers' Clubs to grant prizes for the best ploughing.

*Mr. Fisher.*—I highly approve of M. Chartier's proposal. He is quite right in saying that ploughing is most important, and, unfortunately, he is also quite right in saying that its importance is not sufficiently appreciated. The son farms as his father farmed, and very often worse, and it is in this way that farms, and consequently the men who farm them, are ruined. I second, then, the motion of M. Chartier, and I trust that it will produce good results. *Carried unanimously.*

The Convention closed at 5.30 p.m.

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## SUPPLEMENT TO THE REPORT OF THE CONVENTION,

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NOTE.—The following essays should have been read at the meeting, but time having been wanting for that purpose, it was decided, as in previous years, to include them in the annual report.

It was also thought right, in conformity with art. 1755, R. S. P. Q., to publish an abridged translation of the instructions of Dr. Babcock for the use of his method of testing milk; as well as of the conclusions arrived at by Prof. L. L. Van Slyke on his learned investigations of the connection between the casein and the fatty matters of milk in the manufacture of cheese.

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 COMPLEMENTAL NOTES TO THE REPORT OF M. SAUL COTÉ.
 

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## FACTORIES AND THEIR OUTHUSES, DRAINAGE.

The reason why we have so many badly constructed factories is that, in general, there is not enough milk sent to them to make it worth while to build better ones, or that people are too mean to understand that, if we want to keep on advancing, we must get rid of those inferior, badly-built (*mal closes*) factories, badly lighted, badly ventilated, unhealthy from want of drainage, and having only unsound vats for the reception of the whey or skim-milk. I advise the makers that hire out not to work for proprietors who either cannot or will not follow the path of progress. If they do, they will lose their reputation—if they have any—as makers.

Factories, even well built ones, should be white-washed every year on the outside, for appearance's sake as well as to make them cooler in hot weather; and inside to make them lighter and more healthy. I may be told, the lime in the white-wash falls off and dirties the floor; if it is mixed with salt or whey, and laid on in thin coats, it will stick closely enough.

All other things being equal, the drying-room is always better to be in the lower part than in the upper part of the building.

Many creameries have neither a good ice-house nor a good cellar for the butter.

## IMPLEMENTS IN THE FACTORIES.

Inferior implements, etc., are rarer than inferior buildings. Still we often find too many of those common scales that never give satisfaction; in fairness, it must be said, too, that some makers have consciences less susceptible than their scales, since they blunt their consciences in order to seem to get a better yield than their neighbours.

We also too often remark:

That the boilers are too small to allow of the heating of the curd without letting down the steam so that the boiler may be filled up again (*with water*).

That the steam pipes have defective valves, which let the steam enter under the vat, after they are shut; and there are no India-rubber tubes to let the steam into the interior of the vat; also vats that do not heat equally all round, and often so badly made that they are very hard to keep clean;

We also find curd knives, the blades of which are unsoldered and cannot cut the curd regularly,—I have even seen many that are made of stout tin, with blunt blades, which tear instead of cutting the curd;

And we meet with badly polished rakes, that break the cubes of curd in stirring. There should always be two rakes; one after McPherson's model, the other, a smaller one, like a hay rake;

Also, mills that rather tear than cut the curd;

As well as presses, in which cheeses that stand erect cannot be turned out.

## GENERAL CARE OF THE FACTORY.

A very great number of our creameries and cheeseries are not kept as they ought to be. It is very sad, all this neglect, want of tidiness, laziness among the makers.

In the same way as I advise makers not to engage with proprietors who cannot furnish them with suitable means of success, so I advise proprietors not to hire a maker without ascertaining, not only that he knows his trade, but also that he is orderly, cleanly, active, quiet and civil; without this, the proprietor will be exposed to much trouble.

For a maker, who does not possess these qualifications, will not have sufficient influence on his patrons to persuade them that they should bring in their milk in better condition than they usually do.

In order that a maker may, rightly, demand of his patrons that they bring their milk to him in good condition, he must preach by example, that is, he must show that his factory is well kept in every sense. Everything that comes in contact with milk, cream, butter or curd must be thoroughly washed every day, and dressed down with salt or lye at least once a week. Not only the inside but the outside of the vessels must be kept clean; and more, the walls, doors, windows, ceilings, and floors, beginning with that of the reception-porch (*tambour*), and not forgetting the scales, must be kept perfectly spotless.

There are factories where one would say that the maker had been taking pains to dirty the walls and doors; where the panes of glass are clouded; where the ceiling is almost entirely hidden by cobwebs; the floor very much oftener dirty than clean, and the shoot that carries off the water used for washing-up, seldom well cleansed out. Even if this last is cared for a little inside the building, all the filth it carries outside is allowed to remain close to the factory, there to putrify and infect the passers-by and the villagers; and just so with the parts round the skim-milk or whey-vats; and yet every one knows that throwing a little lime about from time to time in these different spots, would destroy all bad smells.

There are still some makers who persist in the bad habit of using the tub, intended for heating water in, for certain washings-up, such as the curd-cutter, for instance. It is not hard, though, to see that it is impossible to keep water clean, for other washings-up, if this practice is persisted in. Why not keep this tub solely for heating water in, and have another to wash up in? There are many factories where it is difficult to find anything to wipe one's hands on except cheese or butter-cloths, so scarce or filthy are the towels. A cleanly or careful maker should, after he has used a towel, have it washed and dried for the next occasion. One piece of work he should never forget at the end of each day's work, is to see that all the linen he has used, etc., be washed and put to dry in a suitable place: near the boiler, say: so that on the morrow, when he enters the factory all the linen may be clean

and in order to be made.

This quality of cloth; these washed in than white colate the n rose. Care clean.

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Milk being it into goods of yielded by cow and salt be at t cooled enough bad smell, until ings together, t being added to

and in order. With empty salt-sacks as many *torchons* as are wanted can so easily be made.

This question of cloths leads me to think about the strainers made of cheese-cloth; these are the best, on condition that, as soon as used they shall be at once washed in hot water and soapsuds, and not, as is too often seen, be any other colour than white and be thickly encrusted with filth so that they will hardly allow to percolate the milk, to which they communicate an odour certainly not like that of the rose. Care, too, must be taken that the sheets that cover the milk-vats, be always clean.

And it is not only that which is outwardly apparent that must be kept tidy in a factory; but every corner and recess must be so too, for what the eye does not perceive the sense of smell may detect, and the flavour of the butter or cheese will also tell tales.

I have seen, in more than one creamery, separators, that appeared to have been well washed out, smelling very badly in the interior, because they have not been cleansed with sufficient care.

Too much neglected, too, in some places, are the vats for skim-milk and whey; we still find plenty of them that are rarely emptied and washed out. I think, however, that many difficulties arise from this neglect, especially in the cheeseries, where this omission is more usually observed. The bits of curd quickly turn rotten, and spoil the stuff that is carried home from the cheesery for the stock, and make the cleaning of the cans very difficult; wherefore, the full milk arrives at the factory in a less perfect condition, because of the little care devoted by some of the patrons to the cleaning of their cans.

In the factory and its surroundings, everything should have its own place.

As we must not forget men, while thinking of things, I must beg more than one maker of my acquaintance to take more care of his personal appearance, *i.e.*, that is, not to omit washing his face so often, as well as his hands and arms, and to clean his nails otherwise than in stirring his curd; for, it must be confessed, there are many makers whose hands are cleaner after their work than before. We also meet with makers who are not any too careful about the choice and care of their working clothes, which are often disgustingly filthy.

#### CARE OF MILK.

Milk being the raw material of butter and cream, it is very clear that to convert it into goods of the best quality, it must be of the best quality itself. Milk should be yielded by cows in good health, well fed on sound food; their water should be pure, and salt be at their command. As soon as drawn, milk should be strained, aerated, cooled enough for the season, and kept in proper vessels, in a place where there is no bad smell, until it is taken to the factory. If it is necessary to mix different milkings together, the fresh milk, after being strained, must be aerated and cooled before being added to the staler milk. It is a very good plan to stir lightly, but frequently,



the milk that is intended to be kept for a little time, in order to prevent the cream from rising: which occasions a loss. This stirring should be repeated twice or thrice, at least, in the case of the evening's milking. What I have just said about the care to be bestowed on milk to make it fit for making good butter and cheese, is not hard to follow; still, there are but few patrons who observe these simple rules. They are not rare, however, who take but little pains to treat their milk properly, and these careless ones are the most troublesome. Why, with their milk, either not strained at all, or badly strained at best, un aerated, kept at any temperature God pleases to send—I said *kept*; I ought to say exposed to every kind of fermentation in cans hardly even rinsed out, left frequently for the whole day full of skim-milk, sour as vinegar, and sometimes even putrid—with such milk, I say, they expect us to make butter or cheese of the best quality; in such a state as this no milk can make a good article, however skilful the manipulation. And, again, if we did not so often meet with not only carelessness and inattention to cleanliness, but distinctly with some patrons, whom I would designate *strippers, skimmers, waterers!*

There are some with droll sorts of consciences; such are they who wouldn't keep the strippings, or skim ever so little, or add a drop of water before taking it to the factory (oh! no, they are too good for such tricks), but, for example, that do not hesitate to leave the can, with the evening's milk in it, out of doors all night, even when it looks likely to rain, even if it is not under the eaves of the house; as if rain-water was likely to make more butter or cheese than well-water. Just as if these people said: "Oh Lord, I would it might rain into my milk, but if thou art absolutely opposed to my being guilty of such a robbery, thou hast only to miraculously cause that the rain shall fall everywhere except into my can, which is there and wide open." Others, less guilty, but thoughtless enough, will take the milk for family use from the top of any vessel, in which it may have been reposing for several hours, without seeming to understand that they are taking far too much cream with the milk, as it has partly risen to the surface.

If the proprietors have good buildings, well fitted up, and if the makers keep these establishments as I wish them to be kept, I assert that they have a right to exact from the patrons milk of good quality in every respect, and to refuse positively any that is not so. By acting differently, they are unfair to those patrons who, attentive to their duty, bring them good milk, for these are made to suffer loss by the tricky or careless deeds of others. I said, refuse positively, because I strenuously oppose the method that some makers follow of accepting more or less damaged milk, on condition of deducting, at discretion, a certain percentage from its weight; because the maker will be led to deduct more rather than less, in order to enhance his reputation, to the injury of the neighbouring maker, by trying to make it appear that he makes more butter or cheese from a certain weight of milk than the other does. Milk is either good or bad; if it is good, accept it and credit the patron with full weight; if it is bad, refuse it.

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## CHEESE-MAKING.

Here begins the most difficult part of this essay, because I shall enter into the details of the making, properly so called, of cheese, so as to demonstrate the causes whence is derived inferiority of aroma, body, texture, colour, and general appearance; I shall then give some instructions how to prevent these numerous faults.

## AROMA—FLAVOUR.

If the milk is delivered in as good order as it ought to be, and if the maker keeps his factory and all his materials as tidily as I advised him, bad flavor in cheese must be attributed to other causes. But before studying these, I will bring forward two facts, among others, which came to my knowledge last summer, in order to show makers the necessity of keeping everything with which milk is likely to come into contact as clean as possible. The cases I speak of concern two makers, masters of their trade, since both had fine cheese to prove it, but, some days after making, their cheese began to take on a very nasty smell.

The proprietor of one of these factories, a progressive, zealous man, had vainly sought for the cause of the defect, both inside and outside his building, when M. J. C. Chapais, Asst. Com. of Dairying of the Dominion, Mr. H. Livingston, professor at the St. Hyacinthe Dairy School, and I, arrived there in a lecturing tour we were making through the creameries and cheeseries of the province. After a minute examination, we discovered that the shoot delivering the milk from the weighing-can to the vat was very foul. The maker, a good lad, set to work, thoroughly washed out the shute, and the defect in the cheese vanished.

In the other case a part of the tap of the weighing-can had been replaced by a piece of wood, which, from want of attention, had become unpleasant to the smell. This tap was cleaned as thoroughly as possible—it ought to have been replaced by a new one—and the aroma of the cheese was improved. It was the germs in the stale milk that remained in the shute and the tap that infected the new milk that passed through them.

Let us now study the other causes that give a disagreeable flavor to cheese. They are :

1. Bad smells in the factory occasioned by impure water or other things. Impure water is a very frequent and serious defect in factories.
2. The use of bad rennet that gives its flavour to the cheese: too weak or bad-smelling rennet ought never to be used.
3. Making too moist cheese, which will become sour, especially in hot weather.
4. Curd remaining too long in the whey, for want of the milk having been allowed to ripen sufficiently before adding the rennet.
5. The contact of the curd with anything having a bad smell; steam from impure water; dirty sheets; ill-cleansed curd-mills; dirty moulds, pressers (*fouleurs, pieces of wood, etc., on the cheese at press?*), bandages; foul presses; and lastly, the

drying-room, where the shelves are not cleaned down after each sale of cheese, or that contain confined anything with a strong smell, such as newly-made boxes.

6. Badly built drying-rooms, that allow the cheese to suffer every change of exterior temperature, and are particularly dangerous in hot weather. This too frequently occurs.

I will give a cheap and easy way of controlling pretty fairly the temperature of the drying-room during the heat. This is, to have not only a good ventilator to let the hot air escape, but also to introduce a current of cool air by digging a four feet ditch about 100 feet long, at the bottom of which is placed a tube about 8 inches square, emerging from the ground at its end for about 3 feet, and ending in a funnel to facilitate the entrance of the air, which will be cooled by passing through this subterraneous pipe on its road to the drying-room; an opening should be made in the floor of the drying-room, with a cover to fit on it, to close it when desired. Naturally, in order that the air may circulate, the upper ventilator must be open to attract the cool air. In case of a large drying-room, two of these air-tubes should be made.

#### BODY AND TEXTURE OF CHEESE.

The market requires a firm cheese, neither hard nor soft, a cheese with a good body, and, in texture, pleasant and oily.

To get such a cheese, the milk must be sound enough to allow time enough for the proper performance of the following operations:

1. To coagulate the milk firmly enough, with good rennet, in from 25 to 50 minutes, according to the season; *i. e.*, the duration of the coagulation ought to increase as the season advances.

2. To cut and heat up the curd in 40 to 55 minutes. The curd should be cut the finer in proportion as the acidity tends to develop itself the more rapidly, or as the curd is subject to retain more moisture, which happens in autumn on account of the greater richness of the milk.

3. To stir the curd constantly with the small rake, after heating up, until it is certain that it will be very firm when it is time to draw off the whey. General rule: it is better, after heating-up, to retain only just so much whey in the vat as will enable the curd to be stirred.

4. If the curd is very firm, all the whey must be drawn off, when the hot-iron test gives threads, fine and numerous, of from  $\frac{1}{8}$  to  $\frac{3}{8}$  of an inch, according to the season and the different local situations. But, if acidity is developed before the curd is firm, the whey should be drawn off before the threads are so long.

5. During and after the running off of the whey, to stir the more briskly in proportion to the softness of the curd, to firm it before piling, and to get rid of the surplus moisture. In hot weather, even with goodish milk, it is sometimes difficult for one man alone to get his curd firm enough before piling at the sides of the vat; in this case, I would advise him not to break the curd, after the whey has run off, but

to pile it in little and to first cutting too roughly

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to pile it in order to put it through the mill as soon as it is firm enough, to stir it a little and to pile it up anew, to cut it as usual when the proper time arrives. This first cutting will have the effect of expelling the moisture without breaking the curd too roughly.

6. If gas (eyes) is found in the curd, more acidity must be made to develop itself; first, by retarding the running off of the whey, and retaining more moisture in the curd before piling, so as to drive off the gas by the acid; this gas generally retards the arrival of acidity, which is the reason why gassy milk gives a firm curd—too firm sometimes.

7. To cut the lumps coarser and pile them the higher in proportion to the smallness of the amount of moisture in the curd, or the greater of the number of eyes in it, in order to allow of the development of the acidity in a reasonable time, at the proper temperature, viz. 96°. The lumps must be turned over at least every half-hour, and piled higher and higher according to the amount of humidity to be retained. Care must be taken to cut off the ends of the lumps and put them into the middle of the mass, so that the whole may work equally together.

8. To grind the curd as soon as it becomes elastic, and has the smell of butter that is turning rancid; if there are eyes in it, you must wait till they vanish. In hot weather, you must not wait till this elasticity and smell are too pronounced, lest there should be a loss of butter-fat. For the same reason, the temperature, just before grinding, must be lowered to 92° or 90°, according to the out-door temperature.

9. To salt the curd at the rate of 1½ to 3½ lbs., according to the season and to the condition of the curd, when the surface of the pieces is glossy. If eyes still remain, wait till they disappear, stirring the curd gently from time to time, to prevent the mass from becoming too compact.

10. To put into mould when the salt is nearly melted, *i. e.*, in 20 or 30 minutes after salting. Great care must be taken to put as nearly as possible the same quantity into each mould, that the cheeses may be of equal size; press the curd well at the sides that there be no *vacua* in the bandages (*cotons*), and see that they go down into the mould with the curd.

11. To cover the curd with a cloth, dipped in hot water, to press lightly at first, gradually increasing the pressure for at least an hour, before turning under the bandages, which should be well tightened, so as not to get into folds (*not to corrugate*) on the sides of the cheese, and be cut, so as not to cover the cheese by more than 1½ inch.

12. To replace the cheese under the press for at least 20 hours, and to attend as much as possible to the pressure, which should be more and more severe.

13. Unless your press be perfect, you will very often, the next morning, not only have to turn the moulds upside down, but to reverse the ends of the cheese in the mould, to attain uniformity of pressure, that the cheese be more upright and its surface be equal at the top and bottom. The cheese is to be returned to the press until that implement is required for the next day's make.

If, after all this, the cheese is kept in a drying-room whose temperature can be preserved at 65° to 75°, I am persuaded that it will have the body and texture required.

#### COLOUR.

If either coloured or white cheese is made, the shade must be decided, clear and uniform. Frequently, even in white cheese, there are spots paler than the rest, and for the following reasons :

1. Using bad knives, which cut the curd into too large pieces, where too much moisture remains, and where, in consequence, acidity, being more developed than elsewhere, produces pale spots.

2. Insufficient stirring of the curd, either during or after the heating-up, which allows it to take in little balls, and has the same effect as the using of bad knives.

3. Irregularity and delay in turning the curd, when in lumps, which makes the parts most exposed to the air become much more yellow than the rest.

4. Mixing yesterday's curd with to-day's. It is better, supposing there are no small moulds, to press the remainder curd into a large mould, which is to be filled up with fresh curd the next day, and again put to press ; or, if curd has been kept unpressed, to put the whole, either at the top or the bottom of a mould, so that in probing the cheese with the taster, the colour may appear to be uniform.

As to coloured cheese, the causes of its want of uniformity of colour, besides those mentioned as affecting white cheese, are using bad colouring matter, or want of care in making its dilution so as to mix well with the milk.

From what I have just said, it is clear that if the cheese has too much acidity, the colour will be too pale, though perhaps uniform, whether the cheese be white or coloured.

Unless the market requires, positively, coloured cheese, make yours white ; for there is less risk and it is cheaper. Many makers succeed well in making white who fail in coloured cheese. For the majority, they had better spend the money the colour cost in things more useful to the factory.

#### APPEARANCE OF THE CHEESE.

With cheese as with anything else : if it pleases the eye, a great point is gained in its favour. Still, much of our cheese has, in this respect, the following defects :

1. The cheeses are not of equal height. This fault occurs most frequently in the small factories, which, receiving but little milk, are often in trouble, unless they have a small press for the remainder curd.

The weight of a cheese 15 inches high, in a horizontal press, should be from 65 to 70 lbs.

2. A cheese lop-sided, either by a real defect in the process, or from carelessness on the maker's part. The cure is indicated above.

3. A cheese having been made of new cheeses making itself moisture has

4. A cheese the surface as produce the surface after leaving cheese at all ; those that are not adhere to

I have seen to the cheese wash them clean

5. Dirty hands of him

6. Cheese the bandages. especially in hands from the body gives a soft curd, the surface to firm it sufficient. The excess of acidity expels the butter but expels its butter a much greater after grinding, especially as it

7. Bad packaging economy than is not even cut down

Lastly, I must address to all the proprietors, makers must be told of my duty in pointing themselves guilty men of good intentions

The success of us not to slacken

3. A cheese with cracked sides. This often depends upon the bandages not having been sufficiently tightened when turned under. Another reason is the exposure of new cheese to a too strong current of air. Lastly, this fault may arise from the making itself; if there has been too much stirring of the curd, so that not sufficient moisture has been left in it, the cheese will be dry and liable to crack.

4. A cheese cracked on its surface. Besides the two last causes, which may affect the surface as well as the sides of the cheese, there are two other causes which may produce the same effect: the former is that the cheese was not greased soon enough after leaving the mould, even if it is the custom in the particular factory to grease cheese at all; the latter is, when bandages are used instead of greasing, the use of those that are not perfectly clean; if the bandages are in the least greasy, they will not adhere to the cheese, and in that case it will crack.

I have seen at a factory the same bandages used for six years, and they stuck to the cheese just as if they were being used for the first time; *i. e.*, it is easy to wash them clean after each sale of cheese.

5. Dirty bandages round the cheese, so foul sometimes that the print of the hands of him who put them on the cheese was clearly visible.

6. Cheese that allows butter to be seen in the trying-hole (*sonde*) and through the bandages. This fault is very common with milk more than three milkings old, especially in hot weather, for in stale milk the cream is generally more separated from the body of the milk, and, during the heats, the milk, being often too ripe, gives a soft curd which offers no resistance to the escape of the butter. With such a curd, the stirring, after the running-off of the whey, must be done so severely, to firm it sufficiently, that the pellicle that envelops each cube of curd is broken. The excess of acidity in the curd, either when still in the whey, or when in lumps, expels the butter fat. That is how we know that gassy milk gives a cheese that expels its butter, for it must be allowed to develop more acidity in order to prevent a much greater defect—that of eyes in the cheese. Too much stirring of the curd, after grinding, as well as too high a temperature in the curd while in lumps, but especially as it is grinding, will also cause loss of butter.

7. Bad packing of cheese, in badly-made boxes, fragile or dirty. No worse economy than sending cheese to market in inferior boxes, which but too often are not even cut-down to the level of the top of the cheese they contain.

Lastly, I may say that I would much rather have had only congratulations to address to all those practically engaged in dairying in Quebec, whether factory proprietors, makers or patrons, instead of having to find fault as above. But, as people must be told of their faults if they are to correct them, I thought I was but doing my duty in pointing out our faults in dairying, in order that those who feel themselves guilty may quickly correct themselves, if they wish to be reckoned among men of good intentions, men desirous of improvement.

The success we lately met with at the Chicago Fair is calculated to encourage us not to slacken in the movement we have initiated during the last few years in the



path of the dairy industry, but to redouble our endeavours to increase our reputation as producers of *Cheddar*, if we desire to retain the English market, which can dispose of a much greater quantity of cheese than we send thither to-day, but only on condition that our goods shall be of the best quality.

There is no reason why we should not be perfect masters of the art of cheese-making; the rich milk yielded by our cows gives us the best raw material; it is our business to make the best use of it.

Let the proprietors make it their business to have the best built buildings and fittings-up; such as are to be found, thank God! at some factories in the Province. Let the makers learn to improve their work at the Dairy-School at St. Hyacinthe. Let the patrons hearken to and put into practice the instructions given them by the skilled lecturers sent about by Government to diffuse a knowledge of farming, especially as connected with the production of milk of the best quality and at the lowest possible cost. Let them, too, take the greatest possible care of the milk they deliver at the factories; this is more important than the mass of farmers believe nowadays: milk badly cared for, badly strained, badly aerated, is one of the greatest evils of our dairying.

And, lastly, let all our factories belong to the syndicates, and then before long we shall have attained the desired end—the obtaining for the Province of Quebec an immense and prolific source of wealth.

Respectfully submitted.

SAUL COTÉ,  
Inspector-General of Syndicates.

## REPORT OF MR. H. S. FOSTER,

ON THE CHEESE OF THE PROVINCE OF QUEBEC SENT TO THE CHICAGO FAIR AND TO THE INDUSTRIAL EXHIBITION AT TORONTO.

KNOWLTON, Que., Nov. 30th, 1893.

*To the President of the Dairyman's Association of the Province of Quebec.*

MR. PRESIDENT,

I have the honour to submit a brief report on the steps which I took to assist in preparing an exhibit of cheese and butter from the Province of Quebec, at the World's Columbian Exposition at Chicago and the Industrial Exposition at Toronto, Ont.

I was invited by the Dominion Dairy Commissioner to assist in securing exhibits of cheese and butter from Quebec for the World's Fair, in accordance with the plan of the Bulletin ("Dairy Products for the World's Columbian Exposition"), issued from his office at Ottawa.

I was also requested at the World's Fair

I announced which the exhibits take part.

A large number at Montreal in the in the same way in 1893.

It affords me great and butter from the

The official and yet been furnished list of exhibitors taken as correct for

Each exhibit The score cards set under the proper heading

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It was possible

The judges appointed John H. Hodgson, one of the highest judges of the highest all exhibits of cheese medal and diploma.

Points scored by

A. T. Newton, Abercorn  
Andrew Fossy, Granbo  
C. A. Beattie (No. 1) Iron Hill  
Nap. Desfosses (No. 1) Iron Hill  
Nap. Desfosses, Nicolet,  
J. N. Daguay, La Baie  
C. A. Beattie, Iron Hill  
R. Wherry (Mountain Park)  
Mrs. A. Macfarlane, St. Hubert  
S. Duhamel, Pigeon Hill  
C. D. Jewell, Sweet'sburg

I was also requested by the Executive Commissioner for the Province of Quebec at the World's Fair to render assistance in that work.

I announced through a circular letter to the newspapers the conditions under which the exhibits would be received, and urged the dairymen of the province to take part.

A large number of exhibits of cheese were forwarded to the Dairy Commissioner at Montreal in the Fall of 1892; and several lots of cheese and butter were sent in the same way in May, 1893, to be placed with the exhibits at Chicago in June, 1893.

It affords me great pleasure and satisfaction to be able to report that the cheese and butter from the Province of Quebec took a high place at that competition.

The official announcement of the awards by the World's Fair authorities has not yet been furnished to me; but I am informed, on good authority, that the following list of exhibitors and exhibits from Quebec, that won awards of medals, may be taken as correct for the June competition.

Each exhibit of cheese and butter was judged according to a score of points. The score cards set forth an analysis of the excellencies of the different exhibits under the proper headings. Those used for cheese were:

Flavor.....	45
Texture and body.....	30
Color.....	15
Finish.....	10

It was possible for a perfect exhibit to receive 100 points.

The judges appointed by the Exposition Committee on awards were Messrs. John H. Hodgson, of New York, and A. F. McLaren, of Windsor, Ont. Both are judges of the highest reputation on this continent. They agreed to recommend that all exhibits of cheese which received a score of 90 and over should be awarded a medal and diploma.

NAMES OF SUCCESSFUL EXHIBITORS.

Points scored by exhibitors at World's Fair, Chicago, June, 1893:

<i>Points.</i>	<i>Points.</i>
A. T. Newton, Abercorn, Que..... 97	Mrs. Nazaire Vidal, Warwick, Que..... 94
Andrew Fossy, Granboro', Que..... 96	Edmund Duplaise, St. Pie de Guire, Que. 94
C. A. Beattie (No. 1) Iron Hill, Que..... 96	D. F. Sweet, Sweetsburg, Que..... 94
Nap. Desfosses (No. 1) Nicolet, Que..... 96	W. A. Perkins, East Dunham, Que..... 94
Nap. Desfosses, Nicolet, Que..... 95	Ger. St. Pierre, East Arthabaska, Que... 94
J. N. Daguay, La Baie du Febvre, Que .. 95	R. Wherry, Knowlton, Que..... 94
C. A. Beattie, Iron Hill, Que..... 95	R. J. Tillson, Haseville, Que..... 94
R. Wherry (Mountain Pass) Knowlton, Que 95	W. A. Wells, Sutton, Que..... 94
Mrs. A. Macfarlane, Sutton Junc., Que... 95	W. Parent, St. Elphege, Que..... 94
S. Duhamel, Pigeon Hill, Que..... 95	H. O. Wales, Sutton Junction, Que..... 94
C. D. Jewell, Sweetsburg, Que..... 95	Mrs. A. Macfarlane, Sutton Junc., Que.. 94

<i>Points.</i>	<i>Points.</i>
Mrs. A. Newton, Abercorn, Que..... 94	D. O. Bourbeau, Victoriaville, Que..... 92
R. Wherry (No. 2), Knowlton, Que..... 94	W. A. Perkins, East Dunham, Que..... 92
J. N. Duguay (No. 3), La Baie du Febvres Que..... 94	Mrs. C. D. Jewell, Sweetsburg, Que..... 92
Mrs. M. J. Tracy, Mansonville, Que..... 93	A. Crittenden, West Brome, Que..... 92
R. J. Tilson, Hazeville, Que..... 93	Alfred Trudel, St. Prosper, Que..... 92
Mrs. C. L. Jewell, Sweetsburg, Que..... 93	T. McKee, Sutton, Junction, Que..... 91
C. D. Jewell, Sweetsburg, Que..... 93	W. Parent, St. Elphege, Que..... 91
George Miller, West Brome, Que..... 93	J. N. Duguay (No. 1), La Baie du Febvre, Que..... 91
Arthur Macfarlane, Cowansville, Que..... 93	R. Wherry, Knowlton, Que..... 91
R. Morrison, Knowlton, Que..... 93	J. W. Benjamin, West Brome, Que..... 91
C. A. Beattie (No. 1), Iron Hill, Que..... 93	Gabriel Hamel, Cap Sante, Que..... 91
A. Macfarlane, Sutton Junction, Que..... 93	C. A. Beattie, Abercorn, Que..... 91
D. O. Bourbeau, Victoriaville, Que..... 93	J. A. Howe (Vale Perkins), Millington, Que..... 91
Edmund Duplaisse, St. Pie de Guire, Que. 92	J. L. & H. S. Gilbert, Dunham Que..... 90
W. S. Purdy, Savage's Mills, Que..... 92	

Quebec.—Brome county, 26 exhibits; Missisquoi county, 9 exhibits; Yamaska county, 7 exhibits; Arthabaska county, 4 exhibits; Shefford county, 2 exhibits; Nicolet county, 2 exhibits; Cnamplain county, 1 exhibit; Portneuf county, 1 exhibit. Total, 52.

\* In the month of August, I was authorised by the Board of the Dairy Association to assist in collecting and forwarding exhibits of cheese to the Industrial Exposition at Toronto. It had been agreed by the Association to subscribe the sum of one hundred dollars to the prize list at Toronto.

The cheese makers were assisted in making selections of cheese, to be sent to Toronto, by the instructors and inspectors of the syndicates. Altogether 276 boxes of cheese were forwarded by exhibitors; of these, 9 boxes arrived at Montreal too late; and 267 boxes were forwarded to Toronto.

I spent some time in Montreal looking after the exhibits; and afterwards went to Toronto in order to see the exhibits properly placed there. I was disappointed in finding the accommodation at the Fair Grounds altogether inadequate for the quantity of cheese offered for exhibition. The directors, manager and officials of the Industrial Exposition received me, as your representative, with cordiality. The original plan provided for the judging of the cheese by three judges,—one from Ontario, one from Quebec, and one from the United States. The gentleman who was invited to act as judge from the Province of Quebec, failed to attend; and it was agreed to leave the judging in the hands of the judge from the United States, viz: Mr. Robert McAdam, Rome, N. Y. About 800 boxes of cheese were on exhibition; and I cannot refrain from reporting that in my opinion it is a matter to be regretted that two judges—one each from the Province of Ontario and Quebec—were not present to act.

The Exhibit of Mr. C. E. Standish, Warden, Que., won fifth prize in class 70, which was open to all competitors;

The Exhibit of class 70½, which was and Ontario.

A statement of exhibits is attached showing shrinkage in weight per box of cheese.

I would recommend the sum to the prize list to be accommodated for

Immediately after I devoted myself to and butter for the V

The management under the control of will be published in list which has been of Quebec who won

The cheese of 1

J. Lemire, La Baie du  
A. McFarlane, Sutton J  
C. A. Beattie, Sutton M  
Mrs. M. J. Tracey, Mill  
J. N. Duguay, Blue Star  
Andre Fossey, Grandbo  
Jos. Moineau, St. Patri  
T. W. McKee, Sutton J  
Napoléon Desfosses, Bl  
Zephraïn Genest, St. P  
S. Duhamel, Pigeon Hill  
R. Wherry, Knowlton.  
C. A. Beattie, Iron Hill  
Wm. Parent, Blue Star  
M. Robert, Milton East  
Ed. Duplaisse, Blue Star  
C. A. Beattie, Sutton...  
Mrs. A. Newton, Sutton  
R. R. Tillson, Haseville.  
Germain St. Pierre, E. J  
Miller & Crittenden, W.  
D. F. Sweet, Sweetsburg



The Exhibit of Mr. W. A. Martindale, Cowansville, Que., won fourth prize in class 70½, which was open to the members of the Dairymen's Associations of Quebec and Ontario.

A statement of the expenses which were incurred in connection with those exhibits is attached hereto. The total expenses, including freight charges, cartage, shrinkage in weight, railways fares, etc., amounted to \$196.96 or less than 75 cents per box of cheese exhibited.

I would recommend that if the Association proposes hereafter to contribute any sum to the prize list at the Toronto Fair, it be stipulated as a condition, that suitable accommodation for the display of the cheese be provided.

Immediately after the work connected with the Exhibits at Toronto was finished I devoted myself to help on the work of providing a representative display of cheese and butter for the World's Fair at the final competition in October.

The management of the dairy exhibits from the whole of Canada was directly under the control of the Dominion Dairy Commissioner, and doubtless full particulars will be published in his report. In the meantime, I desire to submit the following list which has been given as that of the names of the exhibitor's from the Province of Quebec who won awards on the October competition.

The cheese of 1892 which scored 90 points and over, are entitled to awards.

CHEESE OF 1892.—QUEBEC.

	<i>Points.</i>
J. Lemire, La Baie du Febvre.....	97
A. McFarlane, Sutton Junction.....	96½
C. A. Beattie, Sutton Mountain.....	96½
Mrs. M. J. Tracey, Millington.....	96½
J. N. Duguay, Blue Star No. 3.....	96
Andre Fossey, Grandboro.....	96
Jos. Moineau, St. Patrick's Hill.....	96
T. W. McKee, Sutton Junc.....	96
Napoléon Desfosses, Blue Star No. 25... ..	96
Zephraïn Genest, St. Patrick's Hill.....	96
S. Duhamel, Pigeon Hill.....	96
R. Wherry, Knowlton.....	96
C. A. Beattie, Iron Hill.....	96
Wm. Parent, Blue Star No. 20.....	95½
M. Robert, Milton East.....	95½
Ed. Duplaisse, Blue Star, No. 21.....	95½
C. A. Beattie, Sutton.....	95½
Mrs. A. Newton, Sutton.....	95
R. R. Tillson, Haseville.....	95
Germain St. Pierre, E. Arthabaska.....	95
Miller & Crittenden, W. Brome.....	95
D. F. Sweet, Sweetsburg.....	95

	<i>Points.</i>
J. W. Cummings, Anson.....	95
R. Wherry, Mountain Pass.....	95
Mrs. A. MacFarlane, Sutton Junction... ..	95
M. Fleurant, St. Patrick's Hill.....	94½
H. O. Wales, East Dunham.....	94½
J. N. Duguay, Blue Star No. 3.....	94
S. J. Ingalls, Dunboro.....	94
A. T. Newton, Sutton.....	94
Wm. Parent, Blue Star No. 20.....	94
George Boland, St. Ursule.....	94
C. D. Jewell, Sweetsburg.....	93½
W. A. Wells, Sutton.....	93½
Napoléon Desfosses, Nicolet.....	93
D. O. Bourbeau, Victoriaville.....	93
Germain St. Pierre, E. Arthabaska.....	93
J. N. Duguay, Blue Star, No. 1.....	92
Zephraïn Genest, St. Patrick's Hill.....	92
Mrs. N. Vidal, Warwick.....	90
Wm. Perkins, B. Dunham.....	90
Mrs. J. A. Howie, Vale Perkins.....	89½
J. N. Duguay, Blue Star No. 1.....	86½
Wm. S. Purdy, Savage's Mills.....	82

*Points.*  
 iaville, Que..... 92  
 unham, Que..... 92  
 tsburg, Que..... 92  
 rome, Que..... 92  
 per, Que..... 92  
 tion, Que..... 91  
 , Que..... 91  
 La Baie du Febvre,  
 ..... 91  
 Que..... 91  
 Brome, Que. .... 91  
 nte, Que..... 91  
 i, Que..... 91  
 (kils), Millington,  
 ..... 91  
 anham Que..... 90  
 exhibits; Yamaska  
 unty, 2 exhibits;  
 euf county, 1 ex-  
  
 e Dairy Associa-  
 Industrial Expo-  
 scribe the sum of  
  
 ase, to be sent to  
 ogether 276 boxes  
 Montreal too late;  
  
 afterwards went  
 was disappointed  
 inadequate for the  
 r and officials of  
 cordiality. The  
 judges,—one from  
 e gentleman who  
 o attend; and it  
 he United States,  
 e were on exhibi-  
 s a matter to be  
 io and Quebec—  
  
 prize in class 70,

## CHEESE OF 1893—CHEDDAR.

## QUEBEC.

The cheese of 1893 which scored 95 points and over were awarded medals.

	<i>Points.</i>
J. H. Lefebvre, La Baie du Febvre.....	99½
Cyril St. Laurent, St. Valerie de Bul- stode.....	99½
Germain St. Pierre, Victoriaville.....	99½
I. S. Taylor, Moore's Str.....	99½
J. D. Barrington, St. Martine... ..	99
E. G. Welch, Farnham.....	99
Thos. Durnan, Landerville.....	99
Eugene Normand, St. Gilbert.....	99
Sarah Newton, Sutton Flat.....	99
Rufus Blunt, Foster.....	99
Mary Lerosé, Sutton Flat.....	99
Mrs. Rufus Blunt, Foster.....	99
I. N. Duguay, Blue Star, No. 6.....	99
Amide Plante, St. Ours.....	99
A. W. Woodward, Sutton Flat.....	98½
Chas. Newton, Sutton Flat.....	98½
Mrs. Wm. McFarlane, W. Brome.....	98½
Alfred Trudel, St. Prosper.....	98½
H. P. Sweet, W. Brome.....	98½
John Savard, St. Alban.....	98½
A. T. Newton, Sutton Flat.....	98½
J. A. Plamondon, Ste. Anne de la Parade	98½
Mary Larose, Sutton Flat.....	98
Mrs. E. G. Welch, Farnham.....	98
T. L. Burnett, Farnham Centre.....	98
W. H. Walker, Huntingdon.....	98
J. G. Wales, E. Dunham.....	98
Josepe N. Gandreau, Magog... ..	98
Charles Wilkins, Mansonville Str.....	98
Robert Wherry, Mountain Pass.....	98
Sarah Newton, Sutton.....	97½
C. M. Harvey, Venice.....	97½
S. Duhamel, Pigeon Hill.....	97½
Geo. McCrum, Iron Hill.....	97½
W. T. Gardiner, St. Louis Str.....	97½
Ed. Duplaisse, St. Pie de Guerre.....	97½
A. Brissette, Stanfold.....	97½
Elie Proulx, La Baie du Febvre.....	97½
Mrs. E. G. Welch, Farnham.....	97½
E. G. Welch, Yamaska.....	97½
H. P. Sutton, W. Brome.....	97

	<i>Points.</i>
Walter Parenteau, Blue Star, No. 29, St. Pie de Guire.....	97
W. J. Sheldon, Brome Corners.....	97
A. S. Lloyd, Ormstown.....	97
A. Gerin, St. Elwidge.....	97
Mrs. K. L. Perkins, E. Dunham.....	97
John A. Macdonald, Athelstan.....	97
C. A. Beattie, Iron Hill.....	97
C. W. Willey, Abercorn.....	97
Mrs. A. McFarlane, Cowansville.....	96½
Thos. H. Noyes, Sweetsburg.....	96½
S. Duhamel, Pigeon Hill.....	95½
Mrs. M. J. Tracey, Millington.....	96½
Didier Demers, St. Zephrain.....	96½
Wm. Parent St. Elphege.....	96½
Mrs. E. M. Carter, Cowansville.....	96½
N. E. Clement, Sse. Anne de la Parade.	96½
J. A. Macdonald, Athelstan.....	96
R. Wherry, Knowlton.....	96
Howard W. Perkins, E. Dunham.....	96
Addie Peacock, Sweetsburg.....	96
A. Macfarlane, Cowansville.....	96
A. C. Carter, Cowansville.....	96
D. O. Bourbeau, Victoriaville.....	96
J. N. Duguay, La Baie du Febvres.....	96
Omer Parent, St. Zephrin.....	96
Elmer A. Russell, Stanbridge E.....	96
H. O. Wales, Sutton Junction.....	96
Arthur Crittenden, W. Brome.....	96
Mrs. N. Vidal, Warwick.....	96
Louis Gilbert, St. Ferdinand d'Hâlifax..	95½
Onesime Lafond, Yamaska E.....	95½
Elmer A. Russell, Stanbridge E.....	95
Abel Whitehead, Robinson Bury.....	95
Elie Boivin, St. Thomas du Pierreville..	95
W. H. Tillson, W. Farnham.....	95
J. D. Morrison, E. Hatley.....	94½
Emile Dion, N. Stukely.....	94½
W. A. Perkins, E. Dunham.....	94
Mrs. Kate L. Perkins, E. Dunham.....	92½
J. Hawke, N. Stanbridge.....	88½
J. D. Leclair, St. Hyacinthe.....	93½

H. Lefebvre, St. Zeph  
A. Macfarlane, Cowa  
N. Vidal, Warwick..  
Mahon Toof, Sweetsl  
Mrs. A. Macfarlane, (C  
A. T. Newton, Sutton  
Miss Nellie Etterban  
Arthur Crittenden, W  
Louis Gilbert, St. Fer  
W. J. Sheldon, Brome  
Wm. Macfarlane, W.  
J. W. Wales, E. Dunh  
Narcisse Parenteau, St.

W. H. Tillson, W. Far  
J. G. Wales, E. Dunha  
W. H. Tillson, W. Far

Taking the resu  
exhibits of the chee  
of 1893 won medal  
enough to entitle the  
were demonstrated t  
49 lots exhibited, s  
October, 1893.

In the October c  
possible score of 100

In the competit  
relatively high positi

Early in the seas  
should not be made t  
were Messrs. Mansfie  
scoring card used was

Flavor.  
Grain...  
Color...  
Salting  
Packing

CHEESE OF 1893—CHEDDAR.—QUEBEC.—Continued.

	<i>Points.</i>		<i>Points.</i>
H. Lefebvre, St. Zephirin.....	99	A. W. Woodward, Sutton Flat.....	96½
A. Macfarlane, Cowansville.....	99	Achile Belisle, La Baie du Febvre.....	96½
N. Vidal, Warwick.....	99	Eugene Rivard, St. Casimer.....	96
Mahlon Toof, Sweetsburg.....	98½	J. B. Strong, Sutton Flat.....	96
Mrs. A. Macfarlane, Cowansville.....	98½	Emele Hamelin, Grondines.....	95½
A. T. Newton, Sutton Flat.....	98½	Mrs. Jarad Hawke, E. Stanbridge.....	95½
Miss Nellie Etterbanks, Knowiton....	98	Joseph Felix, Champlain.....	95½
Arthur Crittenden, W. Brome.....	98	Alf. Trudel, St. Ubalde.....	95
Louis Gilbert, St. Ferdinand d'Halifax..	97	Ameud Allie, St. Thomas du Pierreville..	95
W. J. Sheldon, Brome Corners.....	97	Charles Newton, Sutton Flat.....	95
Wm. Macfarlane, W. Brome.....	97	Alfred Trudel & Co., St. Ubalde.....	95
J. W. Wales, E. Dunham.....	97	H. A. Livingston, St. Hyacinthe.....	94
Narcisse Parenteau, St. Michael Yamaska	97	Joseph Veroneau, Valcour-Ely.....	92½

CHEESE OF 1893—FLATS AND YOUNG AMERICAS.

QUEBEC.

	<i>Points.</i>		<i>Points.</i>
W. H. Tilsen, W. Farnham.....	99½	Ernest Russell, N. Stanbridge.....	97
J. G. Wales, E. Dunham.....	98	S. Duhamel, Pigeon Hill.....	96½
W. H. Tilsen, W. Farnham.....	98		

Taking the results of the two competitions (June and October) together, 78 exhibits of the cheese made in 1892 won medals, and 131 exhibits of the cheese of 1893 won medals. In all 209 exhibits of cheese from Quebec scored high enough to entitle them to medals. The excellent keeping qualities of our cheese were demonstrated by the fact that 45 exhibits of cheese made in 1892, out of some 49 lots exhibited, scored high enough to entitle them to medals when judged in October, 1893.

In the October competition, four lots of Quebec cheese scored 99½ points out of a possible score of 100 points for perfection. No exhibits scored higher than these.

In the competitions in the classes for butter, the exhibits from Quebec won a relatively high position.

Early in the season it was decided that the main exhibit of butter from Canada should not be made until October. The judges of butter in the June competition were Messrs. Mansfield, of Wisconsin, and John S. Pearce, of London, Ont. The scoring card used was:

Flavor.....	45
Grain.....	25
Color.....	15
Salting.....	10
Packing.....	5
	100



The standard of points to entitle to a medal was fixed at 97 and over for butter. Notwithstanding the few lots which were sent from Canada, (25 exhibits in all) 13 medals were won with butter. Eleven of these went to the province of Quebec, mostly to the county of Brome, where they were collected by H. S. Foster, President of the District of Bedford Dairymen's Association.

The following is the record of points scored by Canadian exhibitors of butter at the World's Fair, Chicago :

J. D. Leclair, Ste. Thérèse de Blainville, Que .....	99
L. R. Whitman, Knowlton, Que.....	99
H. Chamberlain, West Bolton, Que.....	99
J. D. Leclair, St. Hyacinthe, Que.....	98
N. P. Emerson, Sutton Junction, Que.....	98
F. L. Burnett, Farnham Centre, Que.....	98
J. D. Leclair, Ste. Thérèse de Blainville, Que.....	97
N. P. Emerson, Sutton Junction, Que.....	97
T. L. Burnett, Farnham Centre, Que.....	97
W. P. Hillhouse, Knowlton, Que.....	97

For the competition in butter in October, a large number of exhibits were sent from this province. It was admitted that the judging was very strict on quality and that the minimum score of points to entitle to an award of a medal was high.

The following is a list of the successful exhibitors with the points scored :

#### QUEBEC.

Minimum points required to entitle to an award:—95 in class IV., 94 in class V, and 93 in classes I, II, and III.

#### CLASS IV.—SEPARATOR CREAM.

A. W. Atkinson, Piedmont, Que.....	96½ points.
Alphonse Furvoy, St. Michael, Quebec.....	96 "
N. E. Bernatchez, Montmagny, Que.....	96 "
Z. S. Lawrence, W. Shefford, Que.....	96 "
Frank Wilson, Montreal, Que.....	95 "
East View Stock Farm, Cookshire, Que.....	95 "
A. Chicoine, St. Marc, Que.....	55 "

#### CLASS III.—PRINTS AND FANCY PACKAGES.

Mrs. M. N. Emerson, Sutton Junction, Que.....	94 "
N. P. Emerson, Sutton Junction, Que.....	94 "

#### CLASS II.—DAIRY BUTTER MADE ON THE FARM FROM A HERD OF ONE BREED.

Walter Taylor, Cookshire, Que.....	94 points.
------------------------------------	------------

#### CLASS I.—DAIRY

John L.  
John L.  
G. W.  
Mellevi  
Henry  
Wm. Bi

I have taken  
benefits resulting  
World's Fair, and  
of cheese and butte

From the follo  
in value in Canadi  
the World's Fair.

*Prof. J. W. Roberts*

DEAR SIR,—W

1st. What do y  
result of the succes  
month of June ?

2nd. What, in  
the cheese output of  
An early reply

*Hon. John McIntosh  
Chicago.*

DEAR SIR,—In  
the interest which ha  
vince of Quebec, owi  
tion of Canadian che  
quality of the output

A moderate estin  
stimulated attention  
Quebec, at from one-q  
Quebec. The estimat  
of the present season,

CLASS I.—DAIRY BUTTER MADE ON THE FARM FROM MIXED HERD.

John L. Emerson, Sutton Junction, Que.....	95	points.
John Dougall, Cowansville, Que.....	94	"
G. W. L. French, Island Brook, Que.....	94	"
Melleville Paterson, Knowlton, Que... ..	93½	"
Henry Miller, Knowlton, Que.....	93½	"
Wm. Birch, Coaticook, Que.....	93½	"

I have taken the following extracts from a Canadian newspaper as showing the benefits resulting to Quebec from the part which her dairymen have taken in the World's Fair, and as presenting the undoubted success which attended the exhibits of cheese and butter from Canada as a whole.

From the following correspondence it will be seen that a considerable increase in value in Canadian cheese has resulted from the favourable reports given of it at the World's Fair.

*Prof. J. W. Robertson, Chicago.*

DEAR SIR,—Would you kindly favour me with replies to the following questions :

1st. What do you estimate to be the advance in the price of Quebec cheese as a result of the success of the Province of Quebec in the cheese competition during the month of June ?

2nd. What, in your opinion, is the aggregate gain in the Province of Quebec on the cheese output of the present season ?

An early reply will oblige.

Yours truly,

(Signed) JOHN McINTOSH, JR.

CHICAGO, 16th October, 1893.

*Hon. John McIntosh, Commissioner for Quebec to the World's Columbian Exposition, Chicago.*

DEAR SIR,—In reply to your questions, I would say that it is my opinion that the interest which has been awakened in the manufacture of fine cheese in the Province of Quebec, owing to and resulting from the success which attended the exhibition of Canadian cheese at Chicago in June, has resulted in an improvement in the quality of the output of the factories of that Province.

A moderate estimate would put the increase in the value of the cheese, from the stimulated attention devoted to this branch of the dairy industry in the Province of Quebec, at from one-quarter to one-half cent per pound on the cheese manufactured in Quebec. The estimate would represent a sum of over \$100,000 in money on the make of the present season, besides the gain in knowledge, reputation and experience.

Yours truly,

(Signed) JAS. W. ROBERTSON,  
Dairy Commissioner.

97 and over for butter.  
(25 exhibits in all) 13  
e province of Quebec,  
H. S. Foster, President

exhibitors of butter at

- ..... 99
- ..... 99
- ..... 99
- ..... 98
- ..... 98
- ..... 98
- ..... 97
- ..... 97
- ..... 97
- ..... 97

exhibits were sent  
ry strict on quality  
a medal was high.

points scored :

ss IV., 94 in class V,

- ..... 96½ points.
- ..... 96 "
- ..... 96 "
- ..... 96 "
- ..... 95 "
- ..... 95 "
- ..... 55 "
- ..... 94 "
- ..... 94 "

BREED.  
..... 94 points.

## CANADIAN CHEESE AT CHICAGO.

As fuller information comes to hand concerning the competition in cheese at the World's Fair, the more reason have Canadian dairymen to be satisfied and even jubilant over the results which have been won under the management of the Dominion Dairy Commissioner. The wisdom of the plan which was adopted to secure a thoroughly representative exhibit of cheese from all the provinces, has been amply justified by its success. The evident intention was to present a collection of cheese which would represent the output of the factories in every part of the Dominion where dairying upon the co-operative plan has been established. The word "Canadian," by which our cheese are known in the British markets, was the one which fittingly described the exhibit. While the several provinces received due credit for the number of awards which went to dairymen in them, the effectiveness of the result for creating a favorable impression among the farming classes of Europe and the cheese-eating public of Great Britain was heightened and conserved by the success won for "Canadian" and Canada.

A considerable gain to Canada will come through the favorable impression produced abroad by this victory, and the dairy farmers in the different parts of the Dominion will be encouraged and stimulated to pay more attention to a further development of this branch of farming for which our country seems to be specially adapted. Cheese-making in Ontario has been a foremost industry for several years, but the reputation of the cheese from the Province of Quebec was far behind that of its sister province; and until the organization of the dairying service under the Dominion Department of Agriculture, the cheese business in the Maritime Provinces was hardly commenced. Now, at the final competition at the World's Fair, the Province of Quebec has carried off, in the classes for Cheddar cheese, 143 awards against 45 for the whole of the United States, while the Maritime Provinces among them have taken no less than 15 awards out of 35 exhibits of Cheddar cheese. In Prince Edward Island, the cheese business is still almost wholly managed by the Dairy Commissioner, no less than 11 factories being in operation under his direct control. Nineteen exhibits were sent from these island factories, and they captured eight awards. When it is known that all the exhibits from Prince Edward Island, with the exception of two, were cheese of July make, which had not been kept in cold storage and afterwards came in competition in Chicago with the finest of August and September cheese, the success of the cheese from the Island Province—the Gem of the Gulf—is all the more astonishing and gratifying.

That the plan adopted by the Dairy Commissioner in making final selections of the cheese at Montreal and Ingersoll was a judicious one, is further demonstrated by the fact that less than 9 per cent of all the exhibits of cheese from Canada failed to carry off awards. The general excellence and superiority of the Canadian cheese was thus clearly established. The keeping qualities of Canadian cheese—one of the points of the greatest commercial value—was also brought out most impressively by 115

exhibits of cheeses and were described the finest lot of provided some cheese is a summary of

Total number of exhibits  
Of these Canadian

Nearly all of

Total awards for Canada  
Of these Canadian  
Leaving for the United States

Thirty-one exhibits  
States cheese.

Total number of exhibits  
factory classes...

Of these Canadian series  
Total awards for Canada  
Canada took all

Total awards for Cheddar  
Of these Canadian took  
Leaving for the United States

One hundred and  
higher than the highest

In Cheddar or other  
which Canada took

United States  
Canada...

The deep and general  
among farmers and business  
incidental tributes to  
pressive and successful  
Great Fair.

That the judging



exhibits of cheese of last year's make. Of these no less than 110 carried off awards, and were described by the judges (two United States experts and one Canadian) as the finest lot of cheese they ever examined. The Dairy Commissioners had also provided some cheeses of 1891, which were described as "faultless." The following is a summary of the results of the two competitions in which Canada took part:—

JUNE EXHIBITION OF CHEESE.

Total number of single entries of cheese from Canada and the United States..... 667  
 Of these Canada sent from over 100 different factories..... 162

Nearly all of these entries were in the classes for Cheddar or factory cheese.

Total awards for Cheddar cheese..... 138  
 Of these Canada took..... 129  
 Leaving for the United States..... 9

Thirty-one exhibits of Canadian cheese scored higher than the highest United States cheese.

OCTOBER EXHIBITION OF CHEESE.

Total number of single entries from Canada and United States in Cheddar or factory classes..... 606  
 Of these Canada sent..... 524  
 Total awards for cheese (made previous to 1893)..... 110  
 Canada took all of these.  
 Total awards for cheese in Cheddar or factory classes (made in 1893)..... 414  
 Of these Canada took..... 369  
 Leaving for the United States..... 45

One hundred and thirty exhibits of Canadian cheese in these classes scored higher than the highest United States cheese.

In Cheddar or factory classes for the two competitions of June and October, in which Canada took part, the awards are as under:—

	Number of Exhibits.	Awards.
United States.....	586	54
Canada.....	687	647

The deep and general interest which these striking successes have awakened among farmers and business men over the whole continent and in Great Britain are incidental tributes to the soundness of the decision to make only two imposing, impressive and successful exhibits, namely, at the opening and closing of the World's Great Fair.

That the judging was conducted in the fairest manner is evident, as the following

on in cheese at the satisfied and even management of the h was adopted to rovinces, has been ent a collection of very part of the established. The markets, was the nces received due the effectiveness of classes of Europe conserved by the orable impression ferent parts of the tion to a further ms to be specially for several years, far behind that of service under the aritime Provinces World's Fair, the heese, 143 awards Provinces among eddar cheese. In managed by the n under his direct actories, and they bits from Prince ke, which had not Chicago with the e from the Island atifying. al selections of the monstrated by the ada failed to carry n cheese was thus ne of the points of pressively by 115

extracts from a report of the meeting of the official representatives of dairying at the World's Fair, will show :

"A meeting of the official representatives of Dairying at the World's Columbia Exposition, from Iowa, Wisconsin, New York, Illinois, New Hampshire, Vermont, Nebraska, Connecticut, Minnesota and Canada was held on the Exhibition Grounds on Saturday, October 7, 1893.

"A deputation consisting of Messrs. Robertson, McKinstry, Ashburn, Gabrielson, Smith, Loomis, and Arms, was appointed to lay the following recommendations before the proper authorities:—

I.—"It is recommended in the judging of butter, that one person bore samples from the exhibits of butter and that a sample be given directly on a separate trier to every judge.

II.—"It is recommended that every judge record his own judgment on a separate score card without consultation, and that the final score of points on every exhibit be the average of the score of points given by the three judges; but, in case there should be a difference of five points or more between the scoring of two of the judges in any one division of the score card, there shall be another examination made on lines similar to those of the first examination.

III.—"It is recommended that the exhibitors be allowed a clerk to keep a record of the scores for the use of the representatives of dairying from the different States, and that the same clerk be named and paid by those representatives.

IV.—"It is recommended that the same rules that govern the judging of butter shall govern the judging of cheese; and further, that the several exhibits of cheese be presented to the judges in a room, or in such a way that the source (as to locality and the individual exhibitor) cannot be known to the judges.

V.—"It is recommended that three judges be appointed on cheese, viz., one judge from Canada, one judge from the district of the Eastern States, and one judge from the district of the Western States.

"These recommendations in the form of propositions, were adopted one by one, and unanimously, by the representatives of dairying at the World's Columbian Exposition from Iowa, Wisconsin, New York, Illinois, New Hampshire, Vermont, Nebraska, Connecticut, Minnesota, Indiana and Canada.

(Signed)

JAMES W. ROBERTSON,  
Chairman.

A. P. MCKINSTRY,  
Secretary."

"Confirmed :

For Iowa,—C. I. Gabrielson; for Wisconsin,—D. W. Curtiss; for New York,—G. L. Smith; for Illinois,—Lovejoy Johnson; for New Hampshire,—W. D. Baker;

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for Vermont,—H. M. Arms; for Nebraska,—D. P. Ashburn; for Minnesota,—A. P. McKinstry; for Indiana,—Laura D. Wooley; for Canada,—Jas. W. Robertson.

These recommendations were, as far as practicable, carried out, and the judging was done in such a way as to prevent any conscious or unconscious bias on the part of those who acted.

Most of the credit for the success of the exhibition is due to the cheese-makers and dairymen who took pains to provide such excellent quality in their exhibits, and who responded so generally and carefully to the appeal in the bulletin issued by Professor Robertson. Honor and praise are also due to the leading dairymen from Canada, who assisted the Dairy Commissioner in the task of seeing that Canada was fittingly represented in her dairy interest at Chicago. Among these were: Messrs. D. M. Macpherson, Lancaster, Ont., president of the Dominion Dairymen's Association; Wm. Eager, Morrisburg, Ont., ex-president of the Dairymen's Association of Eastern Ontario; Wm. Bissell, Algonquin, Ont., president of the Dairymen's Association of Eastern Ontario; D. Derbyshire, Brockville, Ont., president of the Ontario Creameries' Association; Col. O. P. Patten, Brome Corners, Que., who represented H. S. Foster, on behalf of the dairy interests of the Province of Quebec; John S. Pearce, London, Ont., a director in the Dairymen's Association of Western Ontario, and in the Ontario Creameries' Association. It was regretted that Mr. John Geary, London, Ont., president of the Dairymen's Association of Western Ontario, was unable to attend with the others. His colleague from the Board of the Dairymen's Association of Western Ontario, Mr. A. E. MacLaren, Windsor, Ont., was one of the judges, and in that capacity, by his expert knowledge, fairness, unflinching geniality and ability, he rendered service equally satisfactory and acceptable to the United States and Canadian dairymen. Mr. J. C. Chapais, St. Denis, Que., Assistant Dairy Commissioner, was also in attendance. Mr. J. de L. Taché, Quebec, who did much to secure exhibits of creamery butter from Quebec, was at Chicago earlier in the season. Mr. H. S. Foster, Knowlton, Que., President of the District of Bedford Dairymen's Association, who did the lion's share of the work in that Province in securing exhibits, was prevented by illness from going to Chicago. With such a bodyguard to assist from among the men to whom the dairymen of Canada owe most of the progress which has been made in dairying during the last ten years, it is no wonder that unqualified success crowned every part of the enterprise.

The immediate effect of this sweeping achievement at Chicago will be to still further enhance the reputation of our cheese in the British markets. It will also further stimulate our dairymen to pay more attention to the home-end of the business. The Dairy Commissioner has estimated that the resulting improvement in the quality of cheese throughout the whole Dominion will represent an increase in the value of not less than from  $\frac{1}{4}$  to  $\frac{1}{2}$  cent per pound. As the exports of cheese from Canada are now over 118 millions of pounds annually, the monetary value directly resulting from the success at Chicago will not be less than four or five

ROBERTSON,  
Chairman.

McKINSTRY,  
Secretary."

for New York,—  
—W. D. Balser;



hundred thousand dollars. To this is to be added the permanent benefits of the acquisition of knowledge, improvement in practice and gain in reputation.

The results from the butter competition, while not so gratifying to Canada, are still full of encouragement and use. The whole of the butter on exhibition was judged by three eminent experts (two from the United States and one from Canada). Canada won 27 awards. The body of the Canadian butter was on the whole rated very high; most of the exhibits lost several points on flavor. The circumstances of the exhibition were not favorable to Canadians by reason of the distant points from which most of the butter had to be sent (some lots came all the way from Manitoba on the one hand and from New Brunswick on the other). The defects in the flavor were mostly attributed to the use of inferior salt, or salt which had acquired foul flavors or odors by exposure to the odors from other commodities in the holds of vessels or in warehouses. This little matter was the great matter which ruled out 50 or more of our exhibits of butter which were excellent in every other respect. In future particular care must be given by our butter-makers to prevent the salt from being exposed in any foul atmosphere, as otherwise it is liable to acquire taints and transfer them to the butter. The lessons from the World's Columbian Exposition, when applied to our butter-making, will doubtless prove beneficial; and the Dairy Commissioner's claim, that we should be able to carry forward our cheese business to still wider extension and higher attainment, and at the same time bring up the reputation and quality of our butter abreast of it within five years, will be realized, only if the individual dairymen give their hearty co-operation and follow out carefully the instructions which are given.

Another feature of the dairy exhibit which merits reference is the service which has been rendered to Canada by the Big Cheese. As an advertising means it has, perhaps, been one of the best hits of the year. It has been paragraphed and commented upon by at least two-thirds of the newspapers of this country and Europe, and has brought the dairying business of Canada into a prominence which has a commercial and immigration-aiding value. Rumors have been set going that the Big Cheese would "spoil," that it "would be ruined by the heat," that it "would walk away," that it "would be strong as horse hide," and that it would commit half a hundred other misdemeanors, but, in spite of all these conjectures it has stood the test all the summer in a glass-roofed building, where the temperature frequently rose to over 95 degrees, and has come through in good condition. It was examined by the judges in June, again in July, again in September, and lastly in October. The following is the recommendation issued on its behalf after the final judging:

WORLD'S FAIR GROUNDS, }  
JACKSON PARK, }  
CHICAGO, 13th October, 1893. }

We, the undersigned, judges of cheese at the World's Columbian Exhibition in October, 1893, certify that we this day examined the mammoth cheese from Canada in the Agricultural Building by boring into it with a trier to a depth of 33 inches.

We report the perfectly solid and quite toothsome. Its color uniform and attach a score card, recommend that a Canada.

Being informed thirteen months old roof, where the temperature was a source of surprise.

It is now going its case in attractive the Canadian North Canada, Victoria Cheese Ottawa, Canada." (leads the world in quality. The designation of 'Cheese from Canada,

The results from Canada. Everything labor on the farms. includes such a rotation fertility of the soil. of the people, and from ories and qualities of

We report that the cheese is sound from the rind to the centre, that it draws perfectly solid and cuts close in the texture; it has a good clean flavour, which is quite toothsome. In our opinion it has kept its flavour remarkably well. We found the color uniform and true; the workmanship of the making is most creditable. We attach a score card, which shows 95 points out of a possible score of 100 points, and recommend that a medal and diploma be awarded to the Dairy Commissioner for Canada.

Being informed of the conditions under which the mammoth cheese, now thirteen months old, was exhibited during the summer in a building with a glass roof, where the temperature often stood over 95 degrees, the excellence of its quality was a source of surprise and wonder to us all.

(Signed)

GEO. E. PERLEE,

A. H. BARBER,

A. F. MACLAREN.

It is now going to England, to be exhibited in the main cities, having painted on its case in attractive letters and colors: "Free Farms of 160 acres can be obtained in the Canadian North West." For information apply to the High Commissioner for Canada, Victoria Chambers, London, S. W., or to the Department of the Interior, Ottawa, Canada." On another part has been illuminated the statement "Canada leads the world in quality of cheese, wheat, apples, horses, bacon, sheep and grasses." The designation of "The Mite" itself also stands forth prominently "Mammoth Cheese from Canada, weight 22,000 lbs." Of this every ounce is good.

The results from the whole matter will be of prime and far reaching value to Canada. Everything that promotes the dairying business increases the demand for labor on the farms. That helps to retain a larger population in rural districts. It includes such a rotation of crops and system of culture as will help to increase the fertility of the soil. In the largest and best sense it furthers the material prosperity of the people, and from that arise progress in all the admirable and lovable accessories and qualities of life with contentment.

I have the honour to be

Your obedient servant,

H. S. FOSTER.

GROUNDS,  
PARK,  
October, 1893.

Exhibition in  
cheese from Canada  
th of 33 inches.

## LECTURE BY MR. A. R. JENNER FUST.

## ARE THE CARBO-HYDRATES SOURCES OF FAT IN THE ANIMAL ECONOMY, OR ARE THEY SOLELY PRODUCTIVE OF HEAT AND FORCE?

As to the theory still supported by many physiologists, who attribute the formation of animal fats also to the saccharine and starchy matters of vegetation, it seems to me wholly inadmissible; for from what source can the animal get the enormous quantity of heat necessary to decompose the sugar, for example, driving out one eighth-ninths of its oxygen and then making from it an amount of fat which will represent a sum of accumulated work, of latent heat almost double what is contained in that quantity of sugar? The animal does not have in itself this power of decomposing the water in order to store up work under the form of organic hydrogen; the plant alone can do that, by condensing the sun's heat. Electricity itself, though a powerful source of heat, cannot produce more than half of the work, for even if it could decompose the water and set the hydrogen free, it could not organize it.

Some have referred, in order to support the hypothesis of the formation of fat by means of hydrocarbons, to the slight amount of wax produced by bees for a short time with sugar, without seeing that this wax originated from the protein in circulation in the bodies of the bees themselves. This production of wax is soon arrested if the experiment is prolonged, while it continues very active when proteinic material, such as the white of eggs, is added to the solution of sugar. Others have cited the slight formation of glycerine which accompanies the alcoholic fermentation of sugar; but this results simply from the vegetation of the organized ferment. In short, we see that animal fat has no other origin than the fatty element in the forages and the protein of the food, which may form about half of its weight.

To the same conclusion we are brought by the experience of all practical farmers, who have very well understood that the most favourable foods for fattening animals are those rich in protein and the fatty elements, while the foods poor in these principles have very little value for that purpose, even if rich in sugar or starch. This is proved every day with swine, which fatten rapidly on pea meal, or on the oil cake of nuts or of meat, but very slowly on potatoes, artichokes or beets, though the latter are much richer in starch and sugar, but less so in protein or in fat.

Still further, all observations upon our domestic animals accord in showing that the fat and the protein of forages suffice to explain the formation of the fat found in the animal or its products, without any help from the hydrocarbons. Some sweet or starchy foods may, it is true, in certain cases, appear greatly to favour the accumulation of fat; but this is in the case of a ration insufficient in respiratory principles, or in which a great part of the fat and the protein of the food is compelled to serve for warmth, instead of being assimilated.

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Many years ago, when I had gained a considerable degree of proficiency in the practical part of farming, I was naturally inclined to turn my mind to the study of its theoretical side. At that time, about 1847-48, the great authority on the theory of farming was the illustrious Baron Liebig, the great German chemist. From a careful study of his works, I gained a vast fund of information; some of this I have no doubt forgotten, but the larger part remains by me to this day.

Among the various lessons taught me by the great scientist was one connected with the nutrition of animals; in effect, it showed that the chief source of fat is *non-nitrogenous* matter, such as starch, sugar, etc. These are not the exact words of the Baron's statement, but they convey his idea, as I recollect it.

"There is another constituent of the animal body, namely: fat, the production of which deserves notice. It is not an organized tissue, but is formed and collected in the cellular tissue under certain circumstances. These are, rest and confinement,—that is, a deficiency of oxygen and an abundance of food containing a considerable proportion of *non-azotised* matter, such as starch, sugar, etc. . . . Now, the chief source of fat is sugar, the composition of which is such, that when deprived of oxygen fat remains. . . . It is obvious, therefore, that fat can only be formed by a process of deoxidation; but it is produced when oxygen is deficient, and it appears, as Liebig has pointed out, that, when there is a deficient supply of oxygen, the production of fat, which is the consequence of the deficiency, yields a supply of that element, and thus serves to keep up the animal heat and the vital functions, which would otherwise be arrested. This is another beautiful instance of contrivance equally simple and wonderful. That fat must be formed by the deoxidising process is proved by the phenomena of the fattening of animals. A goose tied up, and fed with farinaceous food, altogether destitute of fat, acquires in a short time an increase of weight of several pounds, the whole of which is fat. Again, the bee produces wax, a species of fat, from pure sugar."—*Turner's Elements of Chemistry*.

I am told by those who ought to know, that this position of the great German is now disputed by some of his own countrymen. In England, however, and in this country, all the leading men whom I have consulted take Liebig's side of the question, just as, in practice, the goose and the bee in the passage quoted do.

For instance: Dr. Girdwood, Professor of Chemistry at McGill College, Montreal, and a practical farmer too, told me, the other day, that he had not the slightest doubt about the truth of the principle that the carbo-hydrates, or non-azotized parts of the food, are sources of fat in the animal economy.

Dr. Baker Edwards, the well known analytical chemist, who has been so successful in his dealings with the milk-vendors of our fair town, holds the same position most strongly, and Mr. Penhallow, Professor of Botany, at McGill, has no doubts on the subject.

What says Mr. E. W. Stewart, the author of "Feeding Animals," whose answers

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to enquirers on that subject are so well known to all the readers of *The Country Gentleman*?

"Carbo-hydrates are composed simply of carbon and the elements of water—hydrogen and oxygen, non-nitrogenous compounds. The principal of these are woody fibre, starch, gum, and the various kinds of sugar. This is the food that keeps up animal heat, and the surplus goes to lay on fat in animals."

Mr. Henry Gray, a member of the Sanitary-Board, and a man thoroughly acquainted with farming as well as a practical chemist, writes to me as follows:

"Dear Sir,

I cannot understand how the people you speak of can lay down the dogmatic assertion that the Carbo-hydrates cannot be transformed into fat.

Stewart on feeding &c., no mean authority, tells us that "Lawes and Gilbert carried out a thorough series of experiments on pigs that fully corroborated Liebig's views and proved quite decisively that carbo-hydrates were transformed into fat," and he furthermore tells us that it has been stated that Pettenkofer, Wolf and other German chemists who had held different views, have recently acknowledged the correctness of Lawes and Gilbert experiments.

One of the first rules laid down by medical specialists in treating corpulency is not to eat food containing starch, sugar, or gum. Even the little negroes on the Southern plantations used to wax fat as the sugar cane ripened, especially if they were big enough to run about with a piece of well sucked cane in their hands.

To say the least, the assertion is entirely in opposition to a fact which it appears to me has only recently been well established and I should much like to hear the opinions of men better posted than myself on this important subject.

Truly yours,

HENRY R. GRAY."

Mr. Thomas Macfarlane, the Chief Government Analyst, of Ottawa, has been kind enough to send me his opinion; it reads thus:

LABORATORY OF THE INLAND REVENUE, OTTAWA.

"A. R. JENNER FUST, Esq.,

Editor *Journal of Agriculture*,

Montreal.

Dear Sir,

I am in receipt of your favor of yesterday and in reply would state that I have always been under the same impression as yourself and Dr. Girdwood regarding the formation of fat from the carbo-hydrates. I must add, however, that I have no experience of my own on the subject. Among the authorities I observe that Stewart in his book "Feeding Animals", (p. 38), asserts that animals "are also able to store up fat from the carbo-hydrates." On the other hand König, in his "Narungs and Genuss-

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mittel," says the matter is still in doubt. He writes: "according to new experiments it appears that a production of fat from the carbo-hydrates is more than probable in the case of gramminivorous animals and the pig, but it is denied that this takes place in the case of flesh eaters."

Yours truly,

THOMAS MACFARLANE."

Mr. E. W. Stewart, mentioned above, says in his "Feeding Animals," when treating of the formation of flesh and fat:

"The popular idea had been that all animals, except the fattest, contained more flesh than fat; but Lawes' tables refute this idea most conclusively. The fat ox and lamb contain above *three times* as much fat as lean flesh."

"Mean of six *fat* and *very fat* animals; carcase:

Lean flesh, 12.30%—Fat, 39.70%."

Therefore I conclude that the comparatively small per centage of *fatty* matters and albuminoids contained in the food cannot be the source whence all this fat is derived."

Again Mr. Stewart says:

"Oil has a great effect in the rapid fattening of animals, *but they are also* able to stow up fat from the carbo-hydrates.

"The animal possesses the power of preparing fat from starchy food when there is not fat enough ready formed for its wants.

"Almost all food contains fat, but not in quantity sufficient to account for all the fat laid up by the fattening animals, or *the fat in the milk of the cow.*" Please observe the last words of the above sentence.

"Voit, Pettenkofer, and other German chemists were inclined to doubt if the carbo-hydrates were ever used to produce fat, as Liebig had held many years before; but Lawes and Gilbert, in their experiments on "Pig-feeding," *fully and decisively* proved that carbo-hydrates are transformed into fat. The pigs were fed upon barley-meal, *and the fat and albuminoid matter in the barley-meal* were wholly insufficient to account for the fat formed in the bodies.

And now comes Mr. Stewart's expression of the opinion of practical feeders as confirmed by practical experiments conducted by skilled experimenters, thoroughly familiarised with the management of tests:

"The practical common sense of feeders has taught them *that foods having a large proportion of starch are particularly adapted to produce fat, or milk rich in butter, and these impressions, derived from general practice, have withstood all the doubts of scientific investigators based upon inadequate experiments.*"



"We saw one case of three pigs fed upon *corn-meal*, prepared in the best way to induce them to eat largely of it with the expectation of producing a large growth at an early age. The result was, that at 130 days, these pigs were mere squabs of fat."

"The sugar of milk is very soluble and will lay on fat rapidly if the other constituents are added."

Lastly, the professors of chemistry at the Central Experimental Farm at Ottawa, have kindly sent me the following expression of their opinion on this matter:—

OTTAWA, Nov. 6th, 1893.

"This is a question regarding which there is still much difference of opinion among physiologists, and towards the solution of which there are many experiments now in progress by German and other scientists.

Of late years, the results of experiments carried on in Germany have corroborated the results obtained by Messrs. Lawes and Gilbert, of England, who, I think, have clearly shown that fat in the animal may be, and often is, formed from the carbohydrates. This was predicted years ago by the celebrated chemist Liebig; but later was discredited by his own countrymen, who held that their experiments proved that fats were produced in the animal economy exclusively from fats and albuminoids in the food, and, further, that the sole function of the carbo-hydrates was to produce heat and energy.

Although there can be no doubt that the greater part of the fats in the body are produced from fats and albuminoids of the food, it is also doubtless true that a part of such often is formed from the carbo-hydrates.

It should not be lost sight of that very important function of the carbo-hydrates in the animal is to preserve or protect the fats from undue waste.

Yours faithfully,

FRANK T. SHUTT, M.A.,  
Chemist."

Carbo-hydrates in a food, are not only productive of heat and energy in the animal, but also serve as a source of fat. As they contain no nitrogen, they cannot act as flesh producers.

Sugar is a well known fattening agent, and, as starch is converted into sugar by the digestive juices it must also act in the same manner.

P. H. ROSSIGNOL,  
Asst. Chemist.

So much for the authorities on this side of the Atlantic; now, turn we to the English writers on this subject.

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Mr. F. J. Lloyd, Fellow of the Chemical Society, and one of the leading Professors of Agricultural Chemistry, holds, as you will see, very strong opinions as to the power animals have of appropriating the non-nitrogenous constituents of their food and converting it into fat.

Some time ago, I wrote to him to know if he had any knowledge of a theory that I had heard bruited abroad here, viz., that in no case are the carbo-hydrates of food converted into fat in the animal economy." "Warrington," said my letter, "Claude Bernard, Lawes and Gilbert, Dumas, Milne-Edwards, E. W. Stewart, an American writer, and Liebig, all, as far as I can recollect, hold that starch, sugar, &c., are sources of fat. *Practically*, I am sure that the carbo-hydrates *are* converted into fat, but I should like to know the last decision of *science* on this subject. To this Mr. Lloyd replied as follows :

"I cannot understand how the views stated by Mr. Jenner Fust, can be promulgated by any scientific man without very remarkable evidence to support them, *in which case they would probably be better known*. Our present view is as stated in the letter—(*i. e.* that the carbo-hydrates are convertible into fat.)

(Signed)

F. J. LLOYD."

Some of you may have met with a little book named, "The Chemistry of the Farm," by another Fellow of the Chemical Society, Mr. R. Warrington. This gentleman was selected to contribute this opuscle to the series of "Handbooks of the Farm," by the late John Chalmers Morton, Editor of the *English Agricultural Gazette*, and of many other valuable agricultural compilations. In treating of "Animal Nutrition," Mr. Warrington says :

"The carbo-hydrates (non-nitrogenous parts) of the food include starch, sugar, and cellulose ; these substances consist of carbon, hydrogen, and oxygen, the last two being in the proportion to form water—hence the name." (In fact, carbo-hydrates are water + carbon). Carbo-hydrates form the largest part of all vegetable foods. They are capable, when consumed in excess of immediate requirements, of conversion into fat.

P. 100.—"For the body to increase in weight it is clear that the food supplied must be in excess of the quantity demanded for mere renovation of tissue, and for the production of heat and work. When such an excess of food is given, a part of the albuminoids and ash constituents is converted into new tissue, while a part of the fat, *carbo-hydrates*, and albuminoids is stored up in the form of *fat*,

P. 102.—"In calculating the amount of food consumed for the production of heat and work, it has been assumed that the *fat* in the increase has been derived from the fat and the *carbo-hydrates* supplied by the food."

Mr. Wrightson, Principal of the College of Agriculture, Downton, near Salisbury, England, combines great scientific acquirements with a thorough practical knowledge of farming. The college-farm, which he manages himself, contains between 500 and

600 acres, and his usual stock consists of 500 breeding ewes, and 12 to 15 milch-cows, besides a number of pigs and fattening beasts. His expression of opinion is concise but emphatic: "*Sugar is a fattening food, and so is starch.*"

Again, Monsieur Grandeau, a most important figure in the agricultural instruction department of France, has a good deal to say on this question. M. Grandeau is: Director of the "Station agronomique" of the East; Inspector-general of the "Stations agronomiques"; Professor at the National Conservatory of Arts and Trades, and Member of the Higher Council of Agriculture of France; so, I suppose he may be taken as an authority.

M. Grandeau's first volume on the "Feeding of animals and men" was published in 1893; (the second volume is not out yet). From it I extract the following paragraphs:—

(Page 151.)—"Liebig's conclusions.—In 1842, Liebig's opinion on the production of animal fat may be abridged thus:

1. He holds that fat is formed in the body of the animal from the *starchy matters* (*fécule, amidon*), from the sugar and nitrogenous matter (fibrin, albumen, vegetable casein).

2. Fat is produced every time there is a disproportion between the carbon produced by the food and the oxygen absorbed. (When the quantity of the latter is insufficient to burn all the carbon). The oxygen of the food separates itself by the metamorphosis of certain substances, and escapes under the form of carbonic acid and water.

3. The animal economy in making fat obtains the means of making up for the want of oxygen and heat, both indispensable to the accomplishment of vital action.

4. Rest and housing increase the production of fat."

(P. 175.)—"Liebig had stated that:

1. The fat in food is insufficient to explain the fattening of animals.

2. *Fat comes from the transformation of starch and sugar.*

3. Nitrogenous matter concurs in the formation of fat.

Now, Boussingault, in his work on "The fattening of pigs," definitively confirms these statements of Liebig."

(P. 178.) III.—"General conclusions on the origin of fat. The general conclusions that this retrospective review enables us to establish are briefly these:

1. Plants contain fatty matters.

2. The quantity of fat contained in the food is too trifling to represent the fat found in the animal.

3. Animals have the power of transforming sugar into fat (bee's wax).

4. Animals have the power of transforming starch into fat (pigs, geese, ducks).

5. Nitrogenous matter plays a considerable part in the fattening of animals.

Such, in a few words, is the state of the question in 1893; we shall see later that

the experiments of the German school, concerning the origin of animal

(P. 361.)—"I considered, say La

(P. 312.) *Conc* at the disposal of *possess on the probab* *growth of animals su*

And now we a "Pig-feeding," conc Albans, Hertfordsh pages (85 closely pr that they were dra experiments and n making tests, have the perfect trustwor their names stand to support. And, now

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NOTE 1.—"The half the quantity of starch and other non- of the respiratory and

NOTE 2.—"India nitrogen, but a comp starch series (the car non-nitrogenous subst piratory process, and

NOTE 3.—"We fir almost any of our cur with a deficiency of the

NOTE 4.—"As the of the nitrogenous and



the experiments of Lawes and Gilbert, as well as the numerous experiments of the German school, confirm in all essentials the fundamental hypothesis of Liebig on the origin of animal fat.

(P. 361.)—"In practice as well as in theory, fat and the starch series may be considered, say Lawes and Gilbert, as replacing one another in our foods."

(P. 312.) *Conclusion.*—"In short, the masterly essay of Lawes and Gilbert places at the disposal of farmers, chemists and economists *the only complete document we possess on the probable composition of the live beast, and on the composition of the increased growth of animals submitted to different kinds of feeding.*"

And now we arrive at our last but most valuable evidence: the experiment on "Pig-feeding," conducted by Lawes and Gilbert, at the Rothamsted farm, near St. Albans, Hertfordshire, England. Any one who will take trouble to glance at the pages (85 closely printed 8vo) of this series of patient investigations must see at once that they were drawn up by men thoroughly accustomed to the management of experiments and not likely to be biassed one way or another as are those who, in making tests, have some ulterior object to gain. However, I need say no more as to the perfect trustworthiness of any investigation conducted by Lawes and Gilbert, as their names stand too high throughout the whole civilised world to need my weak support. And, now, for a few extracts from the "Experiments on Pig-feeding."

The *highly nitrogenous* food—a mixture of equal weights of *horse-beans* and *lentils*, was employed.

As the comparatively *non-nitrogenous* food, *Indian corn-meal*.

For the purpose of the experiments, 100 pigs from 9 to 10 months old were bought, as nearly as possible of the same stamp, and the test was not begun until the pens of three pigs each had, by a judicious application of the whip, been taught the wisdom of living peaceably together.

NOTE 1.—"The grains, as compared with the leguminous seeds, contain scarcely half the quantity of the nitrogenous compounds, but they abound much more in starch and other *non-nitrogenous* compounds which are believed to provide the chief of the respiratory and *fat-forming food of the animal.*"

NOTE 2.—"Indian corn meal, compared with beans and lentils, contains little nitrogen, but a comparatively large amount of the *non-nitrogenous* substances of the starch series (the carbo-hydrates), and also more fatty matter. It is these various *non-nitrogenous* substances that are supposed more particularly to serve for the respiratory process, and for the formation of fat in the animal body."

NOTE 3.—"We find that, beyond a somewhat narrow limit, which is attained with almost any of our current *fattening-foods*, any defect is much more likely to be connected with a *deficiency of the important non-nitrogenous constituents than of the nitrogenous ones.*"

NOTE 4.—"As these two pigs ripened (*i. e.* got fat), they naturally selected less of the nitrogenous and *more of the starchy and fatty food.*"

NOTE 5.—“No one practically acquainted with pig feeding will doubt that the pigs in pens 5 to 8, where the food consisted, in such very large proportion, of barley-meal, would progress more favourably as to the quality of their increase, or that they would contain a larger proportion of fat, and consequently of dry substance, than those upon the bean and lentil dietaries of pens 1 and 4.”

Just so: in England, we fatten upon barley-meal and make the flesh firm by a dietary of peas during the last three weeks of the fattening period.

NOTE 6.—“\* \* \* The difficulty of determining whether the gross increase obtained be composed of fat formed from the starch and oily series of compounds, or whether of flesh from the nitrogenous ones.”

NOTE 7.—“The larger the proportion of nitrogenous compounds in the food, the greater the tendency to increase in frame and flesh; but the maturing or ripening of the animal—in fact, its ‘fattening’—depends very much on the amount in the food of certain non-nitrogenous constituents.

NOTE 8.—“All our feeding results consistently show, that the theory that assigns to the different substances used as fattening foods a value in proportion to their per centage of nitrogenous compounds, is FALLACIOUS.

There are a dozen other notes, to the same effect, to be found in the essay I have been quoting from, but I think I have brought forward enough, and that I may fairly lay claim to have established my point that THE CARBO-HYDRATES OF THE FOOD ARE SOURCES OF FAT IN THE ANIMAL ECONOMY.

ARTHUR R. JENNER FUST.

#### CORRESPONDENCE

BETWEEN M. J. D. LECLAIRE, SUPERINTENDENT OF THE DAIRY SCHOOL OF ST. HYACINTHE, AND M. GABRIEL FLEURY, ON THE LECTURE BY THE LATTER ON THE WORKING OF BUTTER.

M. GAB. FLEURY,

Professor of Agriculture, La Trappe, Oka.

Sir,—

I have read, attentively, your essay, and I do not hesitate to say that it is the most scientific and thoughtful that has ever been delivered on the subject at any of the meetings of our association. Still, I must say that your method of churning seems to me to be rather peculiar. Do you not fear that, putting the cream into the churn at 58° to 60° F. and stopping churning when the butter is in lumps of about a pound each, it will be impossible at that temperature to entirely expel the buttermilk and to obtain butter free from it?

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M. J. LECLAIRE,  
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DEAR SIR,

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You support this practice of *churning into lumps* by the advantage of guarding the butter against the attacks of air and water, and I am perfectly in accord with you as to their injurious effects. But we never, in our way of churning, have grains of butter so small as  $\frac{1}{8}$ , even of  $\frac{1}{4}$  of an inch in diameter; we advise  $\frac{1}{2}$  inch, but at a temperature of 54° to 56° at most. The washing is thus done more easily, and we avoid having to work the butter a second time.

You base your method, again, on a practice followed in France; it might be right in that country from certain circumstances, but is it not vicious in itself, and is it not followed as being the only means of making a passable article with the material that is dealt with there, *i.e.*, butters bought on the market from different farmers, who have already worked it once at home? I should be glad to have some explanation from you as to this.

Believe me, sir, etc.,

J. D. LECLAIR.

M. J. LECLAIR,

Superintendent of the Dairy School of St. Hyacinthe.

DEAR SIR,

In answer to your objections, I must first go over my statements briefly, insisting on the points I think the most important.

One of the characteristic features of the mode of making that I submitted to the convention, is the churning of butter into lumps of about a pound, without adding water, the cream being placed in the churn at a temperature of 58° to 60°, and the butter washed on a turn-table supplied with a water-sprinkler.

One of the chief reasons I alleged for this was the action of water on the fatty matter in butter. I explained that this method gave a butter of light flavour, but that this might develop itself later.

My object in trying it was to make a long-keeping butter; my idea was:

1. If one could get an absolutely fresh butter, and consequently *deprived from the very first, as far as possible*, of all matters which, like butyric acid, communicate a certain aroma, but which, continuing subsequently to develop themselves, might give, when in excess, a flavor either of rancidity, of tallow or of fish;

2. If one could regulate the production of these bodies, so as to bring the butter to maturity in a certain determinate lapse of time, then the problem of making export butter would be solved.

The method of making, of which I spoke, solves pretty nearly the former part of the problem; as to the second, the maturing of butter, I have had neither time nor means to pursue its investigation, circumstances having obliged me to leave dairying for other occupations.

This much for export butter; for butter intended for immediate local consumption, whose aroma must appear at once, the question is utterly different; in this case,



the question of maturing may be neglected, and we may practise a quick, simple and prompt method of making, by which the cost of production will be lessened.

By explaining the method that seems to me to be the best in this case, and by defending it, I shall consequently justify my process and reply to your question about French butter, which, I must say here, can compete with any butter in the whole world.

For general rules for making butter for local use, I say that :

1 The addition of water and the washing of butter, at low temperatures, in the churn, are not to be recommended with half-sweet cream ;

2 Working butter, after salting and leaving it undisturbed for 18 to 24 hours at a low temperature, is better than working it at once after thorough washing in the churn with very cold water ;

3 Churning butter, at too low a temperature, does not do so well as churning between 58° and 60°,—*especially as concerns the aroma.*

I cannot enter here into all the chemical questions that have already been discussed about this matter, for the reactions that occur in machines used in manufacture are in general more complicated and more difficult to discern than those in the laboratory, on account of the frequent intrusion of the "infinitely little", and especially of the complexity of the liquids or bodies employed in the industry. *Such an enquiry would be too lengthy here.*

I do not know if, since I left off the earnest pursuit of dairying, other progress has been made, and I cannot do better, in supporting the three general rules I advanced, than to relate the results known to science, at the time when I left the business, that is, about three years ago, and by quoting a chemist and a manufacturer of the best known authority, who have studied the question pretty closely.

1. "According to the method of skimming employed," says Fleischmann, "so would be one or other of the modes of working the butter be selected. With very sweet, thin cream, as in the system of Swartz and of the Dutch, the butter would be worked dry without any water. Contrariwise, the methods of skimming that yield a thick, sour cream, like those of Gussander and the Devonshire,<sup>1</sup> must be worked with water. With the moderately thin and slightly acid cream produced by the Holstein system, water may be used, but in moderation, and its purity must be looked into. This proceeds from the fact that the butter will keep all the better the fewer solid matters there are in its serum, and as the serum varies with the consistence and sourness of the cream, we cannot proceed, in the different cases, in the same way of expelling the solid matters. (See Fleischmann on Dairying, chap. xlviii, p. 569.) A little farther on, he adds that "some writers state that the *delicate flavor and scent of butter suffer by washing*, and that washed butter, even when it is salted at once, generally contains more water than butter that has not been washed : this may per-

<sup>1</sup> The practice of making "clotted cream" and then simply stirring it for a couple of minutes with the hand.—A. R. J. F.

haps not be with same chapter, 18 hours after salting and one highly after a washing with exporters in Denmark the rules laid down with the butter ; with skimmed milk practice was followed on a large scale in Denmark after salting, before

As to the art of butter made most and Mecklenburg, a very sour cream, a

Many other ways followed in Europe washing butter in the of washing in water, physical distinction perfect must be the butter each piece ; in the carries it away ; in particles.

From my personal believe that :

1 It is better, use is wanted, to deal as I explained in my matters, which are should be kept a little

2 For the same mer, and the butter after an interval of 2

3 While the cream dominate, the more keeping ; it is for this opening until the butter ripening.

4. During the maturing act, the sourer will be

haps not be without its influence on its keeping quality." Still further on, in the same chapter, Fleischmann recommends working butter twice, the second time 24 hours after salting and rest, and, besides, this is a practice in general use in Europe and one highly approved of. The washing he speaks of is a kneading in water, but not a washing with lots of water in the churn. On the other hand, the first butter-exporters in Denmark and among others, Mr. Busk, jr., & Co., of Copenhagen, said in the rules laid down for making butter: "In no case should water come into contact with the butter; if it is wished to wash butter after churning, it ought to be done with skimmed milk." Here, he is speaking of butter from sweet cream. This practice was followed for a long time, and even up to the present I believe, on a large scale in Denmark. Mr. Busk leaves the butter at rest for some time in a cold chest after salting, before finally reworking it.

As to the aroma Fleischmann says (Dairying, chap. xlv, p. 551): "The best butter made most carefully from moderately sour cream, as is the practice in Holstein and Mecklenburg, has a peculiar aroma that is wanting in Dutch butter, made from very sour cream, as well as in the butter from sweet milk."

Many other writers recommend dry-working, and the process is very generally followed in Europe. Except in America, I have never seen the practice of briskly washing butter in the churn with cold water approved of. In Europe, when we speak of *washing in water*, *kneading in water* is meant, and between the two there is a vast physical distinction. In the former, the more thoroughly we want to wash, the more perfect must the butter be disintegrated, for the water only reaches the outer part of each piece; in the latter, the buttermilk is expelled by pressure, and the water carries it away; in this case, there is no good in dividing the butter into minute particles.

From my personal experience and from my studies and researches I am led to believe that:

1 It is better, as concerns the aroma as well as the yield, when butter for immediate use is wanted, to deal with cream of rather more than ordinary thickness, as in this way, as I explained in my lecture, a greater chance is given to the ferments of the fatty matters, which are the chief sources of aroma. The temperature of fermentation should be kept a little higher than in the case of export-butter.

2 For the same butter the churning temperature should be 58° to 60°, in summer, and the butter should be kneaded in very pure water, then salted and reworked, after an interval of 24 hours, at 50°;

3 While the cream is ripening, the more the ferments of the fatty matters predominate, the more aroma will be produced, and the less fit will the butter be for keeping; it is for this reason that I have tried to prevent these ferments from developing until the butter is made, and that I tried in this way to solve the problem of ripening.

4. During the maturing of the cream, the more the ferments of the lactic acid act, the sourer will be the cream, the less aroma will the butter have, the longer

will it keep, but the less must it be washed with cold water in the churn; for, in this case, the serum of the cream is greatly modified and, if the churning temperature be lowered, the action of the water on the serum is more active than when the butter is softer. When the butter is soft, the volatile or liquid acids are retained, by capillary attraction, with greater power than when it is hard. Without entering deeply into this, which would take up too much time, I will only say that it is better in this to churn at a higher temperature and to use as little water as possible;

5. The differences of opinion, on the subject of washing in water, and maturing, arise from a misunderstanding in terms. We understand by the word washing, kneading in water as well as washing in the churn, and make no distinction between the two. The differences of opinion on the ripening of cream also arise from not making a distinction between the cases: 1. when the lactic acid ferment predominates; 2. when they ferment of the fatty matters predominates;

6. In writers, one finds the most opposite conclusions in all those subjects, precisely on account of this confusion in terms; I might, perhaps, say, on account of a confusion of ideas;

7. I have observed, in my experiments that the casein contained in the mass of butter by the kneading is not without influence on the aroma. Some analyses of butter by M. Duclaux have even led me to think that the whole of the casein should not be washed out of the butter, and that a trifling quantity of it might guarantee its keeping: and it is, I believe, in profiting by this that the problem of ripening may be solved.

However that may be, all these questions are very delicate, and the general rules are all the more difficult to formulate as the conditions vary with every dairy, in the seasons, in the cows, and with the maker himself.

We know, indeed, that: 1. the nature of the glycerides of butter is affected by the breed of the cows, the pasture, and the seasons; 2. That the quality of the water varies in every dairy, and that the water may react on the scent-imparting acids of the butter as does a base on an acid, or on the glycerides as a base on a fatty matter; 3. the microbiologic temperature of a dairy depends greatly on the methods practised by the maker himself, and on the attention to cleanliness he devotes to his work.

In dairies, it may be said that the most trifling causes produce appreciable effects; these causes are very numerous; it is not then surprising that we have a difficulty in understanding one another. But I am inclined to think that the rules I have quoted are nearly the truth, when we find ourselves in a normal situation.

Yours, etc.,

G. FLEURY.

## PAYMEN

Our 10th Report  
completely exhausted,  
diffusing abroad to  
furnish the members

Professor Bakk  
have sought his place

Here is his address

M. E. Castel,

Dear Sir,

Your letter about  
the instructions for  
bulletin translated,



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## PAYMENT FOR MILK ACCORDING TO ITS RICHNESS.

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### TESTING MILK BY THE BABCOCK.

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Our 10th Report, which contained the description of this process, being completely exhausted, it seemed necessary, on account of the importance of promptly diffusing abroad the method of paying for the milk according to its richness, to furnish the members of our association with new details on this way of testing.

Professor Babcock having just published a fresh bulletin on this subject, we have sought his permission to reprint it in our report.

Here is his answer :

Experiment-Farm Station, Wisconsin,  
Madison, Wis. Nov. 22nd, 1893.

M. E. Castel, St. Hyacinthe,

*Dear Sir,*

Your letter about the translation into French of bulletin 36 of this station, on the instructions for testing milk, has reached me. I shall be happy to have this bulletin translated, if your association desires it.

Yours, very sincerely,

S. M. BABCOCK.

. FLEURY.

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## EXPERIMENTAL FARM-STATION OF THE UNIVERSITY OF WISCONSIN

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### BULLETIN No. 36.<sup>1</sup>

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#### INSTRUCTIONS FOR TESTING MILK BY THE BABCOCK PROCESS.

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##### DESCRIPTION OF THE APPARATUS.

2. *Test Bottles.*—The form of the test bottles used in this test is shown in Fig. 57. They should be made of heavy glass and should contain, up to the neck, not less than 40 c. c. Each division of the graduated scale upon the neck represent .04 c. c. Five of these divisions are equivalent to one per cent. of fat when 18 gms. of milk are used in the test, it being assumed that the specific gravity of the butter fat, at the temperature at which the reading is made (about 120° F.), is 0.9. The graduation extends from 0 to 10 per cent., which is sufficient for all ordinary tests of milk. When it is desired to determine the fat in cream a longer scale is required, if the same quantity is taken for the test. To increase the length of the scale sufficiently for this purpose with bottles of the usual form is impracticable, as such bottles would not only necessitate extra care in filling and cleaning, but would require a special machine for whirling. This difficulty has been overcome by the test bottle shown in Fig. 58, devised by Mr. J. M. Bartlett\* of the Maine Agricultural Experiment Station.

This bottle differs from the regular test bottle in having a bulb blown in the neck, the graduation commencing below the bulb, which holds 10 per cent. With this bottle cream up to 23 or 25 per cent. of fat may be tested in the same manner as milk.

Parties ordering bottles of this kind should designate them as cream test bottles No. 1.

In creameries where skim milk is to be tested, a few bottles containing double the amount of those mentioned above or about 80 c. c. up to the neck, should be provided, as a double quantity of milk may then be taken. This will increase the

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<sup>1</sup> Bulletin 3, Second Series, Maine Agricultural Experiment Station.

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Fig. 1.

The divisions of t  
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quantity of fat, and proportionately diminish the error of reading. When this is done the divisions of the scale are equivalent to .1 per cent. of the fat instead of .2 per cent., as is the case where only 18 grams of milk are used. Such bottles are also convenient in making composite tests as described on page 239.

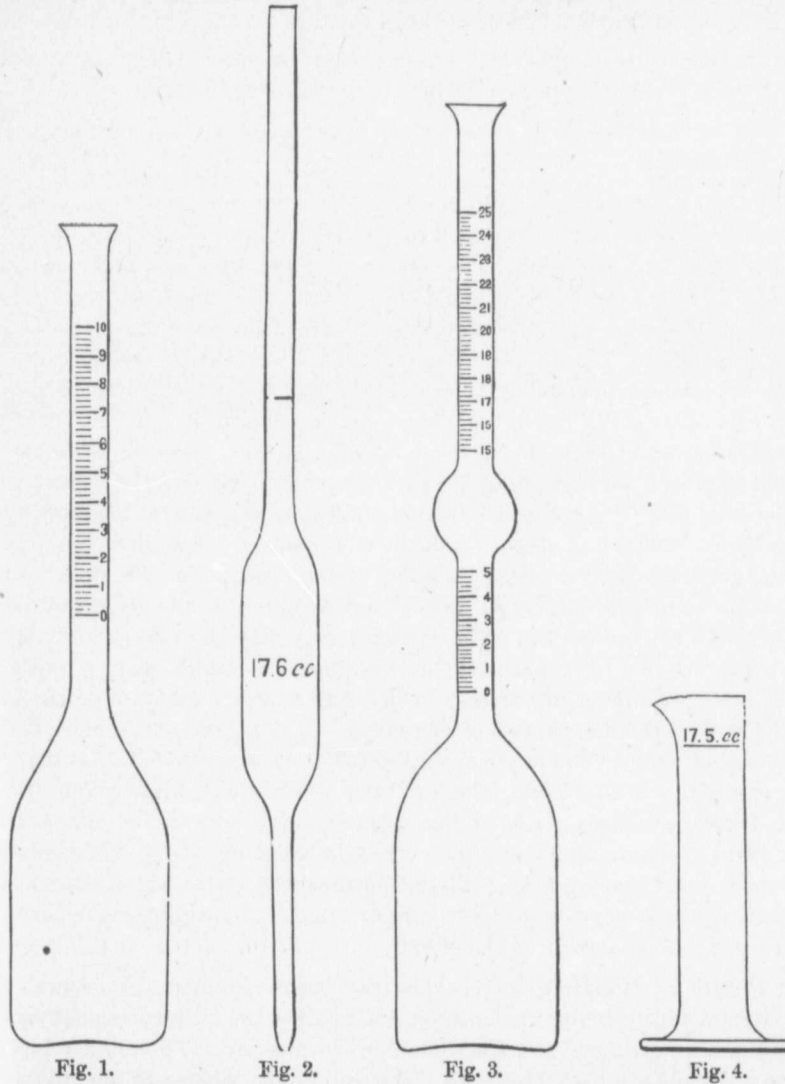


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

The divisions of the scale on the necks of the bottles should be uniform, and the lines should run straight across the neck, and not obliquely, as is sometimes the case.

OF WISCONSIN

PROCESS.

is shown in Fig. 1. The neck, not the body, represents .04 per cent. when 18 gms. of milk are used. The ordinary tests of the fat content of milk require, if the scale is not graduated, as such a bottle, but would be overcome by the Maine Agricultural Experiment Station.

blown in the neck of the bottle. With the same manner as the ordinary test bottles.

ream test bottles.

maintaining double the volume of milk, should be provided to increase the



When new, the lines and numbers of the scale are usually blackened so that they are easily distinguished, but after the bottles have been cleaned a number of times the color may be washed away, leaving the lines indistinct. They may be restored by rubbing over the scale with a lead pencil, or if a number of bottles need attention, with a cloth having a little black paint upon it.

The bottles should be numbered in some way. A good method is to have the number stamped upon a copper ring which is slipped over the neck.

I prefer to have the number marked up in the glass with a diamond or etched with fluorhydric acid.

*Calibrating the Bottles.*—The 10 per cent. of the fat represented upon the necks of the bottles correspond to a volume 2 c. c. It is divided into 50 equal parts, 5 of which are equal to 1 per cent. The accuracy of the scale may be approximately determined by filling the bottle to the 0 mark with water, and after wiping out the neck of the bottle with a piece of filter paper, measuring into the bottle 2 c. c. of water, with a delicate pipette, which should fill the bottle to the 10 per cent. mark. If a chemical balance is available the calibration may be accurately made by weighing the bottle when it is filled to the 0 mark and again after it is filled to the 10 per cent. mark with water, care being taken to wipe all the moisture from the neck of the bottle before each weighing. The difference in weight should be 2 grams. The calibration may be more rapidly done by introducing 2 c. c. of mercury into the bottle and, after fitting a small cork into the mouth of the bottle, inverting it so that the mercury will flow into the neck; the length of the column may then be measured with a pair of dividers; this length should correspond with the length of the scale from 0 to the 10 per cent. mark. The same mercury may be easily transferred from one bottle to another by connecting the necks of the bottles with a short piece of rubber tubing and inverting them. In this way a large number of bottles may be calibrated with the same volume of mercury. In doing this care must be taken that no drops of mercury are left adhering to the sides of the bottles. As the specific gravity of mercury is 13.59, two cubic centimetres will weigh 27.18 grams. Where facilities for weighing are at hand this quantity may be weighed out, and 2 c. c. obtained with great accuracy, as slight errors in weighing do not materially affect the volume. In comparing bottles in this manner the bottles should be clean and dry. Bottles which vary more than 0.2 per cent. in the whole length of the scale from 0 to 10 per cent. should not be used.

2. *Pipette for Measuring Milk.*—This may be of any form, but that shown in Fig. 59, with a wide opening at the lower end to allow the milk to run out rapidly is to be preferred. It should contain when filled to the mark 17.6 c. c. A pipette of this size will deliver a little less than 17.5 c. c. of milk which, if the milk has the average specific gravity of 1.032, will weigh 18 grams. The pipette should be accurately calibrated. It may be tested by weighing the amount of mercury necessary to fill it to the mark. The weight of mercury should be 239 grams.

In purchasing c. c. This precaution furnished with the pipettes give read however, is not the butter depends so show the amount of from it.

3. *A Measure* pour from and a sin

It is not essent in the amount of ac

The automatic the carboy to the to be used with advant made each day. T persons accustomed and liable to breakag

4. *Centrifugal* test by the leading should be capable of the diameter of the more revolutions the practical and it need mitted by belt or by slipping, as otherwis imperfect separation greatly to be preferre thus making it easy are made.

Recently a numl many advantages for tain an even speed, water for filling.

5. *Commercial s* acid is to be preferred the right strength. I be held in solution an

<sup>1</sup> Bulletin 16, Ill. Agri

<sup>2</sup> Bulletin 19, Iowa A

In purchasing apparatus for this test, be sure to obtain pipettes containing 17.6 c. c. This precaution is necessary as pipettes of several different sizes have been furnished with this test. This has usually been done on the plea that the larger pipettes give readings which will agree with the butter yield from the churn. This, however, is not the case, and cannot be accomplished by any test, as the yield of butter depends so largely upon the skill of the dairyman. The test is designed to show the amount of pure butter fat in the milk and not the butter which will be made from it.

3. *A Measure for Acid.*—A graduate or cylinder of glass, Fig. 60, with a lip to pour from and a single mark at 17.5 c. c., is the best known form for general use.

It is not essential that the measure be accurately calibrated, as slight variations in the amount of acid used will not affect the results by the test.

The automatic pipettes, for delivering the proper amount of acid directly from the carboy to the test bottles, devised by Prof. Farrington<sup>1</sup> and Prof. Patrick<sup>2</sup> may be used with advantage in laboratories or factories where large numbers of tests are made each day. These devices, however, should only be placed in the hands of persons accustomed to handling delicate apparatus, as the glass parts are expensive and liable to breakage if carelessly handled.

4. *Centrifugal Machine.*—So far as I have seen, all of the machines made for this test by the leading dairy supply firms, are suitable for the purpose. A machine should be capable of making from 700 to 1200 revolutions per minute, according to the diameter of the wheel which carries the bottles. A small wheel should make more revolutions than a large one. A wheel less than 12 inches in diameter is not practical and it need not exceed 20 inches. In machines where the motion is transmitted by belt or by friction the adjustment should be kept tight enough to avoid slipping, as otherwise the motion may be much less than is intended and result in an imperfect separation of the fat. Machines which carry an even number of bottles are greatly to be preferred, as in such the bottles are placed directly opposite each other, thus making it easy to preserve the equilibrium of the apparatus when a few tests are made.

Recently a number of steam turbine machines have been introduced which have many advantages for factories where high pressure steam is available, as they maintain an even speed, prevent the cooling of the bottles, and supply hot distilled water for filling.

5. *Commercial sulphuric acid* having a specific gravity of 1.82-1.83. The stronger acid is to be preferred. It is very important that the acid used have approximately the right strength. If it has a specific gravity much below 1.82, the casein may not be held in solution and being mingled with the fat will give an unsatisfactory test.

<sup>1</sup> Bulletin 16, Ill. Agr. Expt. Station, 1891.

<sup>2</sup> Bulletin 19, Iowa Agr. Expt. Station, 1892.





give a good test, but it will act upon the milk which will be of fat and prevent the results obtained by using

such acid, which blackened the fat even when used in small quantities and with which it was impossible to obtain satisfactory results have been met with. The cause of the trouble is unknown, and the best remedy is to change such acid for that from a different lot, as most of the sulphuric acid which has the correct specific gravity will be found to give good results.

When a carboy of acid is purchased the wooden case should not be removed from it, as by so doing the risk of breakage is greatly increased. At least one serious accident has happened in a factory during the past year by carelessly handling a carboy of acid that had been removed from the case.

The acid should always be handled with great care as it is very corrosive, causing serious burns when allowed to remain upon the skin, and destroying clothes when it comes in contact with them. Whenever acid is spilled upon the hands or clothes it should be washed off immediately, using plenty of water. It is advisable to have a bottle of ammonia water at hand with which to saturate spots where acid has been spattered upon clothes, as this will in most cases restore the color and preserve the fabric.

*Boiling water* should be provided for filling the bottles after they have been whirled for the first time, and for warming the contents of the bottles if the fat becomes too cold for reading. Distilled rain water is to be preferred for filling the bottles, as hard water often causes bubbles to form upon the surface of the fat, which renders the reading difficult.

#### MAKING THE TEST.

*Sampling the Milk.*—Every precaution should be taken to have the sample represent as nearly as possible the whole lot of milk from which it is taken. Milk fresh from the cow, while still warm and before the cream has separated in a layer, may be thoroughly mixed by pouring three or four times from one vessel to another. Samples taken at once from milk mixed in this way are the most satisfactory of any. Milk that has stood until a layer of cream has formed should be poured more times, until the cream is thoroughly broken up and the whole appears homogeneous. No clots of cream should appear upon the surface when the milk is left quiet for a moment. With proper care any milk that has not coagulated or that has not been exposed to the air until the surface of the cream has become dried, may be mixed so that a representative sample can be taken. Milk should not be poured more times than is necessary, as extended mixing in this way is liable to churn the cream, forming little granules of butter that quickly rise to the surface. When this occurs it is impossible to obtain a fair sample and it is useless to make an examination. Milk is sometimes churned by being transported long distances in vessels that are not full.

It is impracticable to sample a large amount of sour milk, but a small sample of a pint to a quart may be thoroughly mixed by adding five per cent. by volume, of strong ammonia water which will dissolve the curd and permit a uniform mixture being made. When ammonia is added the final results should be increased by five per

Fig. B.



st purchased, and the acid not being absorbs moisture from kept in a tightly ber, as a common

but which, owing to or three lots of

cent. Sour milk may also be treated with concentrated lye in the manner described for making composite tests, page 239. Samples from sour milk are, however, never as satisfactory as those taken when the milk is in proper condition

#### SAMPLING MILK IN FACTORIES.

One of the chief obstacles to the introduction of the system of paying for milk according to its value, as shown by the amount of fat which it contains, has been the fear that representative samples of each patron's milk could not be obtained at the factory without much trouble and expense. Experience has shown, however, that this fear is ungrounded and that any person competent to weigh the milk and keep the necessary records, can take fair samples of each lot of milk received. This may be accomplished in several ways, one of the following being recommended: By stirring the milk with a long handled dipper after it has been poured into the weigh can and dipping out a small portion from which the test sample is measured, or by inserting a small tube in the bottom of the conductor pipe, through which a small portion of the milk continually escapes and is caught in a vessel placed to receive it. The same end may be attained by laying a small tube in the bottom of the conductor pipe, having it project a foot or more beyond the end, and placing a small vessel to receive the portion of milk which runs through the tube. Samples may also be taken with the "milk thief," which is a tube with the valve at the lower end, that is lowered into the milk in the weigh can, taking a column of milk from the top to the bottom of the can. A representative sample may be taken by any of these methods, but my preference is for the first three named.

When milk is delivered at the factory only every other day, the cream often becomes so firm that clots of it quickly rise to the surface after the milk is poured into the weigh can. Such milk is difficult to sample, the result of the test usually being too low. I believe the most satisfactory sample will be obtained in such cases by mixing the samples in the weigh can with a dipper, taking out a small portion which may be poured from one vessel to another until the clots disappear, after which the test samples should be measured. The best practice is to have the test bottles arranged in a case convenient to the weigh can and to measure the test samples directly into the bottles as the milk is received.

*Measuring the Milk.*—When the milk has been sufficiently mixed, the milk pipette is filled by placing its lower end in the milk and sucking at the upper end until the milk rises above the mark on the stem; then remove the pipette from the mouth and quickly close the tube at the upper end by firmly pressing the end of the index finger upon it to prevent access of air. So long as this is done the milk cannot flow from the pipette. Holding the pipette in a perpendicular position, with the mark on a level with the eye, carefully relieve the pressure on the finger so as to admit air slowly to the space above the milk. In order to more easily control the access of air both the finger and end of the pipette should be dry. When the

upper surface of the milk should be removed from the mouth of one of the bottles. After waiting without clogging the bottle. After waiting to expel the milk he should when used it should taking the test sample the milk should be measured. Neglect results, through the rich.

Persons who have practiced a short time an analysis.

*Adding the acid.*—may be proceeded with without materially clogging the bottles two or three added, have given the measured. It is advised after the samples are curd should be broken

The volume of curd same as that of the added, the casein is no separation of the fat. The acid need not be affect the result.

When all of the acid measure is filled fully poured into the inclined position for being much heavier than mixing with the milk mixed together by precipitation of the curd amount of heat evolved colorless, soon changes and perhaps some other

upper surface of the milk coincides with the mark upon the stem, the pressure should be removed to stop the flow of milk. Next, place the point of the pipette in the mouth of one of the test bottles, held in a slightly inclined position so that the milk will flow down the side of the tube leaving a space for the air to escape without clogging the neck, and remove the finger, allowing the milk to flow into the bottle. After waiting a short time for the pipette to drain, blow into the upper end to expel the milk held by capillary attraction in the point. If the pipette is not dry when used it should be filled with the milk to be tested, and this thrown away before taking the test sample. If several samples of the same milk are taken for comparison, the milk should be poured once from one vessel to another after each sample is measured. Neglect of this precaution may make a perceptible difference in the results, through the separation of cream, especially when the milk examined is rich.

Persons who have had no experience in the use of the pipette will do well to practice a short time by measuring water into a test bottle before attempting to make an analysis.

*Adding the acid.*—After the milk has been measured into the test bottle the test may be proceeded with immediately, or the bottles may be left for a day or two without materially changing the results; samples that have remained in the test bottles two or three weeks and which had commenced to mould before the acid was added, have given the same amount of fat as samples tested immediately after being measured. It is advisable, however, that the test be proceeded with immediately after the samples are measured, if possible. If the milk has become coagulated, the curd should be broken up by shaking the test bottle before the acid is added.

The volume of commercial sulphuric acid required for a test is approximately the same as that of the milk, or 17.5 c. c. for the ordinary test. If too little acid is added, the casein is not all held in solution throughout the test, and an imperfect separation of the fat results. If too much acid is added, the fat itself is attacked. The acid need not be measured with great accuracy, as small variations will not affect the result.

When all of the samples of milk to be tested are measured ready for the test, the acid measure is filled to the 17.5 c. c. mark with sulphuric acid, and from this it is carefully poured into the test bottle, containing the milk, that is held in a slightly inclined position for reasons given in directions for measuring the milk. The acid being much heavier than milk sinks directly to the bottom of the test bottle without mixing with the milk that floats upon it. The acid and milk should be thoroughly mixed together by gently shaking with a rotary motion. At first there is a precipitation of the curd from the milk, but this rapidly dissolves. There is a large amount of heat evolved by the chemical action, and the solution, at first nearly colorless, soon changes to a very dark brown, owing to the charring of the milk sugar and perhaps some other constituents of the milk.



*Whirling the bottles.*—The test bottles containing the mixture of milk and acid should be placed in the machine and whirled directly after the acid is added. An even number of bottles should be whirled at the same time, and they should be placed in the wheel in pairs opposite to each other, so that the equilibrium of the apparatus will not be disturbed. When all the test bottles are put in the apparatus, the cover is placed upon the jacket, and the machine turned at the proper speed for about five minutes. The test should never be made without the cover being placed upon the jacket, as this not only prevents the cooling of the bottles when they are whirled, but in case of the breakage of bottles may protect the face and eyes of the operator from injury by piece of glass or hot acid. The machine should be frequently examined to make certain that there is no slipping of belts or frictional bearings which may cause too slow motion and result in an imperfect separation of the fat. Managed in this way no extra heat is required, as that caused by the chemical action is sufficient to keep the fat liquid. If the bottles have stood, after the acid is added, until the contents are cooled below 100° F., they should be warmed to about 200° F. before whirling, by placing them in hot water.

*Filling the bottles with hot water.*—As soon as the bottles have been sufficiently whirled, they should be filled with hot water to about the seven per cent. mark. If practicable, distilled or rain water should be used for the purpose. The bottles are most conveniently filled by placing a vessel containing boiling water above the machine, and by means of a syphon made from a small rubber tube with a glass tip, the water is run directly into the bottles without removing them from the wheel. The flow of water can be perfectly controlled by a pinch-cock upon the rubber tube. If only a few tests are to be made, the bottles may be easily filled with a pipette, or by pouring from a graduate. The cover should then be replaced and the machine turned for about one minute, after which the fat should be measured.

If, when managed in this way, clots of curd or other matter are mingled with the fat, making the reading uncertain, the difficulty can usually be avoided by adding the hot water in two portions, filling the bottle at first only to the neck and after whirling for about one minute, adding sufficient hot water to bring the fat into the graduated neck, after which the bottle should be whirled and the fat measured.

*Measuring the fat.*—The fat when measured should be warm enough to flow readily, so that the line between the acid liquid and the column of fat will quickly assume a horizontal position when the bottle is removed from the machine. Any temperature between 100° F. and 150° F. will answer, but the higher temperature is to be preferred. The slight difference in the volume of fat due to this difference in temperature is not sufficient to materially affect results.

To measure the fat, take a bottle from its socket, and holding it in a perpendicular position with the scale on a level with the eye, observe the divisions which mark the highest and the lowest limits of the fat. The difference between these

give the percent. or one-tenth per cent.

The line of division, and no doubt the surface of the fat, place. The reading on the upper surface of the fat from surface of fat to bottom of the dark surface. For instance, from *a* to *b* and not

The reading measured the length of the dividers, one point on the other at the upper end removed and one point on the scale on the bottle fat in the milk extract.

Sometimes bubbles in the column of fat are removed by a few drops of strong alcohol on top of the tube to disperse and give a clear reading. When the reading should be taken at the same time, the alcohol par-

Whenever the fat is measured by allowing the bottle to stand, placing the bottles in

If the column of fat in skim milk, buttermilk, or cream, a layer across the tube will give sufficient accuracy by measuring the portion of milk in a

With all products containing fat, more accurate results are obtained, contains twice as much fat as amount of milk and acid may be read with gre-

give the percent. of fat directly. The reading can easily be taken to half divisions or one-tenth per cent.

The line of division between the fat and the liquid beneath is nearly a straight line, and no doubt need arise concerning the reading at this point, but the upper surface of the fat being concave, errors often occur by reading from the wrong place. The reading should be taken at the line where the upper surface of the fat meets the side of the tube and not from surface of fat in the centre of the tube, nor from the bottom of the dark line caused by the refraction of the curved surface. For instance, in Fig. 61 the reading should be taken from *a* to *b* and not to *c* or *d*.

The reading may be made with less liability of error by measuring the length of the column of fat with a pair of dividers, one point of which is placed at the bottom and the other at the upper limit of the fat. The dividers are then removed and one point being placed at the 0 mark of the scale on the bottle used, the other will be at the per cent. of fat in the milk examined.

Sometimes bubbles of air collect at the upper surface of the column of fat and prevent a close reading; in such cases a few drops of strong alcohol (over 90 per cent.) put into the tube on top of the column of fat, will cause the bubbles to disperse and give a sharp line between the fat and alcohol for the reading. Whenever alcohol is used for this purpose the reading should be taken directly after the alcohol is added, as after it has stood for a time, the alcohol partially unites with the fat and increases its volume.

Whenever the fat is not quite clear, more satisfactory results may be obtained by allowing the bottles to stand until the fat has crystalized and then warm them by placing the bottles in hot water, before taking the reading.

If the column of fat is less than about one division, as will often happen with skim milk, buttermilk or whey, it may assume a globular form instead of a uniform layer across the tube; when this occurs the fat can usually be estimated with sufficient accuracy by simple inspection, but in such cases it is better to take a double portion of milk in a large bottle.

#### TESTING SKIM-MILK, BUTTERMILK AND WHEY.

With all products like the above, which usually contain less than one per cent. of fat, more accurate results are obtained by the use of a special test bottle which contains twice as much as the ordinary test bottle. In such a bottle twice the usual amount of milk and acid can be taken, and the column of fat being doubled in length, may be read with greater accuracy. In this case the reading of the scale should be

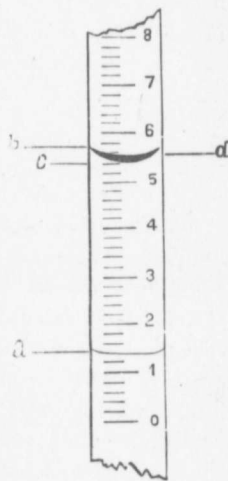


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weighing by correcting the scale reading as follows: For a scale reading of 20 per cent., add 0.25 per cent.; for a scale reading of 15 per cent., add 0.1 per cent. Readings between these may be corrected in proportion. Below 10 per cent. no correction is necessary.

Cream may be tested in the ordinary bottles in the manner proposed by Mr. Winton in bulletin 108 of the Connecticut Experimental Station, by using a pipette having a capacity of 6.04 c. c. which will deliver about 6 grams of average cream or one-third of the weight of the usual sample. When this pipette is used, about 12 c. c. of water should be added to the cream in the bottle before adding the acid. The usual amount of acid should be taken and the test completed in exactly the same way as with milk. The reading should be multiplied by three to obtain the per cent. of fat in the cream. No correction for the specific gravity is necessary when this pipette is used. With either of these modifications the test may, with advantage, replace the oil test churn in gathering cream factories.

#### CONDENSED MILK.

The estimation of fat in condensed milk is accomplished in exactly the same way as with cream. As a rule condensed milks are so thick that it is impracticable to measure the test sample directly with a pipette. This difficulty may be overcome by carefully diluting the milk with a known volume of water, making the analysis of this and correcting the result for the quantity of water added. The best method is to weigh the samples into a test bottle, taking about 8 grams, and after adding about 10 c. c. of water completing the test in the same manner as with milk, the per cent. of fat being obtained by multiplying the reading by 18 and dividing the product by the weight, in grams of the substance taken. The results are satisfactory.

#### CHEESE.

The examination of cheese is not as satisfactory as that of other dairy products. The chief reason for this is the unequal distribution of moisture and fat in the cheese, making it very difficult to obtain representative samples. On account of this, tests made from different parts of the same cheese, especially if it be very rich, often vary as much as two or three per cent. in the amount of fat found. To avoid this as much as possible, samples should be taken in a uniform manner. The following is the provisional method adopted by the Association of Official Agricultural Chemists at its last meeting<sup>1</sup>:

"Where the cheese can be cut, a narrow wedge reaching from the edge to the centre of the cheese will more nearly represent the average composition of the cheese than any other sample. This may be chopped quite fine, with care to avoid evaporation of water, and the portion for analysis taken from the mixed mass.

<sup>1</sup> Bulletin 35, U. S. Dept. of Agriculture, Division of Chemistry, 1892.

When the sample is taken with a cheese tryer, a plug, taken perpendicular to the surface, one-third of the distance from the edge to the centre of the cheese, should more nearly represent the average composition than any other. The plug should either reach entirely through or only half through the cheese. For inspection purposes the rind may be rejected, but for investigations, where the absolute quantity of fat in the cheese is required, the rind should be included in the sample. It is well when admissible, to take two or three plugs on different sides of the cheese, and, after splitting them lengthwise with a sharp knife, take portions of each for the test.

For the estimation of fat in cheese about 5 grams should be carefully weighed and transferred as completely as possible to a test bottle. From 12 to 15 c. c. of hot water is then added and the bottle shaken at intervals, keeping it warm, until the cheese has become softened, and converted into a creamy emulsion. This may be greatly facilitated by the addition of a few drops of strong ammonia to the contents of the bottle. After the contents of the bottles have become cold, the usual amount of acid should be added and the bottles shaken until the lumps of cheese have entirely dissolved. The bottles are then placed in the machine and whirled, the test being completed in the same manner as with milk. To obtain the per cent. of fat the reading should be multiplied by 18 and divided by the weight, in grams, of cheese taken.

#### THE COMPOSITE TEST.

Although it is quite generally admitted that the quality as well as quantity of milk delivered, should be considered in making dividends in factories where milk is pooled, many who recognize the justice of the relative value plan hesitate to adopt it on account of the labor and expense involved in making daily tests from each patron's milk. The best plan yet proposed for reducing the expense of the necessary tests is that described by Prof. Patrick.<sup>1</sup> This plan consists in putting a sample from each lot of milk which a patron delivers, successively, into a fruit jar, or other suitable vessel which can be tightly closed, and after a number of days, ascertain the average amount of fat in all of the milk delivered by the patron, for the time, considered by a single test of the composite sample. In order that the composite sample may truly represent the average of all the milk delivered by a patron, the daily sample should of course be in proportion to the amount of milk that he delivers each day. It has been found, however, in practice that scarcely any error is introduced when the daily samples are of uniform size. Prof. Patrick recommended that a small quantity of corrosive sublimate be placed in the jar in which the composite sample is kept, in order to prevent the souring of the milk and keep it in a condition which admits of a composite sample being taken for analysis. On account of the very

<sup>1</sup> Bulletin No. 9, of the Iowa Experimental Station.

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<sup>1</sup> Biederman's Centr

poisonous nature of sublimate, its use is to be discouraged if the same end can be attained by other means that are not dangerous.

Boracic acid, borax, and salicylic acid have each been used to advantage for preserving composite samples. None of these substances is entirely satisfactory as samples treated with them often become coagulated, especially in hot weather before the test is complete.

#### PRESERVING COMPOSITE SAMPLES WITH POTASSIUM BICHROMATE.

The discovery by Mr. J. A. Alen,<sup>1</sup> a Swedish chemist, that potassium bichromate will preserve milk from coagulation and in excellent condition for testing for a long time, offers the most satisfactory solution to this problem yet proposed. This salt, although poisonous, is not so violent a poison as corrosive sublimate and may be used with comparative little danger. On account of its bright orange color it is not likely to be mistaken for any other substance used in the dairy and the tint which it imparts to milk, without the addition of any other coloring matter, is so marked that there is no danger of milk that has been treated with it being used for domestic purposes.

The use of potassium bichromate for the preservation of composite samples of milk has been thoroughly tested with most satisfactory results by the students of the Wisconsin Dairy School during the past winter. Samples of milk have been kept in this way, in a warm room, for more than a month without being coagulated, and determinations of fat in these samples at frequent intervals, have shown no change in the amount of fat found. In all, 114 composite tests were made by this method. Each of these was made up of either four or six samples of milk, ranging from partly skimmed milk containing little fat to very rich milk, containing more than 6 per cent. of fat. The samples were kept in a warm room eight to ten days after the first portion was added and were without exception in good condition when the final test was made. All determinations of fat, both in the single and composite samples, were made in duplicate, the bottles containing the tests being shown to the inspector in charge and a written report of the test given to him each day. The final results are given below :

Average per cent. of fat in all single samples, 3.676.

Average per cent. of fat in all composite samples, 3.654.

Of the 114 trials there were only four in which the difference between the composite test and the average of the single tests exceeded two-tenths per cent., and in all of these the milk was partially churned by too much mixing, making it impossible to obtain a representative sample of the composite. Of the remaining 110 trials only ten gave differences larger than one-tenth per cent. fat and in forty trials the com-

<sup>1</sup> Biederman's Centralblatt für Agrikulturchemie, 1892, p. 549.



posite test agreed exactly with the average per cent of fat in the single tests. These results are far better than we have obtained by any other method and I believe warrant its adoption in factories.

In making tests on this plan a pint or quart fruit jar should be provided for each patron. Into each of these jars should be placed from  $\frac{1}{4}$  to  $\frac{1}{2}$  gram of powdered potassium bichromate. This need not be weighed as the amount can vary considerably without affecting results. The amount specified is about one half as much as would lie upon a cent, or as much as can be taken upon a pen knife blade one inch long. This will be sufficient to preserve from a pint to a quart a week. A little experience will teach one how much to use; enough should be used to tint the whole a light straw color and it should be perfectly liquid when the final test is made; if this is not the case more should be used.

Each jar is labelled or numbered to designate the patron to whom it belongs and into it is placed a measured sample of his milk each day until the test is made.

A small tin cylinder holding from one to two ounces of milk when filled to the brim makes a convenient measure for this purpose. Whenever a fresh sample of milk is placed in the jar it should be mixed with the milk previously added by giving the jar a rotary motion; unless this is done the cream which separates may adhere tenaciously to the sides of the jar and prevent the taking of an accurate sample when the test is made. The jars should be tightly closed after each sample of milk has been added, and should be kept in a cool place during the week.

If kept too warm, the cream will become so hard that it cannot be mixed without danger of churning, which will always lead to low results. The test of the composite sample is made in exactly the same way as with fresh milk.

This method of preserving composite samples has been patented by Mr. Allen in Sweden, but so far as I knew no restrictions are placed upon its use in this country.

#### OTHER METHODS OF MAKING COMPOSITE TESTS.

Prof. Farrington,<sup>1</sup> Chemist of the Illinois Agricultural Experiment Station, has recommended that the daily samples be placed in jars as described above and that nothing be added to prevent them souring. When ready for the test, about one-half a teaspoonful of finely powdered concentrated lye is added, in small portions at a time to each jar, which should be shaken occasionally, or pouring from one jar to another, until the curdled milk has all dissolved and the cream become mingled with the milk. Solution may be hastened by warming the contents of the jar to a little over 100° F. The temperature should not exceed 140° F., and the covers should be kept upon the jars when warm, to prevent evaporation. When the milk in the jars has become thin and homogeneous a sample may be measured and tested for fat in exactly the same way as with new milk, the result being the average per cent. of fat in the

<sup>1</sup> Bulletin No. 16, Ill., Agr. Expt. Station 1891, p. 510.

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milk delivered, for the period covered by the samples. Tests of this kind should not extend over a longer period than one week.

A very satisfactory composite test may be made, without the trouble of dissolving the curd, by using a test bottle of twice the usual size, such as is recommended for skim-milk, for each patron, and measuring into this with a 5 c. c. pipette a sample of his milk each day for seven days. The bottle will then contain double the usual test sample, and by adding double the usual amount of acid the test may be completed as with fresh milk. It is well to shake up the contents of the bottle before adding the acid. The reading should be divided by two for the per cent. of fat. A composite test for three days can be obtained in this way in the ordinary test bottles by using a pipette containing 5.9 c. c., making the test in just the same way as with fresh milk.

The objections to this method are that more care is required in taking the daily samples, and in case of an accident in making the test, the record for the time covered by the composite sample is lost. The result is accurate and the time required less than by any other method.

#### THE "RELATIVE VALUE PLAN" OF MAKING DIVIDENDS IN FACTORIES.

This system assumes that the relative value of all milks that are pooled together for either butter or cheese are in direct proportion to the amount of fat which the milks contain. The method is applied in co-operative factories by dividing the net proceeds between the different patrons, in proportion to the total amount of fat which the milk delivered by each patron contains, for the time covered by the dividend. In factories where milk is purchased, a price is agreed upon for milk of a certain standard, say one dollar per 100 lbs. for milk containing 4 per cent. of fat, the price paid being greater or less than this in proportion as the per cent. of fat is above or below 4 per cent. The following example, showing the weight and quality of milk delivered by different patrons, with the weight of butter or cheese made and money received for it, will illustrate:

NAME OF PATRON.	Lbs. of Milk.	Per cent. of fat.	Fat, lbs.
A.....	2,000	3.25	65.
B.....	750	4.00	30.
C.....	1,275	5.2	66.3
D.....	1,500	3.6	54.
Total fat lbs.....			215.3

The total fat in each patron's milk is found by multiplying the number of pounds of milk by one hundredth of the per cent. of fat, thus :

$$2,000 \times .0325 = 65, \text{ the pounds of fat in A's milk.}$$

$$750 \times .04 = 30, \text{ the pounds of fat in B's milk, etc.}$$

From the pooled milk the yield of butter was 240 pounds, which was sold for twenty-five cents per pounds, making \$60 in all. The cost of making, including freight, etc., was four cents per pound, or \$9.60, which deducted from the gross sales leave \$50.40 to be divided between A, B, C and D in proportion to the fat which each had delivered to the factory. Dividing the net sum of \$50.40 by 215.3, the total pounds of fat received, give \$.23409 per pound for the fat. Multiplying the pounds of fat in each patron's milk by the price per pound gives the amount which each receives.

NAME OF PATRON.	—	Amount which each receives.
A.....	65 × .23409 =	\$15.216
B.....	30 × .23409 =	7.023
C.....	66.3 × .23409 =	15.520
D.....	54 × .23409 =	12.641
Total.....	.....	\$50.400

If the above milk was made into cheese, the yield being 570 lbs., which sold for \$0.10½ per lb., the cost of making, selling, freight, etc., being 1½ cents per lb., there would be \$51.30 to divide. This for the 215.3 lbs. fat is \$.23827 per lb., giving each patron as below :

PATRON.	—	Amount which each receives.
A.....	65 × .23827 =	\$15.488
B.....	30 × .23827 =	7.148
C.....	66.3 × .23827 =	15.797
D.....	54 × .23827 =	12.867
Total.....	.....	\$51.300

If this milk  
cent. milk, this w  
would have receiv

A.....  
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C.....  
D.....

When the cor  
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As this report  
from Prof. E. H. Fa  
the Dairy Tests at t  
in regard to testing  
be read with interes

DR. S. M. BABCOCK,  
Madison,

My Dear Sir,—

In reply to your r  
manipulations in the B  
These observations  
of the seventy-five cow  
Since May 1st, '93,  
During this time sampl  
variations in the compo



If this milk had been purchased at the rate of \$1.00 per 100 lbs. for four per cent. milk, this would have been at the rate of \$.25 per lb. for fat and each patron would have received :

PATRON.		Amount which each receives.
A.....	65 × .25 =	\$16.24
B.....	30 × .25 =	7.50
C.....	66.3 × .25 =	16.575
D.....	54 × .25 =	13.50
		\$53.825

When the composite test is used the time represented in the above example is one week, or whatever time is included in the test, the pounds of milk being the total for the period and the per cent. of fat the average as shown by the test. If more than one period is covered the fat is calculated for each separately and all added together for the total fat, instead of calculating it from the total pounds of milk and average of the different per cents. of fat. If daily tests are made the fat in each patron's milk should be calculated each day, the sum for the whole period covered by the sale being the total fat upon which the dividend is made.

As this report is going through the press. the following letter was received from Prof. E. H. Farrington, who has charge of the chemical work connected with the Dairy Tests at the World's Columbian Exposition; it gives additional precautions in regard to testing milk by the method described in the preceding pages, and will be read with interest and profit :

CHEMICAL LABORATORY OF THE WORLD'S  
COLUMBIAN EXPOSITION DAIRY TEST,  
JACKSON PARK, CHICAGO, Ill., August 1, '93. }

DR. S. M. BABCOCK,  
Madison, Wis.

*My Dear Sir,—*

In reply to your request I venture to make a few suggestions in regard to some of the manipulations in the Babcock Milk Test.

These observations are the results of a great many experiments made with the milk of each of the seventy-five cows now in the dairy test at the World's Columbian Exposition.

Since May 1st, '93, we have made at least one hundred and fifty tests of milk every day. During this time samples have been tested of a great variety of milks. There have been great variations in the composition of these milks and in the characteristics and health of the cows.

number of pounds

which was sold for  
making, including  
in the gross sales  
of the fat which  
to the fat which  
10 by 215.3, the  
Multiplying the  
the amount which

Amount which each receives.

\$15.216

7.023

15.520

12.641

\$50.400

which sold for  
ts per lb., there  
lb., giving each

Amount which each receives.

\$15.488

7.148

15.797

12.867

\$51.300

We have been able to test successfully any milk yet received, and by proper manipulation, to get a very clear separation of the fat.

A bad separation of fat is not always caused by the strength of the sulphuric acid.

Our work has demonstrated that by slight changes in the manipulation at least three kinds of tests can be made of one sample of milk with the same acid.

*First.*—A test giving a very clear separation of fat.

*Second.*—A separation of fat which contains more or less of a black, flocculent substance, especially at the bottom of the fat column, and

*Third.*—A test very much like the second except that a white instead of a black substance interferes with a clear measurement of the fat.

The black substance that appears is probably charred fat and indicates too strong an action of the acid on the milk. The adulteration of the fat shows either too weak a reaction or an incomplete separation by the centrifuge. Each of these two defects can of course be produced by acid either very much too strong or too weak. They can also be caused by different manipulation when acid having the correct strength is used.

If the acid is so poured into the milk in the test bottle that it passes through the milk, instead of running down the inside wall of the test bottle, a portion of the milk is thus acted on by the strong acid before it becomes diluted with the water in the milk. This makes a more intense action of the acid on a small part of the milk, and the fat it contains is somewhat decomposed and blackened. This black substance is then separated with the fat by the usual process of finishing the test and makes the measurement of the fat uncertain.

Another cause of the "black stuff" in the fat is too warm milk.

Sulphuric acid sp. gr. 1.82 may work all right for testing milk when both acid and milk are at a temperature of 60° Fahr., but if the weather changes or the testing is made in a warm room where the temperature is up to 80° or 90° F., a great deal of black stuff will be found in the fat.

The action of the acid on the milk will be more or less intense according to the temperature of the liquids.

Persons who have tested milk throughout the year at creameries or other places, may have noticed that in winter the fat is often light colored or whitish, while in summer it is a deep yellow. This is caused by the difference in the temperature of the milk and acid as well as by the strength of the acid.

Cooling the milk before adding acid to the bottle will often prevent the formation of the black substance which appears in the column of fat.

The white "curdy" substance that sometimes separates with the fat, can be destroyed, either by adding the hot water necessary to bring the fat up into the neck of the test bottle, in two portions and whirling the test bottles in the centrifuge after each addition of water, or by warming the milk in the test bottles so that it will be about 80° Fahr. when the acid is added.

It is my opinion that any person who has trouble from either the black or white substance separating with the fat, can remedy the difficulty by some changes in the manipulation provided the acid is anywhere between 1.82 and 1.83 sp. gr. No exact experiments have been made yet to determine the relation between the temperature of the milk and the sp. gr. of the acid, but I venture to guarantee an entirely satisfactory working of the Babcock milk test, if in addition to the elaborate detail you have already worked out, the following precautions are observed:

*First.*—An acid having sp. gr. 1.82 should be used with milk at 60° to 70° Fahr. If the acid is stronger cool the milk to a lower temperature. Somewhat weaker acid can probably be made to work all right by warming the milk.

*Second.*—When measuring the acid into the test bottle, hold the bottle at an angle that will

cause the acid to fall  
milk in the centre  
layer of milk and a

*Third.*—Thorough  
A better separation  
liquids to stand un

*Fourth.*—After fill  
the test bottle is filled  
the test bottle with  
hot water in two por  
test bottles are finally  
and the per cent. of f

*Fifth.*—Too low  
The machines have  
designed by the man

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water reduces the p  
amount of water add  
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only 2 per cent. of f  
cent. If, on the othe  
fat to 2 per cent., the  
easy to detect either  
can be obtained; as i  
it is best when practi

cause the acid to follow the inside walls to the bottom of the bottle and not drop through the milk in the centre of the bottle. If properly poured into the test bottle there will be a distinct layer of milk and acid with no black color between them.

*Third.*—Thoroughly mix the milk and acid as soon as measured into the test bottle. A better separation of fat is obtained by mixing at once rather than by allowing the two liquids to stand unmixed, until enough tests have been measured out to fill the centrifuge.

*Fourth.*—After five minutes whirling of the test bottle in the centrifuge, add hot water until the test bottle is filled up to the neck only; run the centrifuge one minute, then fill the neck of the test bottle with hot water and run the centrifuge another minute. Adding the necessary hot water in two portions is often a great help in getting a clear separation of fat. When the test bottles are finally taken from the centrifuge, they are put into hot water 140° to 160° Fahr. and the per cent. of fat read at that temperature.

*Fifth.*—Too low results will be obtained if the centrifuge does not have sufficient speed. The machines have to be watched, as constant use wears some of them so that the speed designed by the manufacturer is not obtained.

Very respectfully yours,

F. H. FARRINGTON.

#### DETECTION OF ADULTERATIONS IN MILK.

S. M. BABCOCK.

The most usual adulterations of milk are the addition of water and the abstraction of fat. Those factorymen and dealers who pay for milk according to its quality, as recommended in this bulletin, need have no fears of either of these adulterations, as the system makes it the interest of every man to supply as good milk as possible. As there are, however, many factories that still cling to the old method of paying the same price for all milks independent of their quality, it is thought advisable to describe the methods by which said frauds may be detected.

The detection of these adulterations is rendered possible by the fact that the abstraction of cream reduces the per cent. of fat, and slightly increases the per cent. of solids not fat, in the milk which remains. On the other hand, the addition of water reduces the per cent. of butter fat and solids not fat, in proportion to the amount of water added. For example: If a milk, which originally tested 4 per cent. of fat and 9 per cent. of solids, not fat be skimmed so that the remaining milk tests only 2 per cent. of fat, the solids not fat in the skimmed milk would be about 9.2 per cent. If, on the other hand, enough water has been added to this milk to reduce the fat to 2 per cent., the solids not fat would have been only 4.5 per cent. It is therefore easy to detect either or both of these adulterations, if a sample of the original milk can be obtained; as it is rarely possible in suspected cases to obtain original samples, it is best when practicable, to secure through an authorized agent, who sees the cows





## THE LACTOMETER.

There are several kinds of lactometers in use at the present time, all of which have the same general form, viz.: a narrow stem to which is attached an elongated bulb weight at the bottom so as to float in an upright position in milk, with the stem partially submerged. (See Fig. 6.) The depth to which the lactometer sinks depends upon the specific gravity of the liquid in which it is placed, a heavy liquid causing the stem to rise higher above the surface than a light liquid. It shows the relative weight of equal volumes of milk tested.

The lactometer most generally used in this country is graduated from 0 to 120 degrees, 0 being the point on the stem, to which the instrument sinks in pure water at 60° F. and 100 the point to which it sinks in a liquid having a specific gravity of 1.029, this being assumed to be the lowest specific gravity compatible with pure milk. The intermediate readings are intended to show the per cent. of milk having a specific gravity of 1.029, which the sample examined contains. This, however, it does not do, for when milk is skimmed it will give a higher reading upon the lactometer than it did before the cream was removed and the addition of cream to milk reduces the reading in the same way as the addition of water. Although an experienced person would rarely if ever be deceived by these readings, owing to the changed appearance of milk that has been skimmed or watered, factory-men and others have often been misled by them. For this reason, and also because it is necessary to know the specific gravity of milk, when the readings are to be used, in connection with the per cent. of fat, for the calculation of total solids, the Quevenne lactometer (see Fig. 6) is to be preferred. The scale of this lactometer expresses in thousandths the difference between the specific gravity of the liquid tested and water, the specific gravity of the water being 1. In other words, the reading of this lactometer is equal to the specific gravity of the milk in which it is placed, less 1 multiplied by 1,000. To illustrate: milk having a specific gravity of 1.0325 would give with this lactometer a reading of 32.5 and a reading of 33 on this lactometer, correspond to a specific gravity of 1.033. It is therefore easy to convert lactometer degrees into specific gravity and specific gravity into lactometer degrees. These lactometers are usually graduated from 15 to 40 degrees; if the scale were extended 0, this would be found at that point on the stem to which the instrument sinks in pure water at a temperature of 60° F. The 0 points of both the lactometers mentioned correspond. The scale of the ordinary lactometer may be converted into the Quevenne scale by multiplying by .29. For convenience, a table is given showing the relation between the two scales. The Quevenne readings are given to the nearest tenth.



Fig. 6.

The Quevenne

TABLE SHOWING THE QUEVENNE LACTOMETER DEGREES CORRESPONDING TO THE SCALE OF THE ORDINARY LACTOMETERS THAT ARE GRADUATED FROM 0 TO 120.

Ordinary Scale.	Quevenne Scale.	Ordinary Scale.	Quevenne Scale.
60	17.4	91	26.4
61	17.7	92	26.7
62	18.	93	27.0
63	18.3	94	27.3
64	18.6	95	27.6
65	18.8	96	27.8
66	19.1	97	28.1
67	19.4	98	28.4
68	19.7	99	28.7
69	20.	100	29.
70	20.3	101	29.3
71	20.6	102	29.6
72	20.9	103	29.9
73	21.2	104	30.2
74	21.5	105	30.5
75	21.7	106	30.7
76	22.	107	31.
77	22.3	108	31.3
78	22.6	109	31.6
79	22.9	110	31.9
80	23.2	111	32.2
81	23.5	112	32.5
82	23.8	113	32.8
83	24.1	114	33.1
84	24.4	115	33.4
85	24.6	116	33.6
86	24.9	117	33.9
87	25.2	118	34.2
88	25.5	119	34.5
89	25.8	120	34.8
90	26.1		

The sensitiveness of a lactometer depends upon the relation between the volume of the bulb and the diameter of the stem, a large bulb and small stem being most sensitive. A bulb  $1\frac{1}{2}$  inch in diameter and 3 inches long with a stem about  $\frac{1}{4}$  inch in diameter gives suitable proportions for a dairy lactometer. It is advisable to have the instrument combined with the thermometer, and when this is done it is more convenient to have the thermometer scale placed above the lactometer scale, so that both scales can be read without removing the lactometer from the milk.

#### CORRECTIONS FOR TEMPERATURE.

Although it is always advisable to have the temperature of the milk carefully adjusted to 60° F., when the lactometer reading is taken, corrections for the Quevenne lactometer may be made, for slight deviations (not more than 10°) from the standard temperature, without serious error, by adding to the lactometer reading 0.1 for each

degree that the temperature is above 60° F. For example, the lactometer reading is 30.0 at 56° F., the corrected reading is 30.0 + 0.4 = 30.4.

Having obtained the corrected reading, any accurate method of determining the specific gravity of the milk may be used, using the following table which gives the correction to be applied to the reading in which S = Specific Gravity.

in which S = Specific Gravity.

The table gives the correction to be applied to the readings (1000 specific gravity) for each degree above or below 60° F. six per cent.

<sup>1</sup> See 8th Annual Report.



degree that the temperature exceeds 60 and subtracting 0.1 for each degree below 60. For example, the lactometer reading is 33.5 and the temperature of the milk is 67° F. The corrected reading for 60° would be  $33.5 + .7 = 34.2$ . Had the temperature been 56° F., the corrected reading would be  $33.5 - .4 = 33.1$ .

Having obtained the per cent. of fat and specific gravity by the above method, or any accurate method, the solids not fat may be obtained by reference to the accompanying table which is calculated from the following formula.<sup>1</sup>

$$\text{Solids not fat} = \left\{ \frac{100 S - Sf}{100 - 1.0753 Sf} - 1 \right\} \times (100 - f) 2.6$$

in which S=Specific gravity of milk at 60° F. and f=per cent of fat.

The table gives per cents. of solids not fat corresponding to Quevenne lactometer readings (1000 sp. gr.—1000) from 17 to 40 and for each tenth per cent. of fat up to six per cent.

<sup>1</sup> See 8th Annual Report of Wisconsin Agricultural Expt. Station, p. 293.

Quevenne Scale.

26.4  
26.7  
27.0  
27.3  
27.6  
27.8  
28.1  
28.4  
28.7  
29.  
29.3  
29.6  
29.9  
30.2  
30.5  
30.7  
31.  
31.3  
31.6  
31.9  
32.2  
32.5  
32.8  
33.1  
33.4  
33.6  
33.9  
34.2  
34.5  
34.8

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TABLE SHOWING PER CENT. OF SOLIDS NOT FAT CORRESPONDING TO PER CENT. OF FAT AND QUEVENNE LACTOMETER READING.

Lacto- meter reading	PER CENT. OF FAT.																				Lacto- meter reading	
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9		2.0
17	4.42	4.44	4.46	4.48	4.50	4.52	4.54	4.56	4.58	4.60	4.62	4.64	4.66	4.68	4.70	4.73	4.75	4.77	4.79	4.81	4.83	17
18	4.68	4.70	4.72	4.74	4.76	4.78	4.80	4.82	4.84	4.86	4.88	4.90	4.92	4.95	4.97	4.99	5.01	5.03	5.05	5.07	5.09	18
19	4.94	4.96	4.98	5.00	5.02	5.04	5.06	5.08	5.10	5.12	5.14	5.17	5.19	5.21	5.23	5.25	5.27	5.29	5.31	5.33	5.35	19
20	5.20	5.22	5.24	5.26	5.28	5.30	5.32	5.34	5.36	5.38	5.40	5.43	5.45	5.47	5.49	5.51	5.53	5.55	5.57	5.59	5.61	20
21	5.46	5.48	5.50	5.52	5.54	5.56	5.58	5.60	5.62	5.64	5.66	5.68	5.71	5.73	5.75	5.77	5.79	5.81	5.83	5.85	5.87	21
22	5.72	5.74	5.76	5.78	5.80	5.82	5.84	5.86	5.88	5.90	5.93	5.95	5.97	5.99	6.01	6.03	6.05	6.07	6.09	6.11	6.13	22
23	5.98	6.00	6.02	6.04	6.06	6.08	6.10	6.12	6.14	6.17	6.19	6.21	6.23	6.25	6.27	6.29	6.31	6.33	6.35	6.37	6.39	23
24	6.24	6.26	6.28	6.30	6.32	6.34	6.36	6.38	6.40	6.43	6.45	6.47	6.49	6.51	6.53	6.55	6.57	6.61	6.63	6.65	6.67	24
25	6.50	6.52	6.54	6.56	6.58	6.60	6.62	6.64	6.67	6.69	6.71	6.73	6.75	6.77	6.79	6.81	6.83	6.85	6.87	6.90	6.92	25
26	6.76	6.78	6.80	6.82	6.84	6.86	6.88	6.91	6.93	6.95	6.97	6.99	7.01	7.03	7.05	7.07	7.09	7.11	7.14	7.16	7.18	26
27	7.02	7.04	7.06	7.08	7.10	7.12	7.14	7.17	7.19	7.21	7.23	7.25	7.27	7.29	7.31	7.33	7.35	7.38	7.40	7.42	7.44	27
28	7.28	7.30	7.32	7.34	7.36	7.38	7.40	7.43	7.45	7.47	7.49	7.51	7.53	7.55	7.57	7.59	7.61	7.64	7.66	7.68	7.70	28
29	7.54	7.56	7.58	7.60	7.62	7.64	7.66	7.69	7.71	7.73	7.75	7.77	7.79	7.81	7.73	7.85	7.88	7.90	7.92	7.94	7.96	29
30	7.80	7.82	7.84	7.86	7.88	7.90	7.93	7.95	7.97	7.99	8.01	8.03	8.05	8.07	8.09	8.12	8.14	8.16	8.18	8.20	8.22	30
31	8.06	8.08	8.10	8.12	8.14	8.16	8.19	8.21	8.23	8.25	8.27	8.29	8.31	8.33	8.36	8.38	8.40	8.42	8.44	8.46	8.48	31
32	8.32	8.34	8.36	8.38	8.40	8.42	8.45	8.47	8.49	8.51	8.53	8.55	8.57	8.59	8.62	8.64	8.66	8.68	8.70	8.72	8.74	32
33	8.58	8.60	8.62	8.64	8.66	8.68	8.71	8.73	8.75	8.77	8.79	8.81	8.83	8.85	8.88	8.90	8.92	8.94	8.96	8.98	9.01	33
34	8.84	8.86	8.88	8.90	8.92	8.95	8.97	8.99	9.01	9.03	9.05	9.07	9.09	9.12	9.14	9.16	9.18	9.20	9.22	9.24	9.27	34
35	9.10	9.12	9.14	9.16	9.18	9.21	9.23	9.25	9.27	9.29	9.31	9.33	9.35	9.38	9.40	9.42	9.44	9.46	9.48	9.51	9.53	35
36	9.36	9.38	9.40	9.42	9.44	9.47	9.49	9.51	9.53	9.55	9.57	9.59	9.62	9.64	9.66	9.68	9.70	9.72	9.75	9.77	9.79	36
37	9.62	9.64	9.66	9.68	9.70	9.73	9.75	9.77	9.79	9.81	9.83	9.85	9.88	9.90	9.92	9.94	9.96	9.98	10.01	10.03	10.05	37
38	9.88	9.90	9.92	9.94	9.97	9.99	10.01	10.03	10.05	10.07	10.09	10.12	10.14	10.16	10.18	10.20	10.22	10.25	10.27	10.29	10.31	38
39	10.14	10.16	10.18	10.20	10.23	10.25	10.27	10.29	10.31	10.33	10.35	10.38	10.40	10.42	10.44	10.46	10.48	10.51	10.53	10.55	10.57	39
40	10.40	10.42	10.44	10.46	10.49	10.51	10.53	10.55	10.57	10.59	10.61	10.64	10.66	10.68	10.70	10.72	10.75	10.77	10.77	10.81	10.83	40

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TABLE SHOWING PER CENT. OF SOLIDS NOT FAT CORRESPONDING TO PER CENT. OF FAT AND QUEVENNE LACTOMETER READING. — *Continued.*

Lacto- meter reading	PER CENT. OF FAT.																				Lacto- meter reading	
	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9		4.0
41	10.60	10.62	10.64	10.66	10.68	10.70	10.72	10.74	10.76	10.78	10.80	10.82	10.84	10.86	10.88	10.90	10.92	10.94	10.96	10.98	11.00	41
42	10.80	10.82	10.84	10.86	10.88	10.90	10.92	10.94	10.96	10.98	11.00	11.02	11.04	11.06	11.08	11.10	11.12	11.14	11.16	11.18	11.20	42
43	11.00	11.02	11.04	11.06	11.08	11.10	11.12	11.14	11.16	11.18	11.20	11.22	11.24	11.26	11.28	11.30	11.32	11.34	11.36	11.38	11.40	43
44	11.20	11.22	11.24	11.26	11.28	11.30	11.32	11.34	11.36	11.38	11.40	11.42	11.44	11.46	11.48	11.50	11.52	11.54	11.56	11.58	11.60	44
45	11.40	11.42	11.44	11.46	11.48	11.50	11.52	11.54	11.56	11.58	11.60	11.62	11.64	11.66	11.68	11.70	11.72	11.74	11.76	11.78	11.80	45
46	11.60	11.62	11.64	11.66	11.68	11.70	11.72	11.74	11.76	11.78	11.80	11.82	11.84	11.86	11.88	11.90	11.92	11.94	11.96	11.98	12.00	46
47	11.80	11.82	11.84	11.86	11.88	11.90	11.92	11.94	11.96	11.98	12.00	12.02	12.04	12.06	12.08	12.10	12.12	12.14	12.16	12.18	12.20	47
48	12.00	12.02	12.04	12.06	12.08	12.10	12.12	12.14	12.16	12.18	12.20	12.22	12.24	12.26	12.28	12.30	12.32	12.34	12.36	12.38	12.40	48
49	12.20	12.22	12.24	12.26	12.28	12.30	12.32	12.34	12.36	12.38	12.40	12.42	12.44	12.46	12.48	12.50	12.52	12.54	12.56	12.58	12.60	49
50	12.40	12.42	12.44	12.46	12.48	12.50	12.52	12.54	12.56	12.58	12.60	12.62	12.64	12.66	12.68	12.70	12.72	12.74	12.76	12.78	12.80	50





TABLE SHOWING PER CENT. OF SOLIDS NOT FAT CORRESPONDING TO PER CENT. OF FAT AND QUEVENNE LACTOMETER READING. — *Continued.*

Lacto- meter reading	PER CENT. OF FAT.																Lacto- meter reading					
	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5		5.6	5.7	5.8	5.9	6.0
17	5.24	5.26	5.28	5.30	5.32	5.34	5.36	5.38	5.40	5.42	5.44	5.46	5.48	5.51	5.53	5.55	5.57	5.59	5.61	5.63	5.65	17
18	5.50	5.52	5.54	5.56	5.58	5.60	5.62	5.64	5.66	5.68	5.70	5.72	5.75	5.77	5.79	5.81	5.83	5.85	5.87	5.89	5.91	18
19	5.76	5.78	5.80	5.82	5.84	5.86	5.88	5.91	5.93	5.95	5.97	5.99	6.01	6.03	6.05	6.07	6.08	6.11	6.13	6.16	6.18	19
20	6.02	6.04	6.07	6.09	6.11	6.13	6.15	6.17	6.19	6.21	6.23	6.25	6.27	6.29	6.31	6.34	6.36	6.38	6.40	6.42	6.44	20
21	6.29	6.31	6.33	6.35	6.37	6.39	6.41	6.43	6.45	6.47	6.49	6.52	6.54	6.56	6.58	6.60	6.62	6.64	6.66	6.68	6.70	21
22	6.55	6.57	6.59	6.61	6.63	6.65	6.67	6.69	6.72	6.74	6.76	6.78	6.80	6.82	6.84	6.86	6.88	6.90	6.92	6.95	6.97	22
23	6.81	6.83	6.85	6.87	6.89	6.92	6.94	6.96	6.98	7.00	7.02	7.04	7.06	7.08	7.10	7.13	7.15	7.17	7.19	7.21	7.23	23
24	7.07	7.09	7.12	7.14	7.16	7.18	7.20	7.22	7.24	7.26	7.28	7.30	7.33	7.35	7.37	7.39	7.41	7.43	7.45	7.47	7.49	24
25	7.34	7.36	7.38	7.40	7.42	7.44	7.46	7.48	7.50	7.53	7.55	7.57	7.59	7.61	7.63	7.65	7.67	7.69	7.72	7.74	7.76	25
26	7.60	7.62	7.64	7.66	7.68	7.70	7.73	7.75	7.77	7.79	7.81	7.83	7.85	7.87	7.89	7.92	7.94	7.96	7.98	8.00	8.02	26
27	7.86	7.88	7.90	7.92	7.94	7.97	7.99	8.01	8.03	8.05	8.07	8.09	8.11	8.14	8.16	8.18	8.20	8.22	8.24	8.26	8.28	27
28	8.12	8.14	8.16	8.18	8.21	8.23	8.25	8.27	8.29	8.31	8.33	8.36	8.38	8.40	8.42	8.44	8.46	8.48	8.50	8.53	8.55	28
29	8.38	8.41	8.43	8.45	8.47	8.49	8.51	8.53	8.55	8.58	8.60	8.62	8.64	8.66	8.68	8.70	8.73	8.75	8.77	8.79	8.81	29
30	8.65	8.67	8.69	8.71	8.73	8.75	8.77	8.80	8.82	8.84	8.86	8.88	8.90	8.92	8.95	8.97	8.99	9.01	9.03	9.05	9.07	30
31	8.91	8.93	8.95	8.97	8.99	9.02	9.04	9.06	9.08	9.10	9.12	9.15	9.17	9.19	9.21	9.23	9.25	9.27	9.30	9.32	9.34	31
32	9.17	9.19	9.21	9.24	9.26	9.28	9.30	9.32	9.34	9.37	9.39	9.41	9.43	9.45	9.47	9.49	9.52	9.54	9.56	9.58	9.60	32
33	9.43	9.46	9.48	9.50	9.52	9.54	9.56	9.58	9.61	9.63	9.65	9.67	9.69	9.71	9.74	9.76	9.78	9.80	9.82	9.84	9.87	33
34	9.70	9.72	9.74	9.76	9.78	9.80	9.83	9.85	9.87	9.89	9.91	9.93	9.96	9.98	10.00	10.02	10.04	10.06	10.09	10.11	10.13	34
35	9.96	9.98	10.00	10.02	10.04	10.07	10.09	10.11	10.13	10.15	10.17	10.20	10.22	10.24	10.26	10.28	10.31	10.33	10.35	10.37	10.39	35
36	10.22	10.24	10.26	10.29	10.31	10.33	10.35	10.37	10.40	10.42	10.44	10.46	10.48	10.50	10.52	10.55	10.57	10.59	10.61	10.63	10.66	36
37	10.48	10.50	10.53	10.55	10.57	10.59	10.61	10.64	10.66	10.68	10.70	10.72	10.74	10.77	10.79	10.81	10.83	10.85	10.88	10.90	10.92	37
38	10.75	10.77	10.79	10.81	10.83	10.85	10.88	10.90	10.92	10.94	10.96	10.99	11.01	11.03	11.05	11.07	11.10	11.12	11.14	11.16	11.18	38
39	11.01	11.03	11.05	11.07	11.09	11.12	11.14	11.16	11.18	11.20	11.23	11.25	11.27	11.31	11.34	11.36	11.38	11.40	11.42	11.45	11.47	39
40	11.27	11.29	11.31	11.34	11.36	11.38	11.40	11.42	11.45	11.47	11.49	11.51	11.53	11.55	11.58	11.60	11.62	11.65	11.67	11.69	11.71	40

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The formula<sup>1</sup> is:

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<sup>1</sup>See 8th Annual Repo

To use the table find in the first vertical column the number corresponding to the Quevenne lactometer reading of the milk, and follow along the horizontal line in which this appears to the column headed with the per cent. of fat in the milk; the number common to both of these lines is the per cent. of solids not fat in the milk. To find the total solids add the per cent. of solids not fat, as found in the table, to the per cent. of fat.

A SIMPLE FORMULA FOR THE SOLIDS NOT FAT.

Among the numerous formulæ that have been proposed for the calculation of the solids of milk from the specific gravity and per cent. of fat, not one, that is sufficiently accurate for general use, is easily applied without tables, and I believe the limited use of such formulæ in this country may be attributed to this fact. This objection does not hold with the formula given below, as it is simple enough to be easily remembered and can be quickly applied without tables. At the same time the results obtained by it are, with normal milks containing not more than 6 per cent. fat, nearly as accurate as those by any other formula. For this reason I believe it is well adapted to the wants of dairymen and others who may wish to know more about the composition of milk than is expressed by the amount of fat. This formula has been used the past three winters by students in the Dairy School at the University of Wisconsin, and by it they have been enabled, in most cases, to detect the common adulterations of milk, such as the abstraction of fat or the addition of water.

The formula' is as follows:

$$\text{Solids not fat} = \frac{L + .7 f}{3.8} \text{ and}$$

$$\text{Total solids} = \frac{L + .7 f}{3.8} + f$$

in which L = Reading of Quevenne lactometer at 60° F. and f = per cent. of fat.

This formula agrees with the more general formula, by which the table is calculated, when applied to milks containing between 3 and 4 per cent. of fat. For milks containing less than 3 per cent. of fat the formula gives results a trifle too high, and for milks above 4 per cent. of fat a trifle too low; the error, however, will not amount to as much as .1 per cent. with any normal milk containing less than 6 per cent. of fat. If more accurate results are desired the solids not fat as found by this formula may be corrected as follows:

- For milks containing less than 1 pct. of fat subtract..... .09
- For milks containing from 1 to 2 pct. of fat subtract..... .06
- For milks containing from 2 to 3 pct. of fat subtract..... .03
- For milks containing from 3 to 4 pct. of fat.....no correction
- For milks containing from 4 to 5 pct. of fat add..... .03
- For milks containing from 5 to 6 pct. of fat add..... .06

<sup>1</sup>See 8th Annual Report Wisconsin Agricultural Expt. Station, p. 297.

36	10.22	10.24	10.26	10.28	10.31	10.33	10.35	10.37	10.39	10.42	10.44	10.46	10.48	10.50	10.52	10.55	10.57	10.59	10.61	10.63	10.66	
37	10.48	10.50	10.53	10.55	10.57	10.59	10.61	10.64	10.66	10.68	10.70	10.72	10.74	10.77	10.79	10.81	10.83	10.85	10.88	10.90	10.92	37
38	10.75	10.77	10.79	10.81	10.83	10.85	10.88	10.90	10.92	10.94	10.96	10.99	11.01	11.03	11.05	11.07	11.10	11.12	11.14	11.16	11.18	38
39	11.01	11.03	11.05	11.07	11.09	11.12	11.14	11.16	11.18	11.20	11.23	11.25	11.27	11.29	11.31	11.34	11.36	11.38	11.40	11.42	11.45	39
40	11.27	11.29	11.31	11.34	11.36	11.38	11.40	11.42	11.45	11.47	11.49	11.51	11.53	11.55	11.58	11.60	11.62	11.65	11.67	11.69	11.71	40

and so on, adding .03 to the solids not fat, as shown by the formula, for each per cent. of fat above 4 which the milk contains. Corrected in this way, the results will agree closely with those obtained by the general formula for milks, or for creams containing not more than 20 per cent. of fat.

For ordinary purposes no correction need be applied, as the errors of observation, in obtaining the necessary data, would generally be greater than those arising from defects in the formula.

This formula expressed in words gives the following rule for the calculation of solids not fat and of total solids, when the Quevenne lactometer reading and per cent. of fat are known :

Add the Quevenne lactometer reading at 60° F. to seven-tenths of the per cent. of fat and divide the sum by 3.8. The result will be the solids not fat, and this added to the per cent. of fat gives the per cent. of total solids.

The relations which exist in normal milks between the factors entering the last formula are such that the accuracy of the formula is but slightly affected by changing to the following :

$$\text{Solids not fat} = \frac{L + f}{4}$$

This simple expression gives results with average herd milks which do not vary much more than .1 from those obtained by the general formula given above, and is consequently well adapted for use in factories in making preliminary examinations for adulterations.

In general it may be stated that no milk is pure when the Quevenne lactometer reading added to the per cent. of fat does not exceed 32.

The amount of water which has been added to a known sample of milk may be calculated from the solids not fat by dividing the per cent. of solids not fat in the suspected milk by the per cent. of solids not fat in the original sample and multiplying the product by 100. The result will be the number of pounds of milk in 100 pounds of the milk examined. The difference between this and 100 will be the water added. *Example*: The solids not fat in a sample of milk equals 9 per cent., and after water had been added to the milk the solids not fat were only 7 per cent. Then

$$\frac{7}{9} \times 100 = 77.7 \text{ per cent. of milk in the watered sample, and } 100 - 77.7 = 22.3$$

per cent. of water. That is, 22.3 pounds of water had been added to 77.7 pounds of milk. When the solids not fat in the original milk are not known the legal standard may be taken for this calculation. In states where no legal standard is established, it may generally be assumed that milk containing less than 8.5 per cent. of solids not fat is watered. In all cases, however, when practicable, a sample of milk should be obtained at the farm and compared with the suspected sample.

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HOW TO OBTAIN THE APPARATUS DESCRIBED.

The apparatus and chemicals required for making the test for fat in milk may be obtained at the dairy supply stores throughout the country, and parties wishing any of these should apply to them. Sulphuric acid of a specific gravity of 1.82 to 1.83, and powdered bichromate of potassium used for composite tests, may also be obtained at any drug store.

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## EXPERIMENTAL RESEARCHES ON THE MANUFACTURE OF CHEDDAR CHEESE.

BY PROFESSOR VAN SLYKE

*Of the Agricultural experiment-Station of the State of New York.*

At pp. 122, 123, we mentioned these investigations and the permission we had received to publish some extracts from them. The Professor's letter is annexed :

Geneva, N. Y., Jan. 29 1894.

M. E. CASTEL,

St. Hyacinthe, Quebec.

*Dear Sir,*

You are very welcome to translate any passages of our bulletins that you may consider suitable to your report. I send you a complete collection of those relating to cheese making.

Very truly yours,

L. L. VAN SLYKE.

The results of the investigations carried on at the Geneva Station, relating to cheese-making, were published in the bulletins 37, 43, 45, 46, 47, 50, 54, 56, 60, 61, 65, 68 of that station.

From these, we extract the following information on the nature and importance of these researches :

Begun in September, 1891, by 9 preliminary experiments, 8 of which were made at the station and 1 at a cheesery, the researches were continued throughout the season of 1892, both at the station and at different cheeseries, were resumed at the station in February and March, 1893, by some additional experiments, and carried on during the season of 1893 in 50 cheeseries in the State of New York, scattered over 8 different counties.

These labours employed about a million pounds of milk, representing the average quality of more than 5 million pounds and the yield of more than fifteen thousand cows. They comprised more than 250 experiments in-cheese-making, 150 and more of which were conducted at cheese-factories. The total cheese made under these conditions was nearly 100,000 lbs.!

The analytical part of the researches involved, directly or indirectly, 11,500 determinations.

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3. Pounds of Cheese-

Season of 1892. . . . .  
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## I. POINTS INVESTIGATED.

## 1. The conditions of manufacture as found at factories.

## 2. The composition of normal factory milk in New York State.

- a.* Milk-solids; *b.* Fat; *c.* Casein; *d.* Albumen; *e.* Relation of fat to casein; *f.* Relation of casein to albumen.

## 3. The composition of whey.

## 4. The composition of green cheese.

- a.* Water; *b.* Fat; *c.* Casein; *d.* Relation of fat to casein; *e.* Relation of fat to other solids.

## 5. Loss of milk-constituents in cheese-making.

- a.* Solids; *b.* Fat; *c.* Casein and albumen.

## 5. Influence of composition of milk on composition of cheese.

- a.* Fat; *b.* Casein.

## 7. Influence of composition of milk on yield of cheese.

- a.* Fat; *b.* Casein.

## 8. Influence of advancing lactation and of season upon the composition of the milk, yield of cheese, etc., during the factory season.

## SUMMARY OF RESULTS.

1. The study of the *conditions of manufacture* does not yet allow of any very definite conclusions being drawn.

## 2. GENERAL SUMMARY OF RESULTS RELATING TO THE COMPOSITION OF NORMAL MILK.

## 1. Pounds of Total Solids in One Hundred Pounds of Milk.

	Least.	Greatest.	Average
Season of 1892.....	11.47	13.91	<b>12.64</b>
Season of 1893.....	11.70	13.87	<b>12.68</b>
Seasons of 1892 and 1893.....	11.47	13.91	<b>12.67</b>

## 2. Pounds of Solids not Fat in One Hundred Pounds of Milk.

	Least.	Greatest.	Average
Season of 1892.....	8.27	9.66	<b>8.94</b>
Season of 1893.....	8.40	9.55	<b>8.91</b>
Season of 1892 and 1893.....	8.27	9.66	<b>8.92</b>

## 3. Pounds of Cheese-Producing Solids (Fat and Casein) in One Hundred Pounds of Milk.

	Least.	Greatest.	Average.
Season of 1892.....	4.97	7.35	<b>6.16</b>
Season of 1893.....	5.48	7.44	<b>6.23</b>
Seasons of 1892 and 1893.....	4.97	7.44	<b>6.21</b>

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4. *Pounds of Whey-Solids (Albumen, Sugar, etc.) in One Hundred Pounds of Milk.*

	Least.	Greatest.	Average.
Season of 1892.....	6.11	7.03	<b>6.48</b>
Season of 1893.....	6.19	6.69	<b>6.45</b>
Seasons of 1892 and 1893.....	6.11	7.03	<b>6.46</b>

5. *Pounds of Fat in One Hundred Pounds of Milk.*

	Least.	Greatest.	Average.
Season of 1892.....	3.04	4.35	<b>3.69</b>
Season of 1893.....	3.33	4.60	<b>3.77</b>
Seasons of 1892 and 1893.....	3.04	4.60	<b>3.75</b>

6. *Pounds of Casein and Albumen in One Hundred Pounds of Milk.*

	Least.	Greatest.	Average.
Season of 1892.....	2.53	3.76	<b>3.13</b>
Season of 1893.....	2.75	3.60	<b>3.14</b>
Seasons of 1892 and 1893.....	2.53	3.76	<b>3.14</b>

7. *Pounds of Casein in One Hundred Pounds of Milk.*

	Least.	Greatest.	Average.
Season of 1892.....	1.93	3.00	<b>2.47</b>
Season of 1893.....	2.18	2.85	<b>2.46</b>
Seasons of 1892 and 1893.....	1.93	3.00	<b>2.46</b>

8. *Pounds of Albumen in One Hundred Pounds of Milk.*

	Least.	Greatest.	Average.
Season of 1892.....	0.55	0.86	<b>0.66</b>
Season of 1893.....	0.47	0.87	<b>0.68</b>
Seasons of 1892 and 1893.....	0.47	0.87	<b>0.68</b>

9. *Pounds of Casein for One Pound of Albumen in Normal Milk.*

	Least.	Greatest.	Average.
Season of 1892.....	2.60	4.60	<b>3.74</b>
Season of 1893.....	2.80	5.58	<b>3.62</b>
Seasons of 1892 and 1893.....	2.60	5.58	<b>3.66</b>

10. *Pounds of Fat for One Pound of Casein in Normal Milk.*

	Least.	Greatest.	Average.
Season of 1892.....	1.38	1.74	<b>1.50</b>
Season of 1893.....	1.38	1.78	<b>1.53</b>
Seasons of 1892 and 1893.....	1.38	1.78	<b>1.52</b>

11. *Pounds of Fat for One Pound of Casein and Albumen in Normal Milk.*

	Least.	Greatest.	Average.
Season of 1892.....	1.07	1.33	<b>1.18</b>
Season of 1893.....	1.06	1.33	<b>1.20</b>
Seasons of 1892 and 1893.....	1.06	1.33	<b>1.19</b>

TABLE SHOWING

Month.	Pou wat 100 l m
1892-1893.	
April.....	8
May.....	8
June.....	8
July.....	8
August.....	8
September.....	8
October.....	8
Average for two seasons..	<b>87</b>

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TABLE SHOWING AVERAGE COMPOSITION OF MILK DURING THE SEASONS OF 1892 AND 1893.

Month. 1892-1893.	Pounds of water in 100 lbs. of milk.	Pounds of solids in 100 lbs. of milk.	Pounds of solids not fat in 100 lbs. of milk.	Pounds of fat in 100 lbs. of milk.	Pounds of casein and albu- men in 100 lbs. of milk.	Pounds of casein in 100 lbs. of milk.	Pounds of albumen in 100 lbs. of milk.	Pounds of sugar, ash, etc., in 100 lbs. of milk.
April .....	88.02	11.98	8.55	3.43	2.81	2.29	0.52	5.74
May .....	87.57	12.43	8.85	3.58	3.02	2.34	0.68	5.83
June .....	87.36	12.64	9.00	3.64	3.24	2.47	0.77	5.76
July .....	87.48	12.52	8.90	3.62	3.07	2.43	0.64	5.83
August .....	87.35	12.65	8.81	3.84	3.02	2.39	0.61	5.79
September .....	87.26	12.86	8.88	3.98	3.20	2.55	0.65	5.68
October .....	86.50	13.50	9.27	3.23	3.55	2.81	0.74	5.73
<b>Average for two seasons.</b>	<b>87.33</b>	<b>12.67</b>	<b>8.92</b>	<b>3.65</b>	<b>3.14</b>	<b>2.46</b>	<b>0.68</b>	<b>5.78</b>

Most of the analyses of milk given in treatises on dairy chemistry, are from the milk of one single cow. The figures collected in the preceding tables have the advantage of being gathered from a great number of analyses of the milk of many cows mixed together, and of covering a lapse of time both considerable and continuous.

This study of the composition of factory milk had a twofold end in view: a search after its average composition and that of the variations, to which it is subject, during the season, on account of the preponderating influence of its composition on the yield of cheese, as well as on account of its importance as a means of establishing a legal standard for the purity of milk.

The cows of the patrons of cheeseries almost invariably calving in spring, these figures represent the variation due to the advancement of the period of lactation, modified more or less by special conditions of food; temperature, etc.

In examining the monthly averages, we observe a constant increase of the solids in April, May and June; then, a marked decrease in July and the first half of August, after which the solids begin to increase again and continue so the rest of the season. One naturally asks: why this exception in July and August to the general rule that the solids increase as the period of lactation advances? The experimenters studied it on account of its influence on the composition of milk and on the making of cheese. The only explanation they can give is the fact, that, towards mid-July, the pastures begin to suffer from drought, which has the general effect of diminishing rapidly the yield of milk, and of making its different elements vary abnormally. The fat increases, while the casein and albumen especially the latter, decrease.

*Pounds of Milk.*

Greatest.	Average.
7.03	6.48
6.69	6.45
7.03	6.46

Greatest.	Average.
4.35	3.69
4.60	3.77
4.60	3.75

*of Milk.*

Greatest.	Average.
3.76	3.13
3.60	3.14
3.76	3.14

*lk.*

Greatest.	Average.
3.00	2.47
2.85	2.46
3.00	2.46

*ilk.*

Greatest.	Average.
0.86	0.66
0.87	0.68
0.87	0.68

*il Milk.*

Greatest.	Average.
4.60	3.74
5.58	3.62
5.58	3.66

*! Milk.*

Greatest.	Average.
1.74	1.50
1.78	1.53
1.78	1.52

*Normal Milk.*

Greatest.	Average.
1.33	1.18
1.33	1.20
1.33	1.19

## 6. GENERAL SUMMARY OF RESULTS RELATING TO THE COMPOSITION OF WHEY.

### 1. Pounds of Solids in One Hundred Pound of Whey.

	Least.	Greatest.	Average.
Season of 1892.....	6.43	7.52	<b>6.91</b>
Season of 1893.....	6.72	7.25	<b>6.97</b>
Seasons of 1892 and 1893.....	6.43	7.52	<b>6.96</b>

### 2. Pounds of fat in One Hundred Pounds of Whey.

	Least.	Greatest.	Average
Season of 1892.....	0.23	0.50	<b>0.34</b>
Season of 1893.....	0.24	0.55	<b>0.38</b>
Seasons of 1892 and 1893.....	0.23	0.55	<b>0.36</b>

### 3. Pounds of Casein and Albumen in One Hundred Pounds of Whey.

	Least.	Greatest.	Average.
Season of 1892.....	0.67	1.07	<b>0.84</b>
Season of 1893.....	0.65	0.99	<b>0.84</b>
Seasons of 1892 and 1893.....	0.65	1.07	<b>0.84</b>

### 4. Tabulated Monthly Averages Showing Composition of Whey.

#### A. TABLE SHOWING AVERAGE COMPOSITION OF WHEY FOR THE SEASON OF 1892.

Month. 1892.	Pounds of water in 100 lbs of Whey.	Pounds of total solids in 100 lbs of whey.	Pounds of fat in 100 lbs. of whey.	Pounds of casein and al- bumen in 100 lbs. of whey.	Pounds of sugar, ash, etc., in 100 lbs. of whey.
<i>Factory-Experiments:</i>	93.17	6.83	0.40	0.73	5.70
May.....	92.98	7.02	0.38	0.81	5.83
June.....	92.99	7.01	0.31	0.88	5.82
July.....	93.05	6.95	0.35	0.83	5.77
August.....	93.08	6.92	0.38	0.80	5.74
September.....	93.18	6.82	0.41	0.85	5.56
October.....	93.04	6.96	0.38	0.98	5.60
<b>Average for Season....</b>	<b>93.04</b>	<b>6.96</b>	<b>0.36</b>	<b>0.84</b>	<b>5.76</b>

## 7. GENERAL SUMMARY OF RESULTS RELATING TO THE COMPOSITION OF GREEN CHEESE MADE FROM NORMAL MILK.

### 1. Pounds of Water in One Hundred Pounds of Green Cheese.

	Least.	Greatest.	Average
Season of 1892.....	33.50	38.80	<b>36.41</b>
Season of 1893.....	32.69	43.89	<b>37.05</b>
Seasons of 1892 and 1893.....	32.69	43.89	<b>36.84</b>

### 2. Pounds of Solids in One Hundred Pounds of Green Cheese.

	Least.	Greatest.	Average
Season of 1892.....	61.20	66.50	<b>63.59</b>
Season of 1893.....	56.11	67.31	<b>62.95</b>
Seasons of 1892 and 1893.....	56.11	67.31	<b>63.16</b>

## 3. F

Season of 1892.....  
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## 4. Po

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Season of 1892.....  
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## 7. Pounds

Season of 1892.....  
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## 8. Pou

Season of 1892.....  
Season of 1893.....  
Seasons of 1892 and 1

## F. TABLE SHOWING AVERAGE COMPOSITION OF WHEY FOR THE SEASON OF 1892.

Month

1892-1893.

April.....  
May.....  
June.....  
July.....  
August.....  
September.....  
October.....

**Average for two seasons**



COMPOSITION OF WHEY.

*Whey.*

Greatest.	Average.
7.52	6.91
7.25	6.97
7.52	6.96

*Whey.*

Greatest.	Average.
0.50	0.34
0.55	0.38
0.55	0.36

*Whey.*

Greatest.	Average.
1.07	0.84
0.99	0.84
1.07	0.84

*Whey.*

SEASON OF 1892.

lbs of and al- in 100 whey.	Pounds of sugar, ash, etc., in 100 lbs. of whey.
73	5.70
31	5.83
38	5.82
33	5.77
30	5.74
35	5.56
98	5.60
<b>34</b>	<b>5.76</b>

COMPOSITION OF GREEN

*Whey Cheese.*

Greatest.	Average.
38.80	36.41
43.89	37.05
43.89	36.84

*Whey Cheese.*

Greatest.	Average.
66.50	63.59
67.31	62.95
67.31	63.16

3. *Pounds of Fat in One Hundred Pounds of Green Cheese.*

	Least.	Greatest.	Average
Season of 1892.....	31.00	36.79	<b>34.30</b>
Season of 1893.....	30.00	35.98	<b>33.59</b>
Seasons of 1892 and 1893.....	30.00	36.79	<b>33.83</b>

4. *Pounds of Casein in One Hundred Pounds of Green Cheese.*

	Least.	Greatest.	Average
Season of 1892.....	23.18	26.10	<b>24.30</b>
Season of 1893.....	20.80	26.11	<b>23.43</b>
Seasons of 1892 and 1893.....	20.80	26.11	<b>23.72</b>

5. *Pounds of Fat for One Pound of Casein in Cheese.*

	Least.	Greatest.	Average.
Season of 1892.....	1.27	1.54	<b>1.41</b>
Season of 1893.....	1.27	1.60	<b>1.43</b>
Seasons of 1892 and 1893.....	1.27	1.60	<b>1.42</b>

6. *Pounds of Fat in One Hundred Pounds of Cheese-Solids.*

	Least.	Greatest.	Average.
Season of 1892.....	50.39	56.83	<b>53.94</b>
Season of 1893.....	51.01	56.15	<b>53.36</b>
Seasons of 1892 and 1893.....	50.39	56.83	<b>53.56</b>

7. *Pounds of Solids not Fat in One Hundred Pounds of Cheese-Solids.*

	Least.	Greatest.	Average.
Season of 1892.....	43.17	49.61	<b>46.06</b>
Season of 1893.....	43.85	48.99	<b>46.64</b>
Seasons of 1892 and 1893.....	45.17	49.61	<b>46.44</b>

8. *Pounds of Fat for one Pound of Solids not Fat in Cheese.*

	Least.	Greatest.	Average.
Season of 1892.....	1.01	1.32	<b>1.17</b>
Season of 1893.....	1.04	1.28	<b>1.14</b>
Seasons of 1892 and 1893.....	1.01	1.32	<b>1.15</b>

F. TABLE SHOWING MONTHLY AVERAGE COMPOSITION OF GREEN CHEESE MADE FROM NORMAL FACTORY MILK DURING THE SEASONS OF 1892 AND 1893.

Month 1892-1893.	Pounds of water in 100 lbs of cheese	Pounds of solids in 100 lbs of cheese	Pounds of solids not fat in 100 pounds of cheese.	Pounds of fat in 100 lbs. of cheese.	Pounds of casein in 100 lbs. of cheese.	Pounds of sugar, ash, etc., in 100 lbs. of cheese.	Pounds of fat for one pound of casein in cheese.
April.....	38.00	62.00	29.06	32.94	23.02	6.04	1.43
May.....	37.11	62.89	29.41	33.48	23.61	5.80	1.42
June.....	36.22	63.78	29.99	33.79	24.71	5.28	1.38
July.....	36.25	63.75	30.00	33.75	23.96	6.04	1.41
August.....	36.69	63.31	28.64	34.67	23.04	5.60	1.50
September.....	36.86	63.14	28.54	34.60	23.30	5.24	1.48
October.....	38.29	61.71	28.73	32.98	23.04	5.69	1.43
<b>Average for two seasons.</b>	<b>36.84</b>	<b>63.16</b>	<b>29.33</b>	<b>33.83</b>	<b>23.72</b>	<b>5.61</b>	<b>1.42</b>

#### 4 GENERAL SUMMARY OF RESULTS RELATING TO LOSS AND RECOVERY OF MILK-CONSTITUENTS IN CHEESE-MAKING.

##### 1 Amount of Milk-Solids lost and recovered in Cheese-Making.

###### a. Pounds of milk-solids lost in whey for 100 lbs. of milk.

	Least.	Greatest.	Average.
Season of 1892.....	5.81	6.83	<b>6.21</b>
Season of 1893.....	6.09	6.49	<b>62.7</b>
Seasons of 1892 and 1893.....	5.81	6.83	<b>62.5</b>

###### b. Pounds of milk-solids recovered in cheese for 100 lbs of milk.

	Least.	Greatest.	Average.
Season of 1892.....	5.31	7.58	<b>6.43</b>
Season of 1893.....	5.55	6.50	<b>6.35</b>
Seasons of 1893 and 1893.....	5.31	7.58	<b>6.38</b>

###### c. Per cent. of solids in milk lost in whey.

	Least.	Greatest.	Average.
Season of 1892.....	43.59	54.73	<b>49.13</b>
Season of 1893.....	45.34	53.40	<b>29.58</b>
Seasons of 1892 and 1893.....	43.59	54.73	<b>49.48</b>

###### d. Per cent of solids in milk recovered in cheese.

	Least.	Greatest.	Average
Season of 1892.....	45.27	56.43	<b>50.87</b>
Season of 1893.....	46.60	54.66	<b>50.32</b>
Seasons of 1892 and 1893.....	45.27	56.43	<b>50.52</b>

e. The proportion of milk-solids lost in the whey decreased from month to month as the season advanced, while the proportion of milk solids recovered in cheese increased. This was due to an increase of cheese-making solids (fat and casein) in the milk, since these increased from month to month with the advance of lactation, while the whey-solids (albumen, sugar, etc.,) remained quite uniform in amount, as compared with the fat and casein.

##### 2. Amount of Fat in Milk lost and recovered in Cheese Making.

###### a. Pounds of fat lost in 100 lbs of milk.

	Least.	Greatest.	Average.
Season of 1892.....	0.21	0.45	<b>0.31</b>
Season of 1892.....	0.22	0.50	<b>0.34</b>
Seasons of 1892 and 1893.....	0.21	0.50	<b>0.33</b>

###### b. Pounds of fat recovered in cheese for 100 lbs. of milk.

	Least.	Greatest.	Average.
Season of 1892.....	2.77	4.03	<b>3.38</b>
Season of 1893.....	2.94	4.05	<b>3.39</b>
Seasons of 1892 and 1893.....	2.77	4.05	<b>3.39</b>

###### c. Per cent. of fat in milk lost in whey.

	Least.	Greatest.	Average.
Season of 1892.....	5.68	12.86	<b>8.40</b>
Season of 1893.....	5.80	13.51	<b>9.12</b>
Seasons of 1892 and 1893.....	5.68	13.51	<b>8.87</b>

###### d. Per c

Season of 1892.....  
Season of 1893.....  
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###### 3. Amount

###### a. Pounds

Season of 1892.....  
Season of 1893.....  
Seasons of 1892 and 1

b. Pounds  
milk.

Season of 1892.....  
Season of 1893.....  
Seasons of 1892 and 18

###### c. Per cen

Season of 1892.....  
Season of 1893.....  
Seasons of 1892 and 18

###### d. Per cen

Season of 1892.....  
Season of 1893.....  
Seasons of 1892 and 18

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## RECOVERY OF MILK-

## e-Making.

## milk.

Greatest.	Average.
6.83	6.21
6.49	6.27
6.83	6.25

## of milk.

Greatest.	Average.
7.58	6.43
6.50	6.35
7.58	6.38

Greatest.	Average.
54.73	49.13
53.40	29.58
54.73	49.48

Greatest.	Average.
56.43	50.87
54.66	50.32
56.43	50.52

sed from month to  
recovered in cheese  
(fat and casein) in  
vance of lactation,  
orm in amount, as

## e Making.

Greatest.	Average.
0.45	0.31
0.50	0.34
0.50	0.33

## milk.

Greatest.	Average.
4.03	3.38
4.05	3.39
4.05	3.39

Greatest.	Average.
12.86	8.40
13.51	9.12
13.51	8.87

## d. Per cent. of fat in milk recovered in cheese.

	Least.	Greatest.	Average.
Season of 1892.....	87.14	94.32	94.60
Season of 1893.....	86.49	94.20	90.88
Seasons of 1892 and 1893.....	86.49	94.32	91.13

e. The smallest proportion of fat lost was in June, with October second, when the milk was richest in fat; while the largest proportion of fat lost was in April or May when the amount of fat in the milk was least. The results of our two years' work all go to show that the proportion of fat lost in cheese-making is quite independent of the amount of fat in milk. The variations that occur in loss of fat are due either to the conditions of the milk or to some special conditions employed in manufacture.

## 3. Amount of Casein and Albumen in Milk lost and Recovered in Cheese-Making.

## a. Pounds of casein and albumen lost in whey for 100 lbs. of milk.

	Least.	Greatest.	Average.
Season of 1892.....	0.61	0.94	0.75
Season of 1893.....	0.58	0.88	0.76
Seasons of 1892 and 1893.....	0.58	0.94	0.76

## b. Pounds of casein and albumen recovered in cheese for 100 lbs. of milk.

	Least.	Greatest.	Average.
Season of 1892.....	1.90	2.82	2.38
Season of 1893.....	2.07	2.76	2.37
Seasons of 1892 and 1893.....	1.90	2.82	2.37

## c. Per cent. of casein and albumen in whey.

	Least.	Greatest.	Average.
Season of 1892.....	22.07	25.00	23.96
Season of 1893.....	20.00	26.30	24.28
Seasons of 1892 and 1893.....	20.00	26.30	24.28

## d. Per cent. of casein and albumen in milk recovered in cheese.

	Least.	Greatest.	Average.
Season of 1892.....	75.00	77.93	76.04
Season of 1893.....	73.70	80.00	75.72
Seasons of 1892 and 1893.....	73.70	80.00	75.72

e. The proportion of casein and albumen lost in cheese-making has been found to be very uniform and quite independent of variation in conditions of manufacture. The amount of albumen in milk largely determines the amount of casein and albumen lost in whey, since there is very little casein lost. On the other hand, the amount of casein recovered in cheese closely follows the amount of casein in the milk and is governed by this more than by conditions of manufacture.



AVERAGE LOSS AND RECOVERY OF THE ELEMENTS OF MILK IN CHEESE-MAKING.

Per 100 lbs. of milk, seasons 1892, 1893.

	Lbs.	Lbs. Lost.	Lbs. Recovered.	Per. Cent. Lost.	Per Cent. Recovered.
Solids.....	12.63	6.25	6.38	49.48	50.82
Fat.....	3.72	0.33	3.39	8.87	91.13
Casein and albumen.....	3.13	0.76	2.37	24.28	75.72

GENERAL SUMMARY OF THE RESULTS RELATING TO INFLUENCE OF COMPOSITION OF MILK ON YIELD OF GREEN CHEESE.

1. Yield of Green Cheese From One Hundred Pounds of Milk.

	Least.	Greatest.	Average.
Season of 1892.....	8.47	12.28	10.06
Season of 1893.....	8.94	13.17	10.09
Seasons of 1892 and 1893.....	8.47	13.17	10.08

2. Pounds of Milk Required to Make One Pound of Green Cheese.

	Least.	Greatest.	Average.
Season of 1892.....	8.14	11.81	9.94
Season of 1893.....	7.60	11.19	9.91
Seasons of 1892 and 1893.....	7.60	11.81	9.92

3. Pounds of Water Retained in Green Cheese Made from One Hundred Pounds of Milk.

	Least.	Greatest.	Average.
Season of 1892.....	3.16	4.76	3.66
Season of 1893.....	3.11	5.78	3.75
Seasons of 1892 and 1893.....	3.11	5.78	3.72

4. Pounds of Fat Retained in Green Cheese Made from One Hundred Pounds of Milk.

	Least.	Greatest.	Average.
Season of 1892.....	2.77	4.03	3.38
Season of 1893.....	2.94	4.05	3.39
Seasons of 1892 and 1893.....	2.77	4.05	3.39

5. Pounds of Casein Retained in Cheese Made from One Hundred Pounds of Milk.

	Least.	Greatest.	Average.
Season of 1892.....	1.90	2.82	2.38
Season of 1893.....	2.07	2.76	2.37
Seasons of 1892 and 1893.....	1.90	2.82	2.37

6. Pounds of Green Cheese Made for One Pound of Fat in Milk.

	Least.	Greatest.	Average.
Season of 1892.....	2.53	2.96	2.73
Season of 1893.....	2.53	3.06	2.71
Seasons of 1892 and 1893.....	2.52	3.06	2.72

The quantity of cheese made per 100 lbs. of milk increases from month to month as the season advances, because the elements that produce cheese, i. e. the fat and the casein, increase in the milk; and, inversely, the quantity of milk required to make a pound of cheese decreases from month to month, for the same reason.

The quantity of water, contained in the cheese from 100 lbs. of milk, increases similarly because of the increase of fat and casein, which makes the cheese capable of retaining a greater proportion of water.

The quantity season in proportion

The fat of the and the yield of ch the dairy, because method, which con To the Geneva stat relation, and by th lishment of the ru the quantity of che the yield of milk in

The first and c it can make; the y

The second is be understood all tl all impurities, &c.

The third is th upon the skill of th moisture.

With the milk sufficiently to enabl cheese would no lon

CONCLUSION his long and learnec the Association to t

I. Of the eler FAT and CASEIN.

II. In factory

III. The loss milk.

RECAPITULATORY

Group.

I.....
II.....
III.....
IV.....
V.....

## N CHEESE-MAKING.

Cent.	Per Cent. Recovered.
	50.82
	91.13
	75.72

## E OF COMPOSITION

## s of Milk.

Greatest.	Average.
12.28	10.06
13.17	10.09
13.17	10.08

## Green Cheese.

Greatest.	Average.
11.81	9.94
11.19	9.91
11.81	9.92

## dred Pounds of Milk.

Greatest.	Average.
4.76	3.66
5.78	3.75
5.78	3.72

## red Pounds of Milk.

Greatest.	Average.
4.03	3.38
4.05	3.39
4.05	3.39

## ed Pounds of Milk.

Greatest.	Average.
2.82	2.38
2.76	2.37
2.82	2.37

## Fat in Milk.

Greatest.	Average.
2.96	2.73
3.06	2.71
3.06	2.72

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i. e. the fat and the  
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The quantity of fat in the cheese increases from month to month during the season in proportion as the fat increases in the milk, and so with the casein.

*The fat of the milk and the yield of cheese.*—The relation between the fat of milk and the yield of cheese has become one of the most important of questions concerning the dairy, because on the *uniformity of this relation* depends the correctness of the method, which consist in taking the fat as the basis of the dividends in the factories. To the Geneva station is due the honor of being the first to draw attention to this relation, and by the results of its researches to have greatly contributed to the establishment of the rule, that, in normal factory milk, the fat is a most exact measure of the quantity of cheese that can and ought to be made with the milk. In *calculating the yield of milk in cheese*, there are three factors to be considered :

The first and chief is *the composition of milk* : that determines how much cheese it can make ; *the yield must be proportionate to the fat and casein*.

The second is *the condition of the milk* : it affects the yield ; by condition must be understood all things connected with the freshness of the milk, its freedom from all impurities, &c.

The third is *the process of manufacture* : it affects the yield ; it depends greatly upon the skill of the maker to control the loss of fat and casein and the retention of moisture.

With the milk always in good order, and the science of manufacture perfected sufficiently to enable the maker to control all the details of his work, the yield in cheese would no longer depend upon anything but the composition of the milk.

CONCLUSIONS.—Among other conclusions, drawn by Prof. Van Slyke, from his long and learned investigations, we would draw the attention of the members of the Association to the following :

I. Of the elements of milk, two, and two only, affect the production of cheese : FAT and CASEIN.

II. In factory-milk,  $\frac{2}{3}$  of a pound of casein corresponds with 1 pound of fat.

III. *The loss of fat in cheese-making is utterly independent of the richness of the milk.*

RECAPITULATORY TABLE OF THE AMOUNT OF FAT LOST IN MAKING CHEESE

Group.	Lbs. of fat per 100 lbs. of milk.	Lbs. of fat lost in the whey per 100 lbs of milk.	Per centage of fat lost in the whey.
I.....	3 to 3.5	0.32	9.55
II.....	3.5 to 4	0.33	8.33
III.....	4 to 4.5	0.32	7.70
IV.....	4.5 to 5	0.28	5.90
V.....	5 to 5.25	0.31	6.00

Therefore, the loss of fat is not greater, but on the contrary is less, in making cheese with rich milk than with poor.<sup>1</sup>

IV. The losses of fat in cheese making are increased by cutting the curd too small and stirring too briskly; the losses of casein, by careless and rough cutting and stirring, by the agitating of the curd when the whey is running off, and by bad strainers: this concerns the makers.

And, now, for the patrons' turn: great loss of fat is caused by the bad condition of the milk; this is under the control of the patrons; a single can of bad milk is sufficient to cause great losses: it would not be difficult to prove that it would pay to throw away 200 or 300 pounds of bad milk, paying their owner for them, rather than mix them with some thousands of pounds of good milk, and then get a poorer yield of inferior cheese. It may be safely said that a single can of really bad milk will cause a loss of 10 to 25 cents per 100 lbs. of good milk with which it is mixed.

V. The commercial quality and trade value of cheese depends greatly on the ratio of fat to casein in it, as the following table shows:

Quality.	Price current at New York Feb. 1894.	Difference in value.	Lbs. of fat per lb. of casein	Lbs. of casein per 100 lbs. of fat.
State cheese, full cream, choice.....	11½ to 11¾		1.42	0.70
Do., partly skimmed, choice...	9 to 9½	2 to 2½	1.00	1.00
Do., fully do. do. ...	2 to 3	{ 8½ to 5½ } { 6½ to 7 }	0.10	10.00

The figures in this table depend upon the results of considerable analytical work

<sup>1</sup> The following table, from the same bulletins, the two last columns of which we have added, leads to the same conclusions:

No. of experiments.	% of fat in milk.	Lbs. of fat in the cheese.	Lbs. of fat lost.	% of fat lost
3. 1. 5 <sup>a</sup> .....	3.05	2.83	<b>0.22</b>	<b>7.21</b>
4. 2. 6.....	3.35	3.13	<b>0.22</b>	<b>6.56</b>
7*.....	3.56	3.24	<b>0.32</b>	<b>9.01</b>
9. 11. 12.....	4.20	4.00	<b>0.20</b>	<b>4.76</b>
10. 13. 14.....	4.30	4.10	<b>0.20</b>	<b>4.65</b>
8*.....	6.00	5.58	<b>0.42</b>	<b>7.00</b>

\* The milk used in experiments 7 and 8 was normal; again, it must be observed that the proportionate loss was less in this richer milk and greater in the poorer. We saw that the average ratio of fat to casein in the normal milk was 1.52 to 1; now, in the milk of experiment 7, it was only 1.03 to 1, and in the experiment 8 it was 1.73 to 1; hence, we conclude that there had been skimming in the former case, and an addition of cream in the second; the consequence seems to be that the practice of partially skimming milk in the fall, under the pretext that the milk is then too rich, induces a greater proportional loss in the whey.—E. C.

on cheese "full-  
judge of the qual  
at are the same  
the ratio that fat

VI. The pl  
cheese factory as



is less, in making

getting the curd too  
and rough cutting  
ing off, and by bad

the bad condition  
can of bad milk is  
that it would pay to  
for them, rather  
than get a poorer  
of really bad milk  
which it is mixed.  
ends greatly on the

on cheese "full-cream" and "full-skimmed." The buyers and the chemist do not judge of the quality of cheese from the same point of view, but the results they arrive at are the same, namely: that the quality and value of cheese depends greatly upon the ratio that fat bears to casein in the cheese judged.

VI. The plan of paying for milk according to its richness is as applicable to the cheese factory as to the creamery.

per ein	Lbs. of casein per 100 lbs. of fat.
	0.70
	1.00
	10.00

le analytical work

s of which we have

ost.	% of fat lost
	7.21
	6.56
	9.01
	4.76
	4.65
	7.00

be observed that the  
r. We saw that the  
milk of experiment  
conclude that there  
second; the conse-  
ll, under the pretext  
ey.—E. C.

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## OUR DAIRY SCHOOL.

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### IMPORTANT NOTICE TO THE PUBLIC.

The Committee of the Dairy School thinks it advisable to draw the attention of those interested to the programme of the winter of 1893-94, which will be found hereinafter; although the programme for the winter of 1894-95 is not yet drawn up, it will probably run on the same lines and comprise several series of courses of instruction, the dates of which will be announced early in the year, probably in October.

The number of students in each series will be *rigidly limited*; the requests for admission must be made at least 15 days in advance, and in writing, to the secretary of the School at St. Hyacinthe, who will acknowledge their receipt and mention the date of the opening of the course to which the candidate will be admitted. *No one will be admitted to the school without having stated his desire beforehand*; some students, this year, came to solicit their admission to the course on the very day of its opening, and thence arose an embarrassment that must be avoided at any cost. The secretary of the School then will refuse ruthlessly in future all those who thus present themselves on the eve of the opening.

Students must not wait till the close of the winter to attend the School; the courses in December and January are the same as those of the other months; up to the present time they have been less numerously attended, and those who have attended them, being fewer, had a better chance of working, either at making butter or cheese, or in testing milk.

There will probably be, in December and March, two special courses for makers speaking English.

We cannot too strongly insist that those who propose to attend the courses at the School next winter, 1894-95, send in their application in good time.

For any information address the Secretary of the Dairy School, St. Hyacinthe, Quebec.

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### DAIRY SCHOOL AND EXPERIMENT STATION, ST. HYACINTHE.

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#### PROGRAMME 1893-94.

In this programme there are three principal divisions:

1. Instruction in the best methods:
  - Of producing milk in winter as well as in summer;
  - Of making butter and cheese;
  - Of testing milk.

2. The train  
already establishe  
3. The exper  
dairy, and of new  
in dairying.

With thi· pro  
the general publi  
already makers; t  
cheese.

The opening o  
November, 1893.

During the co  
St. Hyacinthe, th  
Association, maker  
the School factory

The instruction  
the Province of Que

There will be  
who already possess

1. From th
2. "
3. "
4. "
5. "
6. "
7. "
8. "

In each of the ab  
work in making butte  
of an hour daily on t  
milk cow [1]; Feed  
manufacture [1]; Ch  
Elementary chemistry  
an hour on the subject

2. The training of inspectors of creameries and cheeseries for the syndicates already established or to be established.

3. The experimental study of novel systems of machinery and apparatus for the dairy, and of new processes of making, as well as of all progressive steps to be taken in dairying.

With this programme, the Dairymen's Association thinks it to be important to the general public to profit by the teaching of the schools: first, those who are already makers; and next, youths who desire to learn the art of making butter and cheese.

#### OPENING OF THE COURSES.

The opening of the REGULAR COURSES of instruction has been fixed for the 21st November, 1893.

During the convention of the Dairymen's Association, which will take place at St. Hyacinthe, the 5th, 6th and 7th of December next, the members of the Association, makers of butter and cheese, and the general public will be admitted to the School factory as visitors only.

#### INSTRUCTION

The instruction will be free to all the members of the Dairymen's Association of the Province of Quebec.

#### DURATION AND CHARACTER OF THE COURSES.

##### *Courses for March.*

There will be eight series of regular courses, restricted to makers or youths who already possess some experience in making. These will be held:

1. From the 20 November, inclusive to the 5th December, 1893.
2. " 11 December " " 23rd " "
3. " 8th January, 1894 " " 20th January 1894
4. " 22nd " " " " 3rd February "
5. " 5th February " " 21st " "
6. " 26th " " " 10th March "
7. " 12th March " " 24th " "
8. " 26th " " " 12th April "

In each of the above regular courses the instruction will comprise: 1. Practical work in making butter and cheese; 2. Practical testing of milk; 3. Twelve lessons of an hour daily on the following subjects: Farming for dairy purposes [1]; The milch cow [1]; Feeding the milch cow [1]; Utilization of the residue of the manufacture [1]; Cheese-making [2]; Butter-making [2]; Testing milk [2]; Elementary chemistry of milk [2]. Each lesson will be followed by a discussion of an hour on the subject of the lesson and the practical work of the day; 4. And a



lecture, either from Prof. Robertson, Commissioner of Dairying, or from Mr. J. C. Chapais, Asst. Commissioner.

*The number of students* in each series is limited to 30.

*The fifth series* is specially reserved for makers of at least three years' experience as managers of factories, candidates for the *diploma of inspector of syndicates of creameries or cheeseries*. Special examinations will be held on the 22nd and 23rd of February, to which none will be admitted but those who have attended a full course of this 5th series.

If all the *inspector-candidates* cannot be admitted to the 5th series, those who were excluded will be expected to attend the courses of the 8th series, the examinations on which will be held on the 13th and 14th of April.

Makers who may wish to *attend two consecutive series of courses*, must inscribe their names for the 4th and 7th series, so as to profit by the special instruction given in the 5th and 8th series, respectively.

For admission to the eight first series, the students must engage to attend the whole course of each series, and to present themselves at the School secretary's office the eve of the opening of the courses, or on the day itself, before 8 a.m.

The certificate of attention and application will be granted to those students alone who shall have attended the entire course to the satisfaction of the professors.

#### *Courses for Apprentices.*

From April 15th there will be instituted one or more series of *preparatory courses* for youths who intend to enter creameries or cheeseries as apprentices during the next season. These youths may, after having passed a summer at a factory return to the School the following winter to finish their courses.

Those factories who may wish to have an assistant or apprentice who has attended the preparatory course, may communicate with the School secretary, who will register their requests, as well as the applications of the apprentice students.

#### *Free Courses.*

Those *makers* who shall not have been able to attend a regular course, shall, upon previous request, be admitted to free courses of very short duration, which shall take place from the 15th April up to the opening of the season of making.

#### GENERAL CONDITIONS OF ENTRANCE.

For admission to the School, the candidate must :

1. Pay the yearly subscription of one dollar as member of the Dairymen's Association <sup>(1)</sup>

(1) This payment entitles the member to share in all the advantages of the Association and especially to a copy of all its publications, and notably to its annual report, the importance and interest of which are yearly on the increase.

2. To be at  
3. To be able  
The application  
furnished on request

All applications  
which the student  
Applications to

Every student  
the course he is to  
assigned, he should  
candidate may take

The students  
but they will have  
about three dollars  
situated opposite to  
good private board  
The Board of  
ity of looking after  
School.

St. Hyacinthe,  
The P.

The D.

The Secretary, E.

The School and E.  
of the Association, at  
addressed to the Secretary

2. To be at least 15 years old.
3. To be able to read and cipher.

The application for admission to the School is to be made on a form that will be furnished on request.

#### DELAY OF THE APPLICATION.

All applications for admission should be made at least 15 days before the date on which the student desires to be admitted.

*Applications to be addressed to the Secretary of the Dairy School, St. Hyacinthe.*

#### CONVOCATION OF THE STUDENTS.

Every student, on admission, receives formal notice of the date and duration of the course he is to attend. If he is prevented from attending the School at the date assigned, he should immediately give notice to the Secretary, in order that another candidate may take his place as a student.

#### BOARD AND LODGING.

The students will have rooms for work and study allotted to them in the School, but they will have to find board and lodging *for themselves*. They will easily get, for about three dollars a week, in the immediate neighborhood of the School, which is situated opposite the St. Hyacinthe Seminary, ten minutes' walk from that town, good private board in families recommended by the corporation of the Seminary.

The Board of Directors of the School cannot in any way assume the responsibility of looking after the young students after the hours of work or study in the School.

St. Hyacinthe, November 8th, 1893.

*The President of the Dairyman's Association  
of the Province of Quebec,*

*TH. MONTMINY, Prest.*

*The Director of the School and  
Experiment Station,*

*JAS. W. ROBERTSON.*

*The Secretary, E. CASTEL.*

#### TO THE PUBLIC.

The School and Experiment Station of St. Hyacinthe becomes the headquarters of the Association, and all communications concerning the Association are to be addressed to the Secretary of the Dairymen's Association, St. Hyacinthe.

ANNEXES TO REPORT OF THE COMMITTEE OF THE DAIRY SCHOOL.

(See Page 161.)

MEMORANDUM.

WORK DONE AND SUPPLIES FURNISHED FOR THE DAIRY SCHOOL AND EXPERIMENT STATION OF ST. HYACINTHE.

Numbers of the Accts.	CONTRACTORS AND SUPPLIERS OF GOODS.	Letters.	Amount Claimed.	Numbers of Cheques.	Sum Paid.	Remain- ing due.
I. BUILDING.						
1	<b>Jos. Chenette :</b>					
	1st Account.....	A	\$1,887 42			
	2nd ".....	B	267 86			
	Gosselin's Account.....	C	205 00	4	\$2,187 80	\$172 48
	<b>Louis Gosselin :</b>					
	Account.....	C	400 56	36	195 56	
	Paid him by Chenette.....		205 00			
3	<b>Paquette and Godbout :</b>					
	1st Account.....	D	644 98			
	2nd ".....	E	102 05	31	400 09	353 36
	3rd ".....	F	6 33			
	<b>F. Dudley :</b>					
	Account.....	G	451 16	19	398 36	
	Paid on acct. Chenette (Acct. No. 1)		52 80			
5	<b>Raymond et Freres :</b>					
	Account.....	H	338 43			338 43
6	<b>A. Blondin :</b>					
	1st Account.....	I	518 50	41	200 00	459 21
	2nd ".....	J	140 71			
7	<b>Jos. Leduc :</b>					
	1st Account.....	K	268 18	17	268 18	20 21
	2nd ".....	L	20 21			
8	<b>A. Roberge :</b>					
	1st Account.....	M	77 30	45	77 30	32 00
	2nd ".....	N	32 09			
9	<b>E. T. Coderre :</b>					
	Account.....	O	19 03	46	19 03	
10	<b>M. Benoit :</b>					
	Account.....	P	2 25			2 25
11	<b>G. Lessard :</b>					
	Account.....	Q	1 55			1 55
	<b>Total.....</b>		<b>\$5,125 81</b>		<b>\$3,746 23</b>	<b>\$1,379 58</b>

WORK DONE AND

Numbers of the Accts. CONTRACTORS

	<b>II. MACHIN</b>
12	<b>J. de L. Tache</b> 1st Account... 2nd ".....
13	<b>F. Wilson :</b> 1st Account... 2nd ".....
14	<b>J. L. Goodhue</b> Account.....
15	<b>D. M. Macpher</b> Account.....
16	<b>F. X. Bertrand</b> 1st Account... 2nd ".....
17	<b>I. Arpin :</b> 1st Account... 2nd ".....
18	<b>Moseley &amp; Stodd</b> Account.....
19	<b>O. Chalifoux et l</b> Account.....
20	<b>Gurney &amp; Co. :</b> Account.....
21	<b>Sam. Bourgeois..</b>
	Tota
	<b>III. GENER</b>
22	<b>Travelling Expens</b> Account (vouchers
	To ca



DAIRY SCHOOL.

 WORK DONE AND GOODS DELIVERED FOR THE DAIRY SCHOOL AND EXPERIMENT  
 STATION OF ST. HYACINTHE.—Continued.

AND EXPERIMENT

Numbers of the Accts.	CONTRACTORS AND SUPPLIERS OF GOODS.	Letters.	Amount Claimed	Numbers of Cheques.	Sum Paid.	Remain- ing due.
II. MACHINERY, TOOLS, Etc., Etc.,						
12	<b>J. de L. Tache :</b>					
	1st Account.....	R	\$777 00	12		
	2nd " .....	S	65 85	32	\$842 85	
13	<b>F. Wilson :</b>					
	1st Account .....	T	690 00	23	690 00	\$ 75 46
	2nd " .....	U	74 46			
14	<b>J. L. Goodhue :</b>					
	Account.....	V	22 00	27	22 00	
15	<b>D. M. Macpherson :</b>					
	Account.....	X	95 75	26	65 75	
16	<b>F. X. Bertrand :</b>					
	1st Account.....	Y	536 04			
	2nd " .....	Z	18 08	39	280 00	274 12
17	<b>I. Arpin :</b>					
	1st Account.....	A'	95 50			
	2nd " .....	B'	34 50			130 00
18	<b>Moseley &amp; Stoddard :</b>					
	Account.....	C'	147 25			147 25
19	<b>O. Chalifoux et Fils :</b>					
	Account.....	D'	11 90	42	11 99	
20	<b>Gurney &amp; Co. :</b>					
	Account.....	E'	15 25	44	15 25	
21	<b>Sam. Bourgeois.....</b>	F'	19 19			19 19
	<b>Total.....</b>		<b>\$2,573 87</b>		<b>\$1,927 84</b>	<b>\$646 02</b>
III. GENERAL EXPENSES.						
22	<b>Travelling Expenses :</b>					
	Account (vouchers, 1 to 11).....	G'	84 54			
	To carried forward..		89 54			

Sum Paid.      Remain-  
                    ing  
                    due.

\$2,187 80      \$172 48

195 56

400 09      353 36

398 36

338 43

200 00      459 21

268 18      20 21

77 30      32 00

19 03

1

\$3,746 23      \$1,379

WORK DONE AND GOODS DELIVERED FOR THE DAIRY SCHOOL AND EXPERIMENTAL STATION OF ST. HYACINTHE.—Continued.

Numbers of Accounts.	CONTRACTORS AND SUPPLIERS OF GOODS.	Letters.	Amount Claimed.	Numbers of Cheques.	Sums Paid.	Remain- ing Due.
	Brought forward....		\$89 54			
	Paid cheque No. 1.....		54 24	1	\$54 24	
	Balance paid cheque No. 14, Acct. 24.		35 30	14		
23	<b>Travelling expenses :</b>					
	Acct.....		20 45	{ 4 <sup>1</sup> / <sub>2</sub> 5	} 20 45	
24	1st Acct.....	H'	19 82	{ 6. 10		
	2nd ".....	I'	22 90			
	Paid Acct. No. 22.....	J'	35 30	14	78 02	
25	<b>Freight :</b>					
	1st Acct.....	K'	13 20			
	2nd ".....	L'	13 79			
	3rd ".....	M'	17 40			
			44 39			
	2nd Acct. to be paid by the Ass.....		13 79			
26			30 60	16	44 39	
	<b>Travelling expenses and freight :</b>					
27	Acct.....	N'	14 81			
28	".....	O'	1 15	20	15 96	
	".....	P'	6 35	33	6 35	
	".....	Q'	6 00			6 00
29	<b>Insurance :</b>					
	Policy.....	R'	90 00	29	90 00	
30	<b>Notarial costs :</b>					
	Acct.....	S'	75 00	34	75 00	
31	<b>Customs :</b>					
	Acct.....	T'	44 10	22	44 10	
	<b>Freight and various :</b>					
32	Acct.....	U'	26 93	28	26 93	
33	".....	V'	15 04			
	".....	X'	8 24			
	".....	Y'	4 31			
			27 59			
			27 59	{ 24. 38	} 27 59	
				{ 34		
34	<b>Travelling expenses of Messrs. Brodeur &amp; Fisher.....</b>					Account.
	<b>Total.....</b>		<b>475 24</b>		<b>483 03</b>	<b>\$6 00</b>

WORK DONE AND

Numbers of Accounts.	CONTRACTORS
	REC
	I. Building
	II. Machinery
	III. General F
	To be returned

Jos. C. DESAUTELS  
In account

1892.		
Sept. 3	To the Prov	
Oct. 26	To the Semi	
26	On account	
28	"	
Nov. 12	"	
19	"	
30	"	
Dec. 10	"	
17	"	
Sept. 5	By J. de L. T	
10	Jos. Cher	
17	"	
24	"	
24	I. J. A. M	
24	Alexis Cl	
24	J. de L. T	
30	Jos. Cher	
Oct. 7	"	
14	"	
17	"	
21	"	
26	J. de L. T	
28	Jos. Chen	
31	J. de L. T	

EXPERIMENTAL

WORK DONE AND GOODS DELIVERED FOR THE DAIRY SCHOOL AND EXPERIMENTAL STATION OF ST. HYACINTHE.—Continued.

Numbers of Accounts.	CONTRACTORS AND SUPPLIERS OF GOODS.	Letters.	Amount claimed.	Numbers of Cheques.	Sums Paid.	Remain- ing Due.
<b>RECAPITULATION.</b>						
	I. Building .....		\$5,125 81		3,746 23	\$1,379 58
	II. Machinery, etc.....		2,573 86		1,927 84	646 02
	III. General Expenses.....		475 24		483 03	6 00
	Total.....				6,157 10	2,031 60
	To be returned by the Dairymen's Assoc.....		8,174 91		13 79	.....
	Balance.....		8,174 91		6,143 31	2,031 60
					8,174 91	

Sums Paid.	Remain- ing Due.
\$54 24	
20 45	
78 02	
44 39	
15 96	
6 35	6 00
90 00	
75 00	
44 10	
26 93	
27 59	
Account.	
483 03	\$6 00

ACCOUNT B.

Jos. C. DESAUTELS, Notary.

*In account with the Dairymen's Association of the Province of Quebec.*

		Dr.			
1892.		To the Provincial Government.....		\$1,320 66	
Sept. 3		To the Seminary of St. Hyacinthe.			
Oct. 26		On account of loan .....	\$ 300 00		
26		“ “ .....	1000 00		
28		“ “ .....	1000 00		
Nov. 12		“ “ .....	1000 00		
19		“ “ .....	700 00		
30		“ “ .....	500 00		
Dec. 10		“ “ .....	500 00	5,000 00	6,320 66
17					
		CR.			
Sept. 5		By J. de L. Taché (see acct.).....		54 44	
10		Jos. Chenette, “ .....		50 00	
17		“ “ .....		125 00	
24		“ “ .....		75 00	
24		I. J. A. Marsan .....		5 00	
24		Alexis Chicoine .....		3 00	
24		J. de L. Taché .....		7 75	
30		Jos. Chenette .....		100 00	
Oct. 7		“ “ .....		100 00	
14		“ “ .....		150 00	
17		“ “ .....		4 70	
21		“ “ .....		150 00	
26		J. de L. Taché .....		777 00	
28		Jos. Chenette .....		200 00	
31		J. de L. Taché .....		78 02	
		To carried forward.....		1,879 91	6,320 66



ACCOUNT B.—(Continued.)

Jos. C. DESAUTELS, Notary,

In Account with the Dairymen's Association of the Province of Quebec.

1892.		Dr.		
		Brought forward (1) .....	\$1,879 71	\$6,320 66
Nov.	4	Jos. Chenette .....	200 00	
	7	J. de L. Taché .....	44 39	
	7	Jos. Leduc .....	268 18	
	10	Jos. Chenette .....	200 00	
	14	F. Dudley .....	451 16	
	17	J. de L. Taché .....	15 96	
	18	Jos. Chenette .....	200 00	
	21	J. A. Hamel, Customs .....	44 10	
	22	Frank Wilson .....	690 00	
	24	G. T. R., freight .....	15 04	
	25	Jos. Chenette .....	150 00	
	30	D. M. Macpherson .....	65 75	
	30	J. L. Goodhue & Co. ....	22 00	
	30	J. de L. Taché, express .....	26 93	
Dec.	2	J. O. Dion, insurance .....	90 00	
	2	Jos. Chenette .....	150 00	
	3	Paquet & Godbout .....	400 00	
	3	J. de L. Taché .....	65 85	
	3	E. Castel, for I. J. A. Marsan .....	6 35	
	7	Taché & Desautels .....	75 00	
	7	G. T. R., freight .....	4 31	
	9	Jos. Chenette .....	100 00	
	15	Louis Gosselin .....	195 56	
	16	Jos. Chenette .....	75 00	
	16	G. T. R., freight .....	8 24	
	17	F. X. Bertrand .....	280 00	
	23	Jos. Chenette .....	60 00	
	27	A. Blondin .....	200 00	
	27	O. Chalifoux & Fils .....	11 99	
	27	Jos. Chenette .....	50 00	
	27	E. & C. Gurney & Co. ....	15 25	
1893.				
Jan.	16	Alphonse Roberge .....	77 30	
	20	E. F. Codère .....	16 75	
	27	G. T. R., freight .....	2 28	
Feb.	3	E. Castel, to account current .....	50 00	
	14	Alphonse Roberge .....	33 34	
March	3	Noreau & Sicotte .....	21 45	
	6	D. M. Macpherson .....	3 00	
Oct.	24	Taché & Desautels .....	24 00	\$6,288 89
Nov.	23	Balance due .....		\$ 31 77
	23	By paid E. Castel .....		31 77

(1) This sum brought forward is really only \$1,879.21; the sum to be brought forward having been over reckoned by 20 cents, since the first item at the head of this account Dr. ought to read \$54.24, instead of \$54.44.

WORK DONE AT,

CONTRACTS

Edmond Salois, inde  
Peter McFarlane, fit  
E. F. Codère, paintin  
Magl. Benoit, path .  
Paquet & Godbout, g  
J. H. Morin, work ar  
Jos. Leduc, roofing g  
B. Benoit, earthwork  
J. D. Leclair, cartage  
Simmers & Evans, to  
Raymond & Frères, v  
A. Blondin, heating; v

II.—7

T. Robertson, furnitu  
Churns, to Customs .  
J. H. Morin, tinware  
F. N. Bédard, tartar.  
L. Arpin, tinware . . .  
A. Roberge, Joiner's v  
Churns .....

III.—(

Travelling expenses :

Casavant, photograph  
E. Castel, journey to l  
Carriage of library ...  
Inauguration of the s  
" "  
Travelling expenses, 7  
Freights, various. . . .  
Freight and express. .  
Carriages for Chouillo  
Freight for the Danis!

## ACCOUNT C.

WORK DONE AT, AND GOODS DELIVERED TO, THE DAIRY SCHOOL AND EXPERIMENT  
STATION OF ST. HYACINTHE.

(February-December, 1893.)

Quebec.

		Amount claimed.	Sums paid.	Remaining due.
\$1,879 71	\$6,320 66			
I.—BUILDING.				
200 00		\$ 50 00	\$ 50 00	
44 39		38 42	38 42	
268 18		200 53	200 53	
200 00		18 77	18 77	
451 16		535 00	535 00	
15 96		48 25	48 25	
200 00		82 64	82 64	
44 10		64 79	64 79	
690 00		39 55	39 55	
15 04		25 00	25 00	
150 00		161 57		\$ 161 57
65 75		275 60		275 00
22 00				
26 93				
90 00				
150 00		\$1,539 52	\$1,102 95	\$ 436 57
400 00				
II.—TOOLS AND FITTINGS.				
65 85		\$ 2 72	\$ 2 72	
6 35		15 30	15 30	
75 00		30 00	30 00	
4 31		1 30	1 30	
100 00		36 49	36 49	
195 56		11 55	11 55	
75 00		50 87	50 87	
8 24		15 00	15 00	
280 00		4 50	4 50	
60 00		1 00	1 00	
200 00		76 07	76 07	
11 99		7 50	7 50	
50 00		59 73	50 00	\$ 9 73
15 25		360 00		360 00
		3 10		3 10
		1 80		1 80
		163 27		163 27
		\$ 840 20	\$ 302 30	\$ 537 90
III.—GENERAL EXPENSES.				
		\$ 4 00	\$ 4 00	
		5 20	5 20	
		2 00	2 00	
		3 60	3 60	
		17 05	17 05	
		0 55	0 55	
		28 00	28 00	
		66 00	66 00	
		2 00	2 00	
		8 57	8 57	
		4 67	4 67	
		10 75	10 75	
		7 57	7 57	
		\$ 159 96	\$ 159 96	

ought forward having  
ount Dr. ought to read

\$6,288 89

\$ 31 77

31 77

## COMPETITION OF REGISTERED CANADIAN COWS.

No demand for admission was presented during the year 1893.

## RECEIPTS AND EXPENDITURES OF THE ASSOCIATION, 1893.

### RECEIPTS.

Grant to the Association .....	\$ 2,000 00
“ “ School (1892) .....	679 34
“ “ (on account, 1893) .....	1,320 66
A year's interest .....	0 00
Subscriptions received .....	1,079 25
Sales of reports .....	238 24
Various .....	77 30
Payment of Desautel's (N.P.) account .....	81 77
Special subsidy to the School .....	(\$50 and \$31.87) 2,031 60
Discount note (Danish separator sent back) .....	359 62
Grant for syndicates .....	1,000 00
Balance due to the Secretary-Treasurer .....	17 11
	<u>\$ 8,884 89</u>

### EXPENSES PAID.

Printing .....	\$ 130 12
Paper, stamps, etc. ....	285 16
Travelling expenses of Board .....	50 35
Grant and expenses of Convention .....	276 08
Salary of the Secretary-Treasurer .....	600 00
Purchase of books and subscriptions .....	44 42
Extraordinary expenses .....	208 22
Syndicates .....	1,788 17
Dairy School .....	5,247 40
Balance paid to the Secretary-Treasurer .....	164 97
	<u>\$ 8,884 89</u>

Audited and found correct.

St. Hyacinthe, 7th December, 1893.

(Signed) JOS. C. DESAUTELS.  
W. W. PICKETT.

### DEBTS OWING IN 1893.

Association: Note Choquette, bookseller .....	\$ 47 34
“ Subscription “Montreal Gazette” .....	6 00
“ Sénécal, printer .....	449 30
“ L. Brousseau, printer .....	35 00
“ “Courrier St. Hyacinthe,” copies .....	72 00
“ Parmalee, printer .....	10 50
“ H. S. Foster, Toronto Exhibition .....	196 96
	<u>\$ 817 10</u>

School: Note Dairy  
“ Lyma  
“ Raym  
“ A. Blc  
“ Canad  
“ F. X.

Syndicates: Saill Cc  
P. Macf  
C. Pich

Association  
School ....  
Syndicates

GENE

Debts paid .....

“ to pay .....

Total receipts .....

Uncovered balance .....

DIVISION OF RE

Association .....

School .....

Syndicates .....

Deducting the surplus

The real uncovered bal  
As already stated in  
over to the Assc

(1, 2) The difference b  
And that (acknowledg

That is .....

is derived from the  
expenditures of 1893, v



School : Note Dairy Supplies Co. ....	\$	360 00
" Lyman & Sons .....		3 10
" Raymond & Frères.....		161 57
" A. Blondin .....		438 27
" Canadian Rubber Co.....		1 80
" F. X. Bertrand.....		9 73
	\$	<u>974 47</u>

Syndicates : Saül Côté, payment of expenses and salary .....	\$	707 10
P. Macfarlane .....		119 12
C. Piché .....		5 00
	\$	<u>831 22</u>

RECAPITULATION.

Association .....	\$	817 10
School .....		974 47
Syndicates .....		831 22
	\$	<u>2,622 79</u>

GENERAL STATEMENT OF RECEIPTS AND EXPENDITURE.

Debts paid .....	\$	8,884 89
" to pay .....		2,622 79
	\$	<u>8,884 89</u>
Total receipts.....	\$	11,507 68
Uncovered balance (1).....	\$	2,639 90

DIVISION OF RECEIPTS AND EXPENDITURE BETWEEN THE ASSOCIATION, THE SCHOOL AND THE SYNDICATES.

	Receipts.	Expenditure.	Surplus.
Association .....	\$3,394 79	\$2,666 42	\$ 728 37
School .....	4,472 99	6,221 87	1,748 88
Syndicates .....	1,000 00	2,619 39	1,619 39
			<u>\$ 3,368 27</u>
Deducting the surplus of the Association.....			728 37
The real uncovered balance is (2).....			\$ 2,639 90
As already stated in note on page 179, the Commissioner of Agriculture has since paid over to the Association a sum of.....			2,600 00

(1, 2) The difference between this sum of .....	\$	2,639 90
And that (acknowledged page 179, note) of .....		2,622 79

That is..... \$ 17 11  
 is derived from the balance of the sum due to the Secretary-Treasurer for the receipts and expenditures of 1833, which figures in the balance of receipts (page 275).

OWS.

1893.

.....	\$	2,000 00
.....		679 34
.....		1,320 66
.....		0 00
.....		1,079 25
.....		238 24
.....		77 30
.....		81 77
.....		2,031 60
.....		359 62
.....		1,000 00
.....		17 11
.....	\$	<u>8,884 89</u>

.....	\$	130 12
.....		285 16
.....		50 35
.....		276 08
.....		600 00
.....		44 42
.....		298 22
.....		1,788 17
.....		5,247 40
.....		164 97
.....	\$	<u>8,884 89</u>

L.S.

.....	\$	47 34
.....		6 00
.....		449 30
.....		35 00
.....		72 00
.....		10 50
.....		196 96
.....	\$	<u>817 10</u>

TWELFTH ANNUAL CONVENTION  
OF THE DAIRYMEN'S ASSOCIATION OF THE PROVINCE  
OF QUEBEC.

(EVENING OF THE 5TH DECEMBER, 1893.)

*Dinner, offered as a testimonial of respect and gratitude, to M. J. de La Broquerie Taché,  
Secretary-Treasurer of the Association from 1882 to 1892, by the members of the  
Dairymen's Association and their friends.*

*Report of the Dinner offered December 5th, 1893, to M. J. de L. Taché by the  
Dairymen's Association.*

Monsieur J. de La Broquerie Taché, the first secretary-treasurer of the Dairymen's Association, having discharged during eleven years, from the foundation of the Association in 1882 to the convention of 1892, these important duties with a zeal, a devotion, and an intelligence beyond all praise, the directors of the Association thought it their duty to constitute themselves the faithful interpreters of the sentiments of all its members, by profiting by the return of the Association to its cradle, on the occasion of its twelfth annual convention, to offer to M. Taché, in his birthplace, a public banquet in testimony of esteem and gratitude for the great services rendered by him to the dairy industry of the Province of Quebec, and through it to the province at large.

The committee of organization consisted of: The Hon. P. B. de LaBruère, honorary president of the Dairymen's Association, chairman; L. T. Brodeur, J. D. Leclair and E. Castel, deputed by the Association, etc.; J. C. Desautels, M. St. Jacques, Ls. Lussier, J. B. Blanchet, W. W. Pickett and L. A. Choquet, deputed by the people of St. Hyacinthe.

The friends of the dairy industry and of M. Taché responded freely to the appeal of the committee: in a few days more than 250 accepted the invitation, and 224 persons were present at the banquet.

Being desirous of associating itself with this demonstration in honour of one of its children, the town of St. Hyacinthe placed at the disposal of the committee, for the occasion, the hall of the municipal council. Decorated with the national colors and brilliantly lighted up, the banqueting room, with its five tables gaily adorned with flowers and covered with the most appetizing dishes, presented a superb sight.

The principal table had for its chairman the Rev. Messire Th. Montminy, president of the Dairymen's Association, having on his right the guest of the evening,

M. Taché, and Dominion. Ar Dominion Com the Rev. M. Ch missioner of the president of the Barnard, Direct ing for the Don

After the c table to table.

Mr. President,

I regret ex. se M. J. de L. Taché

Pray accept prosperity of the the welfare of the

I am deeply i to advance along resources Divine l

May the Lord produce most abun

I join with al Taché during this success of dairying

M. EMILE

Sec

Sir,

I regret that a of attending the di

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This dinner is decree to my wortl

Accept the as to be,

M. Taché, and on his left the Hon. A. R. Angers, Minister of Agriculture of the Dominion. Around them sat: His Honour Judge Tellier, Prof. Jas. W. Robertson, Dominion Com. of Dairying; M. G. A. Gigault, Asst. Com. of Agriculture of Quebec; the Rev. M. Chartier, of the College of St. Hyacinthe; the Rev. M. Côté, agricultural missionary of the diocese; M. Laberge, Consul for the United States; Mr. R. Ness, president of the Dairy Association of Beauharnois; M. F. Dupont, M.P.; Mr. Ed. A. Barnard, Director of the *Journal d'Agriculture*, M. J. C. Chapais, Asst. Com. of Dairying for the Dominion, and Dr. J. C. Coulombe, M.P.

After the dinner was over a stream of sympathetic gaiety soon coursed from table to table. At dessert the secretary read the following letters of excuse:

ST. HYACINTHE, Nov. 28th, 1894.

Mr. President,

I regret exceedingly that I cannot accept your kind invitation to be present at the dinner to M. J. de L. Taché on the 5th prox.

Pray accept my best thanks for your attention, and my most sincere wishes for the prosperity of the Dairymen's Association, which has already produced results so encouraging to the welfare of the province.

I am deeply interested, believe me, in every measure calculated to cause our dear country to advance along the road of true and solid progress by means of the numerous and precious resources Divine Providence has entrusted to her care.

May the Lord, author of all good, amply bless your patriotic association, and enable it to produce most abundant fruits for the ease and happiness of our grand Canadian country.

I join with all my heart in the sentiments of gratitude that will be expressed towards M. Taché during this high festivity for the large share he has taken in the development and success of dairying.

I am, very sincerely, Mr. President,

Your humble and devoted servant,

† L. Z., Ev. de St. Hyacinthe

BISHOP'S PALACE, St. Hyacinthe, Nov. 28th, 1894.

M. EMILE CASTEL,

Sec. D. Ass., St. Hyacinthe.

Sir,

I regret that a journey on the affairs of the Bishopric will prevent my having the pleasure of attending the dinner in honour of M. J. de L. Taché.

I should have been happy to testify my sympathy with and admiration for him who, by his devotion and intelligence, has done so much for the success of the Dairymen's Association of the Province, and for the benefit of the farmers in general.

This dinner is an homage rendered to true merit, and I should like to take part in it to decree to my worthy former pupil the title of *Public Benefactor*.

Accept the assurance, Mr. Secretary, of the high esteem with which I have the honour to be,

Your entirely devoted,

† MAX., Ev. de Druzipara.

PROVINCE

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T. Brodeur, J. D.  
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QUEBEC, December 5th, 1893.

E. CASTEL,  
St. Hyacinthe.

Sir,

I deeply regret not being able to be with you this evening at the dinner to M. Taché. I, too, should have liked to add my testimony to his assiduous work and the success that has crowned it.

Unfortunately, the budget, and a division that none of us can stay away from, keep me here. Pray present my sincere congratulations to M. Taché.

LOUIS BEAUBIEN,  
*Com. Ag. and Colonization.*

QUEBEC, December 4th, 1893.

M. CASTEL,  
Sec. D. Ass., St. Hyacinthe.

Dear Sir,

To-morrow will open, at St. Hyacinthe, the annual convention of the Dairymen's Association. To-morrow, too, will take place the dinner to the former distinguished secretary of that body.

My official duties detaining me at Quebec, I shall not be able to be present at either of these celebrations; but be sure I shall in heart be with you all, regretting much that I shall not hear the so instructive discussions of our meeting, and show by my presence how much I, as president of the Society, have always appreciated the great services M. Taché has rendered to the dairy industry and the country.

Such men are rare, and we cannot do too much to show our gratitude to them.

Pray express my regret to the Board of Directors and the organizers of the banquet, and accept my wishes for the success of the functions of to-morrow and the following days.

Very truly yours,

BOUCHER DE LABRUERE,  
*President of the Legislative Council.*

QUEBEC, November 22nd, 1893.

MONSIEUR E. CASTEL,  
Sec. D. Ass., St. Hyacinthe.

Dear Sir,

I send you my subscription to the Taché banquet. I wish you all the success the grand idea deserves. Were I at liberty on that day, I would make it a pleasure as well as a duty to be present at the dinner.

Unfortunately, there is no hope of such being the case. I shall be firmly anchored to the House by official duties on that day.

Believe me, dear sir,

Truly yours,

P. EV. LEBLANC,  
*Speaker of the Legislative Assembly.*

QUEBEC, December 2nd, 1893.

E. CASTEL, Esq.,  
S. D. Association.

Dear Sir,

On my return from Chicoutimi I found, this morning, your letter and the invitation to the dinner to M. Taché on the 5th December. I should have been happy to be present at this fête in order to testify my appreciation of the great services rendered to agriculture by those who have so devotedly laboured for the progress of dairying; but I am detained at Quebec by pressing business, which prevents my leaving at present.

Pray accept my heartfelt wishes for the success of the banquet, and believe me,

Faithfully yours,

H. G. JOLY DE LOTBINIÈRE,  
*President of the Council of Agriculture.*

M. Bernier, M.P., not being able to attend the dinner to M. Taché at St. Hyacinthe, on the 5th December, begs the 'Dairymen's Association and the committee of organization to be good enough to accept his excuses.

4th December, 1893.

M. Brodeur, M.P., regrets very much that he cannot attend the banquet given by the Dairymen's Association to M. J. de L. Taché at St. Hyacinthe on the 5th of December, and begs the committee of organization to accept his thanks for the kind invitation sent him.

Montreal, Dec. 1st, 1893.

QUEBEC, 5th Dec., 1895.

EMILE CASTEL, Esq.

Can't leave Quebec; debates and divisions of importance this evening; congratulations to our friend Taché; shall be at St. Hyacinthe to-morrow, if possible.

McDONALD, CARTIER, M.P.P.'s

TOWN HALL, ST. HYACINTHE, Dec. 2nd, 1893.

The Dairymen's Association of the Province of Quebec.

The Mayor of St. Hyacinthe accepts with pleasure the obliging invitation to be present at the dinner to M. Taché on the 5th inst.

TOWN HALL, ST. HYACINTHE, Dec. 5th, 1893.

MONSIEUR E. CASTEL,  
St. Hyacinthe.

Dear Sir,

I am compelled to be away, so I cannot have the pleasure of attending the banquet given in honour of M. Taché.

Truly yours,

G. C. DESSAULES,  
*Mayor.*

ember 5th, 1893.

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BEAUBIEN,  
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Dairymen's Associa-  
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LABRUERE,  
*Legislative Council.*

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BLANC,  
*Legislative Assembly.*

KNOWLTON, Que., 25th November, 1893.

The Dairymen's Association and the Committee of Organization, St. Hyacinthe.

Gentlemen,

In reply to your invitation to attend the dinner to M. J. de L. Taché on the 5th December, I regret to say that my health obliges me to refuse it.

I heartily applaud the idea, and I share in the gratitude felt for the numerous and important services rendered by M. Taché to the agriculture of the province.

I have the honour to be, etc.,

H. S. FOSTER,  
*President of the Bedford Dairy Association.*

At a meeting of the members of the Farmers' Club of St. Lambert de Lauzon, and of the patrons of the creamery of that parish, held on the 3rd December, 1893, the following resolutions were passed:

Moved by M. Etienne Dussault, seconded by M. Pierre Lacasse:

It was unanimously resolved that MM. F. Pelchat and J. Paquet be selected to represent at St. Hyacinthe, the Creamery and Farmers' Club of St. Lambert de Lauzon.

Moved and seconded by the same, and resolved unanimously:

That the members of the club and the patrons of the creamery of St. Lambert de Lauzon acknowledge that M. J. de L. Taché, by establishing a first-class creamery in the parish, has deserved the gratitude of the farmers of that place.

2. That dairying, which has already done a great deal of good in the province at large, and in this parish in particular, owes its success in great measure to the intelligent labours of M. Taché.

A copy of the original is enrolled in the archives of the Farmers' Club.

St. Lambert de Lauzon, December 3rd, 1893.

F. THEO MÉTHOT,

The reading of these letters being finished, the Chairman rose and proposed the health of

HER MAJESTY THE QUEEN.

The whole party, drank the toast standing, and, most heartily sang

GOD SAVE THE QUEEN.

The next toast was

THE PRESIDENT OF THE UNITED STATES.

Gentlemen:

As president the pleasant duty is the health of our necessary that I share in the province of the numerous services rendered particularly.

I have, then,

Mr. Chairman and

I am not accustomed to many persons, who are puzzled how to tell me this evening in my presence. I see among my companions, of my colleagues, whose presence there are showing their sympathy with me, whose manner of which I am that he still regards me as due to all, since satisfied with the matter.

But, Gentlemen, this celebration soon

And, on this occasion a demonstration of opportunity was a

The opportunity several years through its birth-place; it was an establishment; no Chicago Fair for it result of our commu-



## OUR GUEST.

PROPOSED BY THE CHAIRMAN.

*Gentlemen :*

As president of the Dairymen's Association and Chairman of this banquet, I have the pleasant duty of proposing the toasts. The most important toast of the evening is the health of our guest. The labours of Mr. Taché are too well known for it to be necessary that I should enumerate them to you. All those who know him—and who in the province does not know him?—all the true friends of progress can appreciate the numerous services he has rendered to agriculture in general and to dairying in particular.

I have, then, the honour to propose the health of our guest, M. Taché.

REPLY OF M. J. DE L. TACHÉ.

*Mr. Chairman and Gentlemen :*

I am not accustomed, and for a good reason, to be set up as a gazing-stock to so many persons, who seem to be thoroughly inclined to embarrass me, and I am rather puzzled how to tell you to what degree I am touched by the demonstration made this evening in my favour. I must express my deepest gratitude to all who take part in it. I see among them a great many of my fellow townsmen, of my childhood's companions, of my fellow students, whose kind friendship is vouched by their presence. There are, too, among them numbers who are present for the purpose of showing their sympathy with an association of which I was secretary for ten years; colleagues, whose zeal and devotion in the promotion of the success of this association have never faltered. Again, among them I see the Hon. the Minister of Agriculture at Ottawa, whose presence here this evening reminds me in a very delicate manner, a manner of which I am very conscious, that he has honoured me with his confidence, and that he still regards me with kindly feelings. My gratitude and my sincere thanks are due to all, since I must feel that this banquet is meant to show that you are satisfied with the manner in which I discharged my duties while secretary of our Association.

But, Gentlemen, you would have indeed done too much, if I did not perceive in this celebration something beside a subject of personal gratification.

And, on this subject, I remember that, when I was informed that the honour of a demonstration of this kind was being prepared for me, some one observed that the opportunity was a good one.

The opportunity in question, Gentlemen, doubtless was that, after a tour of several years through the province, our society was about to return to St. Hyacinthe, its birth-place; it was this convention we are now holding ten years after its first establishment; no doubt, it is also the splendid triumph our province won at the Chicago Fair for its dairy products, a triumph which we may fairly claim as the result of our common efforts to render efficient the labours of our Association. I was

in a measure compelled to accept this banquet, because it is not only a very flattering testimony in my favour, but also a mark of appreciation of the labours of a great number of persons, who, having taken so much trouble, were entitled to share in the honour.

So much so, is it, that all question of vanity apart, I feel rather in the position of Lafontaine's ass, that was loaded with relics. The relics are the labour, the success of your association; and, in face of the honours you are heaping upon me, I hasten to assign to each his own share of the praise, so that I may not be absolutely like the ass, who accepted everything as his by right.<sup>1</sup>

Let us say, in the first place, that whatever our association may have harvested, the seed had been previously sown by others. When it was founded, in 1882, there were in existence more than 300 cheeseries and a few creameries, already making the fortune of parishes in which either the one or the other had been established. The campaign, that they started, had been inaugurated in 1870, by Mr. Ed. A. Barnard, whom I see before me, and continued afterwards by people who had the power of discriminating in what direction the true interest of their country lay. These men were the pioneers of the dairy industry.

The government of Quebec, of which our present Lieutenant-Governor was the premier, had officially submitted to the chambers, in a speech from the throne, in 1879, the policy of encouraging dairying, and, strange to say, the opposition did not find much to say against it.

The same government of Quebec, still under the inspiration of Mr. Barnard, had founded, in 1881, the school factory for cheese and butter at St. Denis. It had aided, in 1882, the school factory for butter at Ste. Marie de la Beauce, under M. Barré, who had just returned from a tour in Denmark, whither he had gone to study the art.

The *Journal d'Agriculture*, or rather Mr. Barnard, had, for nearly 20 years, without fear, if not without opposition, preached the good tidings of improvements in farming; and, under his breath, the ferment of sound theory had laboured hard to slay the microbe of routine.

The Farmer's Club had, in our clergy and others, devoted apostles like you, Mr. Chairman, and the spirit of parochial association, applied to the study in common of agriculture and its conditions of success, was in full bloom.

All this work, then, was done in the field that lay most immediately before us; other circumstances aided to render our success more easy. Everywhere, when there was no confidence placed in dairying, the question was asked: What can we do with our farms that, under the drain of a ruinous routine, keep on decreasing their output.

The grand discovery of ensilage passed over from Europe to America and seized upon the attention of the public.

As regards the making of cheese, if the phrase, "French cheese," had not been

<sup>1</sup> If my memory serves me, the ass took to himself the bows and genuflexions intended for the relics.—A. R. J. F.

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then invented, still rather too much of the sort of goods implied by the phrase was being sent out, and it was felt that there was still improvement to be made. As to butter, the recent invention of centrifugal separators had made the establishment of creameries as easy as that of cheeseries had previously been.

To serve as guidance in the management of our association, we had before us the example of our sister associations in Ontario, which had already made the goods of that province very much better than our own.

Under such conditions, the opportunity of our association arrived; when one has one's road drawn out, success is almost always secured, and, as I said, it was so with us.

We set to work to awake the attention and collect the scattered forces of the country. We got together large public meetings, and we "talked farming." If, at our meetings, we treated a crowd of farming matters, it was not so much with a view to go deeply into them as to point out to the public the advantages of dairy farming, to explain that in it, as in other things, there is much to be learnt, many means of making farming profitable; not so much, either, with an intention of offering to the public valuable assistance, as with a view to inspire with a little more confidence in themselves a crowd of useful citizens, whose practical experience and good sense but too often lie hid, like the light in the Gospel, under the bushel. Lastly, it was to show that the ordinary farmer might introduce on his land, even with little capital, but that little well managed, improvements borrowed from the practice of other countries, where farming is more advanced, and which but too many of our people do not investigate under the pretext of not having means to carry them into effect. From all these points of view, the Association, to extract its riches from our soil, riches insufficiently known, has played the part of the miner.

While discharging this modest duty, the Association has implanted in our midst the system of ensilage; it has aided the improvement of breeding stock; it has endowed the province with the Canadian herd-book; it has diffused the idea of the Farmer's Club, whose expansion in our province has just been manifested, thanks to M. Gigault's bill, another friend to our association, who is present this evening, and to whom the public is indebted for having found means to cause to spring into life 400 clubs in a single year.

But the development and improvement of these products of milk, *i.e.*, butter and cheese, were the more immediate aim of our society, the main reason for its existence.

By making our meetings perambulate the whole country, we have brought about the extension of the dairy industry. Instead of the 300 and odd factories of 1882, the province now has more than 900 cheeseries and about 200 creameries, and the annual production of these factories now exceeds \$5,000,000!

As regards the teaching of the best methods of manufacture, we followed in the footsteps of the sister societies of Ontario during the first years of our existence; we next improved their system of inspection or instruction at the factory,—at the home, (*domicile*) if desired,—and stage by stage, we established a regular organization of

creamery and cheesery syndicates, the first and only one of the kind in the whole world.

To cause our syndicates to work efficiently, we had to form our inspectors, and to accustom the makers to accept the authority of the Association; the creation of a school, too, became necessary.

On the 5th of September, 1892, the first spadeful of earth was raised, and in the following December our school received the first series of the 200 students who attended the courses last winter.

We are only at the beginning of the results that we shall reap from this establishment of creamery and cheesery syndicates. If we compare what will result from it to that which we have already gained, we have only as yet done preparatory work; the tree has grown, but the first fruit only was gathered at Chicago.

Our friend, Mr. Foster, must be mentioned as having the honour of having founded and put into operation the first cheesery syndicate in the province, and since I am relating the share taken by all those who traced out the road for us, our friend, Mr. Macpherson must not be forgotten. We have applied in our syndicate, composed of factories belonging to different proprietors, the method of inspection that created the reputation of his "Allan Grove" cheese.

The first year of their regular working, ten organizations were created in the province; in 1892 there were 14, and this year the latter figures were doubled, *i.e.*, there are now 28; which is to say, too, that more than 600 factories in this province are now under the immediate supervision of 30 inspectors, holders of diplomas from the Association.

But our Association has not limited itself to action in this province, with due deference to our neighbours, who, when they mention the Province of Quebec, have never a pleasant note to intone. It was our society which, following the advice of our friend and former director, Mr. Lynch, whose letters we published in pamphlet form; it was our society, I say, which, in 1888, proceeded to Ottawa for the purpose of creating a Dominion Dairymen's Association. One of our first recommendations at that meeting, composed as it was in great part of our friends from this province, was to establish a *Dominion Commissionership* of Dairying, and this initiative on our part gained for our country the invaluable services of Professor Robertson, to whom we are indebted for the high position we occupy abroad, and is also assured to the French-Canadian districts of the Dominion the advice and enlightened supervision of M. Chapais, the Assistant Dominion Commissioner, and our most faithful lecturer and friend. Moreover, the Federal Commissionership now holds under one and the same superintendence, the dairy interests of the entire country.

There, in a few touches, is the organization we have created; every one has contributed to its establishment, to the working of this mechanism, and owing to the disinterestedness of a Board of Directors working for the public good, without direct personal interest, since the secretary alone of the association received a salary, the public has become accustomed to see a friend in our society, and has raised it with full trust to the position it now holds.

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Are more valid proofs required of this confidence than the splendid list of members that our new Secretary, Mr. Castel, has obtained during 1893? We have now on our roll 1,079 subscribers, two and a half times as many as the three dairy associations of Ontario have together.

We now make, in many parts of the province, cheese equal to the best made in Ontario.

Our butter, both in quality and quantity, is superior to that produced in Ontario.

The improvements in our farming are striding onward with giant steps. A profound agricultural movement runs through our whole population.

Such is our past, Gentleman, and it is the result of the labour of all the devoted members of our association; if you are content, even proud of it, I can only rejoice with you.

But let us not stop there.

The future smiles on us, we enjoy the honour and advantage of having at the head of the departments of agriculture at Quebec and Ottawa, two French-Canadians, who, among other qualities that you observe in them, possess the enthusiasm of the Frenchman and the persistence of the Englishman.

Their presence among us is a pledge that we can reckon, in everything and everywhere, on the realization of the fair expectations that the association can hope for from their promotion to the ministerial posts over which they preside. Were I permitted to mingle my personal recollections with this demonstration, I could tell you that I have in the past already defrauded one of them, for five years, of a good share of the time I have devoted to our society; as to the other, he seems to think that we never have time enough to give him to occupy himself with the dairy industry.

These Honorable Gentlemen are surrounded in the administration of their departments by men who are worth their weight in gold, and who are our warmest friends.

Robertson and Chapais, at Ottawa; Gigault and Barnard at Quebec; such are the chiefs of the dairy industry.

We have men of remarkable talent at the head of our school; inspectors well up in their business and devoted to their fellow citizens' interests; in Monsieur Castel, we have an active, intelligent secretary, given up to his work. By our organization of syndicates, we are in direct and constant communication with the factories in every corner of the country.

Such is the state of the organization of our dairy industry.

As to our trade, it is true that we supply to England nearly 12 million dollars' worth of cheese, but even that is only 45 per cent. of what she imports, and the balance of 55 per cent, is a pretty vacuum to fill up (*une jolie timbale à décrocher.*) (1)

Of butter, England imports nearly 60,000,000 dollars' worth a year, that is two and a half more than of cheese, and we hardly supply her with 2 or 3 per cent. That is to say

(1) Literally: "a pretty kettledrum to unhook."

that 2,000 creameries (instead of the 200 we now have) would hardly furnish England with an amount of trade in butter proportionate to our exportation of cheese.

The field, over which all our efforts are spread, presents to us many encouraging prospects. To work then; we have with us the sympathies and the active aid of the authorities of this country, of the men who think and discern. Our clergy give us lectures, distinguished specialists and zealous persons, as indefatigable as they are able; the men of the professions and the magistracy itself give us all their sympathy and often their active assistance. Our representatives have their whole hearts enlisted in our cause, and support all our requests. Forward then, and let our exertions attach Canadians to their country, by giving them abundant profits for the time and care they devote to dairy-farming.

In preparing his monster cheese of 22,000 lbs. for Chicago, Prof. Robertson exhibited a stroke of genius. A person from the West of Canada, thinking to make a joke, said that he might as well have an enormous sausage made. But we, Gentlemen, may differ from this opinion. This big cheese is to be looked upon as an emblematic device; we must strive to show that dairying in Canada dominates that of all other countries as much as the giant cheese, at Chicago, dominated the little cheeses of the States or other countries.

To England we owe a kind of atonement; I was reading the other day an account how that, in reply to the demand of Henry III. of England to restore Normandy to him, Louis VIII of France replied: "I will not yield an inch of soil *nor the value of a cheese*"!

Be it the part of La Nouvelle France, Gentlemen to palliate the pungency of this reply from one of the ancient kings of *La Vieille France*. (A. D. 1224, A. R. J. F.) Let us flood England, not only with our cheese but with our butter too, and, whatever the Bristol Chamber of Commerce may think, let us show them that we can turn out quality as well as quantity.

And now, Gentlemen, I offer the expression of my gratitude and of my most profound and heartfelt thanks to the organizers of this grand demonstration as well as to all who have taken part in it, whether present or absent. (*Repeated volleys of applause.*)

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### CANADIAN FARMING.

TOAST PROPOSED BY MR. JUSTICE TELLIER.

*Mr. Chairman and Gentlemen:*

The toast proposed by the Chairman was welcomed with most enthusiastic applause, and no wonder, considering it was addressed to a meeting like this, got up in honor of one of the benefactors of agriculture, and composed of persons who attach the highest importance to this art. Of all the callings and occupations of man, the first in order of time, and in the order of nature, was agriculture, as it is also the first

the Almighty en- need of food and and cattle reared of the first man s men, as they form not necessary to it is the same as food needed for h the surest means this art, which civilization.

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In our countr- elements, form th- home and foreign, workmen, artisans- population consur- devote themselves of their intellectus Immense progress genuine triumph a

the Almighty enjoined to man, even in his state of innocense. After man's fall, the need of food and clothing imperatively required that the earth should be cultivated and cattle reared. These two were the first employments that the two elder children of the first man shared, and which, for many ages, became the occupation of the first men, as they form the occupation of a greater number of their descendants. It is not necessary to explain the necessity and utility of farming and stock-breeding, as it is the same as those of food and clothing. Agriculture by bestowing on man the food needed for his own existence and that of his family, offers him at the same time the surest means of securing his prosperity; thus, we see all people holding in honour this art, which is the foundation of all others and the chief corner-stone of civilization.

The sacred laws of Zoroaster attached a kind of sanctity to the occupation of farming. As to the high importance the Romans attributed to it, we cannot doubt, since we see that out of the ranks of the farmers they sought for their consuls, generals, dictators, who knew how to brandish a victorious sword, or how to hold the reins of government in the same hands that previously guided the plough.

Had agriculture not been carried on so as to produce more than was required by those who practised it, not only would every other art have been arrested, but all knowledge and all that marks the improvement of the human race would have also been neglected. When the faculties of man are absorbed in supplying the wants of nature, and by compulsory labour, too, he can neither develop nor display those intellectual faculties, by which he is so preeminently distinguished in times of more advanced civilization.

It is only when the means of subsistence are plentiful, when the work of one portion of the population suffices to supply the wants of all, when a considerable proportion of society is above the necessity of working with their hands to obtain the necessities of life, that the mind of man can exercise its faculties and show what it is capable of and all that it can do. Compulsory manual labor and the exercise of the intellect seem incompatible, when the existence of the individual depends upon them. It is only since the art of agriculture has been thoroughly understood and the food of the human race assured without the manual labor of everyone being needed, that man's mind has been developed, and the other arts and sciences successfully cultivated.

In our country, agriculture and stock-breeding, which is one of its necessary elements, form the chief source of our national wealth. Farming furnishes commerce, home and foreign, with a vast variety of goods for consumption. Numbers of farmers, workmen, artisans, etc., are by it provided with work. It produces more than the population consumes. By its existence other classes of the people are at liberty to devote themselves exclusively to the business of their professions, to the development of their intellectual powers, and to cultivate with success the other arts and sciences. Immense progress has, in the last few years, been made in it; thus, it obtained a genuine triumph at Chicago. At this competition, thrown open by the great American

Republic, many of its products won so many prizes that hardly any remained for others. It obtained immense advantages for Canada, and at the same time ministered to its pride and glory. And on this account, it has the right to count on the gratitude and devotion of the population. Many friends it has who, like M. Taché and many other distinguished men, are working with energy to raise it to the highest degree of perfection.

I have the honour, then, to propose the "Health of Canadian Agriculture."  
(Cheers.)

REPLY BY THE HON. A. R. ANGERS, *Minister of Agriculture.*

*Mr. Chairman and Gentlemen :*

You have quite taken me by surprise in asking me to reply to the toast of "Canadian Agriculture." Peasants, like us, are little versed in letters, we do not possess the gift of eloquence. We know better how to take hold of the stils of the plough than to deal with the difficult art of oratory, and I must confess that I feel myself greatly embarrassed before a subject so vast as the one you have assigned to me. It would be all very well, if you had restricted yourself to asking me questions on the way of drawing out furrows or on any other point of practical agriculture ; but as for embracing at once a subject so general as that of Canadian farming : frankly, I cannot do it.

Encouraged by your kind reception, I shall merely tell you that I was very anxious to be present at this meeting. I remembered the courtesy with which, five years ago I was received at St. Hyacinthe, and I said to myself, that if they had received me with honour in the post I then occupied, it would still be with kindness that they would receive me in my new position to share in their rejoicings. (*Loud cheers.*)

A second motive led me to come ; I wished to return to the farmers of St. Hyacinthe, Nicolet, and Richmond the visit they paid me, last summer, at the Central Experiment farm.

That visit, and others similar to it which preceded or followed it, have impressed me with the great appreciation farmers have of the work of the government-farms.

And if they owe a debt of gratitude to the government for the establishment and maintenance of these farms, they are equally indebted to him who is now seated at my side : I mean Mr. Gigault. He was the father of the experiment farms ; I am only their sponsor. It would be he, this evening, whose duty it would be to carry the infant to the font, and not I ; had it not been the custom that, in such ceremonies, the father always yields precedence to the godfather. (Cheers.)

Gentlemen, in the present day, the farmers and farming are rising to the surface. Farming is no longer a simple business of manual labour ; it is a profession on a level with any other. A farmer can no longer rest contentedly in ignorance. To

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farm successfully and preserve his position, he must devote himself to study. If the greater part of his time must be given up to work on his land, he at least finds within reach clubs, like those that you have been telling us about, and institutions like the Dairymen's Association. There, he meets with men who for months and years have been studying agricultural questions; men who invite the farmers to listen to them, and who, in a few hours, make him as well-informed as they are themselves. (Cheers.)

Agriculture, then, is no longer what it was: the refuge of the ignorant. Science is enlightening and enlarging its horizon. All acknowledge this. And see how the members of the liberal professions are studying agricultural questions; why, some of them have pushed their ambition so far as to keep four or five cows!

You remember the alchemists, those people who searched after the philosopher's stone, the power of converting the viler metals into gold? They, in mysterious ways of their own, entered their laboratories clandestinely in the night, and worked there with closed doors. During centuries they vainly sought the philosopher's stone. But in this our day, a novel kind of alchemists has appeared. These do not work in darkness, and they have found the stone. They have not shut themselves up secretly in their sombre laboratories, but in the full light of day they travel from village to village, calling together the whole population, revealing their success, how to produce abundant crops, and how to manufacture goods of the finest quality. They say to the farmers: we have found the philosopher's stone; do not try to change pewter, copper, brass into gold; take milk, heat it in such or such a way, under such or such conditions, and from it you will extract butter or cheese of the best quality. This is, indeed the true philosopher's stone! These alchemists, Gentlemen, need I name them? They are the diffusers of the dairy-industry. (Prolonged cheers.)

Two years ago this philosopher's stone, the dairy-industry, produced \$9,000,000 for the Dominion; last year it produced \$11,600,000; and I may tell you, in confidence, that the figures of the last balance-sheet will show an exportation for the year ending last July 1st, of \$13,400,000 in cheese alone. (Hearty cheers.)

Is there in our country any other business that makes such rapid progress, that advances by leaps and bounds of two millions a year?

Mention has been made of the success won at Chicago by our dairy goods. We have not yet received the official report, but, from a sufficiently authentic source, we know already what a triumph there is for us.

At the June competition 567 cheeses were exhibited, of which 162 came from Canada. For Cheddars 138 prizes were awarded, and out of that number Canada was satisfied with taking 129, leaving to the United States, with its population of sixty-five millions of souls, nine prizes! Again, at this competition, Canada carried off 31 prizes before the United States got one!

At the October competition 606 cheeses were shown; of these 524 were of Canadian make.

Of prizes for cheese made before 1893, 110 prizes were awarded; Canada had all

these to herself; as the States' makers did not think it worth while to show. For cheese of 1893 414 prizes were awarded; out of these 360 went to Canada, and only 45 to the States. Here, again, the States only succeeded in winning one prize when we had won 130.

In short, in these two competitions, the States exhibited 586 cheeses, and won 54 prizes; while Canada exhibited 687 cheeses and carried off 607 prizes.

I need not, I think, distinguish between the number of prizes won by the different provinces. Quebec is satisfied with her success, and views with pleasure the good fortune of Ontario. Is it not the competition with the latter province that has induced Quebec to make this grand effort, and has brought her into the foremost ranks?

In butter, we showed at Chicago a very much smaller number of samples. Still, in the June competition, Quebec took 10 prizes and Ontario only 3; in October Quebec won 16 awards, Ontario 9. With pleasure, I attribute a share of this success to the assiduous labour of my friend, M. Taché. You all know how much energy he has devoted to the development of the butter industry. And wisely so, I think.

Has not butter, up to the present time, been rather left in the background? I stated just now that we had exported this year \$13,400,000 worth of cheese, *i.e.*, 50 per cent. of the importation of that commodity into Great Britain.

But, as to butter, we only furnish England with 2 per cent. of her importations. Is it not high time that we should reestablish the equilibrium of these two sister-industries a little? Surely they could both flourish side by side without injury to either.

Your attention, I see by the reports of the Association, has already been called to this point. There are certain districts, certain herds that yield a milk particularly rich, and which, in consequence, is better suited to making butter; while milk furnished by other herds, less rich than the others, is still rich enough for making the best cheese in the world. Let us, then, keep on making cheese, but, at the same time, be wise enough to profit by conditions favorable to butter-making when they offer themselves.

You know, gentlemen, what it was formerly that the *habitant* loved best after his wife and children: it was his horse. His best keep, the larger part of his crop was for his horse, or rather for his horses, for if he had several grown-up lads at home, each of them had to have his "swell" horse to drive his "best girl" about on Sunday. (Laughter and applause.) That did not make us farmers any better off; we paid too much attention to our horses. But, now, our affections have changed their object; they have been transferred to cattle, which have become a source of wealth to Ontario, Quebec and the Maritime Provinces.

It is useless for us to try any longer to grow wheat in competition with Manitoba and the North-West. Providence has made these lands the Egypt of Canada. They are fertile, and so easy to cultivate that the ploughman there does not wearily drag after the plough, but sits on it as in a carriage. In favourable seasons

the yield is very those of Manitoba grain crops, with elements needed conduct, adopt a common sense.

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the yield is very great. Our farms on the St. Lawrence were formerly as rich as those of Manitoba, but we have scourged them to death; by growing a succession of grain crops, without ever returning anything to the soil, we have robbed it of all the elements needed for the growth of the cereals. We must now follow another line of conduct, adopt a less exhaustive form of cultivation, one more in accordance with common sense. This is the dairy-industry, which, with the Canadian cow, will restore fertility to the soil, and render us all prosperous.

The Canadian cow, hardy, acclimatized as she is, is equal to the best breeds of the world. If we try to restore to her, in all their purity, the characteristics that distinguished her in her early days; if we feed her, lodge her, treat her properly, she will prove a greater source of profit than the Hereford, the Ayrshire, or the Jersey. She eats less than the Hereford, makes less beef, but gives more milk. She is not delicate, sickly, like the Jersey, and her milk is richer than the Ayrshire's.

So Prof. Robertson, by my orders, has just bought, for the Ottawa Experiment Farm, fourteen Canadian cows, brought from Baie St. Paul. Why from that place rather than from any other? Because in that nook of the county of Charlevoix, far from all the great routes of communication, the Canadian cow has been preserved in her native purity, with all her primitive good qualities.

If it is not easy, gentlemen, for a *habitant* to speak on a matter he hardly knows anything about, it is still more difficult for him to know when to stop. You see that, in regard to this, I am completely a *habitant*. I will not sit down, however, without having offered to my friend, M. Taché a testimony of esteem, and without telling him publicly how highly I appreciate the patriotic work to which he has devoted himself. He told us that during the time he was my secretary, he stole many an hour from his duties to devote them to the dairy-industry. I am proud of having given M. Taché all the liberty he required to allow him to work at his favourite occupation. I knew to what generous task he was devoting his time. I regretted his leaving me; I did all I could to get him to follow me to Ottawa. For five years he served me faithfully at Quebec, and I should have been glad to have retained his services at Ottawa, as long as the country shall have need of me there. (Prolonged applause.)

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#### REPLY OF M. G. A. GIGAUT.

*Mr. Chairman and Gentlemen:*

In a telegram read to you, the Hon. Louis Beaubien, Commissioner of Agriculture, regrets that he cannot be here to express to M. Taché his thanks for the signal services he has rendered to dairying and to the agriculture of the Province of Quebec.

Allow me to express another regret: it is that, owing to this circumstance, I am forced to improvise a speech.

My name was not on the list of speakers, and when you invite me to address



you, you impose upon me a heavy task. This superb demonstration, the sentiment of gratitude that presided at its organization, the good M. Taché has done, ought to be sufficient to inspire me with thoughts worthy of being put into words, were it given me to be an orator.

It has been often said that he who makes two blades of grass grow, where only one grew before, is a public benefactor. If this be so, what expression should we employ in recognition of the merit of one who, by developing our dairy industry, has added millions to the yield of our agriculture? This merit is M. Taché's. If he has done much for the material benefit of our farmers, he must feel to-night that he has not laboured for the ungrateful. For, indeed, it is not usually among the farmers that ingrates are to be found.

Our rural communities have all been, and always will be, the home of good feelings, as they are of morality.

It is this that urges us to oppose the depopulation of the country for the benefit of the towns. Not that we are jealous of the growth of the towns, but because we are convinced that if we wish to form, as time goes on, a powerful and prosperous nation, we must above all things labour for the prosperity of our rural districts.

Monsieur Angers, the Minister of Agriculture, and M. Taché, have been good enough to refer to my past life; in their kindness they think that even I have been of some use to the farmer. It is pleasant to me think that institutions, to the creation of which I have contributed, have been able to assist the agricultural population, and I am delighted to know that it is so.

M. Angers calls me "the Father of the Experiment-farms." When I see the good they are doing, and that their officers, Messrs. Sanders, Robertson and Chapais, are doing, I must confess that one of the pleasantest recollections I retain of my political career is that of the efforts I made for the establishment of those farms. I represented an agricultural county, and in acting as I did, I simply fulfilled the duties of the office that my fellow-countrymen had entrusted to my care. As to M. Taché, no public office obliged him to work for the development of the dairy industry. The good that he has done he did from pure devotion to the cause, and with a disinterestedness that does him honour. In his speech, M. Taché was good enough to say that I had contributed to the creation of the Farmers' Clubs. What I did in this way was very little; the whole merit of establishing these associations is due to M. L. Beaubien. Others, before last session, had conceived the idea of organizing farmers' clubs; in a report, made in 1888, M. Chapais advised their creation.

As was so well said by M. Angers, farming is a profession, standing on the same plane as the liberal professions. The members of the other professions, notaries, physicians, lawyers, all attend establishments of the higher education, where are given lectures for their proper instruction in their future duties. Farmers, too, needed institutions for their instruction and information, and this gap was filled up by the creation of the clubs, which, I doubt not, will contribute to the diffusion of agricultural knowledge and improve the position of the farmer.

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Thanks to the institutions we possess, and to the devotion of the officers and members, Canadian agriculture is improving. The success of our province at Chicago proves that, as regards cheese, we possess *quality*; what we now need is *quantity*. According to the last statistics, we find that, in 1890, the production of cheese in Ontario exceeded ours by five million dollars.

This difference is humiliating to us; we must make it vanish. This we can do through the aid of the Dairymen's Association and our agricultural societies, if they work together to extend the growing of fodder-plants and root-crops.

If it is admitted that cattle are the basis of the agricultural prosperity of a country, it is our duty to increase their number, and to develop the production of the food they need.

Lately, I visited the Province of Ontario. There I met with many farmers who gave me much useful information. On every farm I went over I saw large fields of roots. With such farming as this, we can easily see how Ontario has succeeded in making so large a quantity of cheese.

Let us imitate that province by extending the production of fodder-crops, and we shall be able to increase the number of our cattle, and, consequently, the production of butter and cheese.

The demonstration of this evening will prove to the country that agriculture is held in honour in our province, and that we know how to recognize the merit and services of those who work to develop it. It will also have the effect of encouraging us to make greater sacrifices to hasten the progress of agriculture.

From the summit of the Alps, the most illustrious French general of this age, to encourage his troops, showed them one day, at the foot of those mountains, the fertile plains that would be the reward of their bravery, if victory crowned their flag.

This evening, placing themselves at the point of view of our dearest interests, our Minister of Agriculture and the staff of the army of agriculture invite us to march to the conquest of millions, which will be the reward of our love of work, if we devote our energy and devotion to the cause of agriculture. It depends entirely on ourselves to realize the brilliant expectations these speakers have called into life.

The future of our people depends upon the effect of the development we shall give to agriculture.

Let every one do his best, and we shall succeed in greatly increasing the products of our agriculture; we shall put a stop to emigration; we shall increase our population, and insure to our province the influence that is her due at Ottawa as well as at Quebec. (Loud applause.)

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 THE DAIRY INDUSTRY AND THE ASSOCIATION.
 

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TOAST PROPOSED BY DR. COULOMBE.

*Mr. Chairman and Gentlemen :*

I must tell you, in all humility, that I was far from expecting the great honour you have done me in asking me to address you this evening. I the less expected it, because the learned and distinguished men, to whom it belonged to speak, must, it appeared to me, tell you everything that it would interest you to hear. After having attentively listened to them, I find that I had not deceived myself, and this redoubles my embarrassment. But since the subject is agriculture, since it especially concerns dairying, I think it not needful to hunt after pretentious phrases to invite your indulgence. It is enough to cast a backward glance; it is sufficient to show the progress our agriculture, and especially our dairy-farming, has made during the last five years, to become interesting. For, indeed, I think we have a right to grow proud of our success, if we consider that, not alone in the old districts of Montreal and Quebec, but as far off as the most remote region of the Saguenay, the dairy-industry is so flourishing that, in the space of only a few years, the whole Province of Quebec has been, in this regard, completely metamorphosed. This is a fact; we everywhere find the good effect produced by dairying; wherever we find this pursuit has been introduced, we there find the farmers at ease and prospering.

But by this I do not mean to say that all that is possible to do has been already done. There are still many improvements waiting for introduction, many defects still exist in the working of some of the factories; but this is an affair of time, and I trust that with all the efforts of our Association at work, we shall shortly see the whole of these blemishes disappear.

At all events, the results obtained at present, the so numerous successes acquired in our factories, and above all the success of our industry at Chicago, are enough to make us drink with enthusiasm to the health and prosperity of our dairy-industry, to the past and future of our Association. (*Prolonged applause.*)

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 PROF. ROBERTSON'S REPLY.

*Mr. President and Gentlemen :*

I thank you for the enthusiastic manner in which you have responded to the toast of the 'Dairy Industry' and the 'Dairy Association' of the Province of Quebec.

I desire to acknowledge the honour which you have conferred upon me in associating my name with this toast, and in inviting me to respond in its behalf.

We find ourselves this evening gathered under very happy auspices to do honour to a distinguished gentleman who has done much to advance the dairy interests of

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this province, and to bring the efforts of the Dairy Association to most valuable issues in promoting the prosperity of the Province of Quebec.

Speaking, not only in response to the sentiment of the toast as it affects this province, but as a representative of the dairymen of the whole Dominion of Canada, I desire to offer my humble and earnest tribute of esteem for our honoured and distinguished guest, and of appreciation of the most excellent and patriotic work he has accomplished.

While I had some slight acquaintance with Mr. Taché previous to the holding of the first convention of the Dominion Dairymen's Association, at Ottawa, in 1889, I there had an opportunity of observing his splendid ability for organizing and pushing movements for the public good.

It may not be known to some of you that Mr. Taché was the first Secretary of the first Dominion Dairy Convention held in Canada. Out of that convention has grown a great deal of the thoroughly practical and helpful work which has been done through the *Dairying Service* of the Department of Agriculture in all the provinces of the Dominion since that time. To Mr. Taché belongs no small share of the credit which is due to the public-spirited men who initiated the movement when it was much less popular than it is at the present time. For ten long years Mr. Taché was the tireless and unselfish Secretary of the Dairy Association of Quebec, which has done so much to develop the resources of the province and benefit the people of the country.

Few of the movements, which in their later stages develop wonderful benefits to the people, are recognized in their beginnings as having great power of service. It is very easy to join in the celebration of great achievements when they have been almost completed. The heroes among men are those who persistently and quietly further the progress of all good causes, even before the general public perceive their drift. Out of the energetic actions of our honoured guest of this occasion has grown the institution known as the Dairy School of St. Hyacinthe. I predict for this Dairy School and Station a very useful place among the educational institutions of this province. Although Mr. Taché is still a young man, to him in a very large measure belongs the credit and honour of having this institution located in this thriving town. The quality of the service which has ever distinguished the actions of Mr. Taché is common to most men who render great service to their fellows. In this connection let me remind you that while a fit man is always fitted for a great crisis, the fitting of the man is usually accomplished in the humbler walks of life, where he trains himself and is trained to do the duty of the hour faithfully.

While David slew Goliath on the plains in front of two vast armies and covered his name with eternal renown, it should not be forgotten that the youthful warrior learnt his art and fitted himself for this glorious act of service by faithful attention to duty, and his care over the flocks and herds on the green hillsides of the home farm. The youth who, all unarmed, was willing to render the service required of him by the dumb animals under his care, in the rending of the bear and the young lion,



was just such a man, from his behaviour and experience, as might be expected to slay his nation's greatest foe with a smooth stone from the brook. That leads me to say that in the midst of our jubilation as dairymen over the magnificent triumphs which we have won in Chicago during the last summer, we should not forget the unostentatious and, perhaps, in a measure unknown good work of men like Mr. Taché, who made our victories for Quebec possible.

It is told of a traveller in Palestine that on one occasion he became quite incredulous concerning the identity of several wonderful relics which had been exhibited to him. He had been shown two skulls of John the Baptist, one of which was much larger than the other. His versatile guide endeavoured to allay his suspicions and satisfied his mind by the remark that there was nothing strange about that.—The one was the skull of the great Forerunner when he was a boy, and the other, after he was a grown man.

Not as a relic, but as the results of the faithful labours of our esteemed guest of the evening, I think it might hereafter be pointed out with pride that the Dairy Association of Quebec, in a large measure, was the fruit of the labours of such spirited men as M. Taché, Mr. H. S. Foster and others in their earlier efforts; and that the Dairy School at St. Hyacinthe and the triumphs of Quebec at Chicago were the fruits of the later efforts of these same men. He is truly the best public benefactor who has induced his fellow men to exert themselves for their own benefit, and who has stimulated men to activities which will have beneficial results upon themselves and their families. That is a much greater kindness than to merely bestow ever so many bounties in the form of gifts. In that sense the men who have promoted the development of dairying have been real benefactors to their country.

Dairy farming has saved the Province of Quebec and many other parts of Canada from financial depression, if not from utter loss of all profit in agriculture.

Providence stored this land full of good things. Blessed with fertile soil, an abundance of pure refreshing water, and a bracing healthy climate, its farmers have a splendid chance to develop its resources with comfort and gain to themselves. Dairying is putting hope into the hearts of the people concerning the outlook for themselves and their families, it is putting money in their pockets and it is protecting the soil against the prodigal dissipation of fertility which is sure to follow continuous grain growing and continuous hay and grain selling. It has far greater capability of helping the people to prosperous lives than has yet been recognized. Besides increasing the wealth of the farmers who follow it intelligently, it helps to maintain in the country a larger rural population, employed during the whole of the year in remunerative work. It promotes industrious habits and encourages the thrifty care of the little things on the farm which are apt to be neglected and to be let go to waste.

The greatest duty of the dairymer of the province at the present time, is the providing of cheap fodder for the months of winter. This fodder should be succulent, in order to keep the cows healthy and equal to giving a large flow of milk for the extension of winter dairying.

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*Mr. Chairman*

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Too many of the cows in the Province of Quebec are left with so much leisure from profitable occupation, that they are tempted to live on their owners without making them any adequate return for the feed which they consume. Too many holidays are not good for any class of workers, and I would recommend the practice as a most virtuous one for the cows in Quebec, to yield milk, or otherwise serve their owners for ten and a half months in every year.

As a knowledge of the best means of dairy farming becomes more general and more generally applied to the practice of the farmers, the Province of Quebec will be more thickly dotted over the whole of its beautiful, fertile surface with the happy homes of contented people who are unitedly and enthusiastically upholding the interests of our country, where every citizen has a chance to make the most of himself.

Again I thank you for the hearty reception which you have given to this toast, and for the opportunity which you have given me of making these few observations in appreciation of the very valuable work which our honoured guest, M. Taché, has done, not only for the people of this province, but for the people of the whole Dominion of Canada, in furthering the interests of this most important of all our industries.

#### REPLY OF MR. J. C. CHAPPAIS.

*Mr. Chairman and Gentlemen :*

My returning to this question, after the speech of Prof. Robertson, may seem to you perhaps to be superfluous. Still, as he spoke in English and I am speaking in French, I hope I shall be heard with some interest, since it may be that every one present did not understand the eloquent address that has just been pronounced.

I have no intention of repeating what fell from that eminent professor; his ideas and mine are alike; I am his assistant, and I must say, that I never met with a chief who has displayed more devotion to the interests of the province of Quebec than he has, and the proof of this is that, not long ago, he was specially attacked for having, as was said, favored Quebec at the expense of Ontario. The Ontario people complain of this, but as regards ourselves, it is a compliment. Called upon to reply to the toast of "The Dairy Industry," I think I cannot do better than to lay before you the phases through which this industry has passed, from its institution till to-day.

The Dairymen's Association, in this province, has had three very distinct periods. The first, that at which we were all present, is its infancy. It was born, as an association in very humble circumstances, in a very fine place, St. Hyacinthe.

Weakly, as are all newly born infants, it still was healthy; and it grew away without giving too much trouble to its parents, the most devoted of whom was our guest of the evening, M. Taché. (Cheers.)

Children that grow too fast, become, as you know, enervated as they grow. But our association evaded that danger; it followed the normal rule, grew gradually,

quietly and finished by making for itself in the province of Quebec a grand position, that all ministries have delighted to raise still higher, because our association is of all parties; it has received the support of all, and, I say it with pride, it has deserved it. (Cheers.)

After having so grown as to give the fairest prospects for the province of Quebec, like all ambitious children who wish to become conspicuous, it began to travel; it left its cradle; it wandered over all parts of the province; and later on, finding itself strong and capable, it left the province to go abroad. It visited Ottawa and there gave birth to the Dairy Association of the Dominion of Canada. I must say *en passant*, that we owe what was done for the dairy industry of the Dominion to an Irish-Canadian of our province, Mr. Lynch (1), who called into existence the grand convention that was held at Ottawa a few years ago, in consequence of which the dairy department of the Dominion was established. This constitutes the second period.

At this epoch, Professor Robertson was selected—and no one will say the choice fell upon the wrong man—as Director of that department, and the duty, a sufficiently arduous one, I confess, of being his assistant for the French part, was entrusted to me.

The third period of our association is that at which we arrived this year; it may be called the grandest of the three; for, it is this year, indeed, that Quebec gathered at Chicago the laurels you are all familiar with.

I know what I am talking about, Gentlemen, for I was at Chicago, whither I went to render all the services I could to the exhibition of our Canadian products.

There I saw all the butter and cheese that were exhibited, and I can assure you this evening, that we left Chicago proud of our success, and justly proud, too.

That success, which we owe to our intelligence, our industry, our labour, and to the powerful assistance which we received from all the influential men of the province of Quebec, *i. e.*, from people like M. Taché, Prof. Robertson, and many others well known to you, who have taken such trouble to win this success; the success, I say, which we met with at Chicago, must gratify us all; it is worth the trouble.

I met many dealers in butter and cheese from different States. They admitted that we excelled them, and they admitted it with a good grace that gave me pleasure, in the sense that they have rendered justice to the work we have done, especially to the labours of M. Taché, who was certainly, at any rate at the commencement of the association, its soul, and who has done the most for the interest of the province.

It was observed just now that the Association had advanced, not only owing to the assistance of governments, but because every one had aided it. The fact is, gentlemen, that if we look attentively into the composition of our society, we shall find in it instances of all the professions in the province. Is not our President the representative of the clergy? Our former Secretary, M. Taché, is he not a notary?

(1) *English-Canadian*, in the French copy, but Galway claims the Lynchs. A. R. J. F.

I, gentlemen, an advocate the other cause than I am sure I shall have been obliged to

You have I than this of mine who spoke so excellently of the minister of the agriculture. I

You know, association. On work. He has done him this justice, this is what I dare to say it, by what we read edited by one of us last July. My it is wonderful though, and we observations, and was the best system model to other countries there were nothing was given to me Ontario at the Fair ours was certainly in perfect manner, and

Well, gentlemen, right to be proud of his success; but I that our work has our labours, so a These results you on that account.

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I, gentlemen, am all the more proud of this fact that I am myself an advocate, and an advocate that congratulates himself of not having, for many years, pleaded any other cause than the cause of agriculture and dairying. From this point of view, I am sure I shall incur no blame this evening. For pleading this cause, I have never been obliged to please Tom by offending Jack.

You have listened, gentlemen, to very eloquent speeches, much more eloquent than this of mine. You have enjoyed the advantage of hearing one of our ministers, who spoke so encouragingly to you. You have also heard the representative of a minister of the Quebec government assure you of his entire devotion to the cause of agriculture. I was, on my part, heartily glad to hear these speeches.

You know, gentlemen, with what sentiments Monsieur Beaubien regards our association. On every occasion, he has shown us what interest he takes in our work. He has always been ready to give us that we asked him for; I am happy to do him this justice. Well, with the aid of such devoted men, with such powerful support, this is what we have won: we have won a reputation, not only Canadian, but, I dare to say it, not only American, but a European reputation. This fact is proved by what we read every day in papers foreign to our country; in a paper, for instance, edited by one of the most noted professors of agriculture, M. Lezé, who came to see us last July. M. Lezé, who is a great observer, only passed four days with us; and it is wonderful that he took in all that we told him; for we are all given to chatter enough, and we told him a multiplicity of things. Nevertheless, he made his own observations, and, on his return to France, he testified that our system of syndicates was the best system in the universe (*cheers*), that these syndicates might serve as a model to other countries (*cheers*). After such testimony, gentlemen, it seems as if there were nothing more to be said. Still, to this I will add a corroboration that was given to me at Chicago by Mr. Derbyshire, an Englishman, who represented Ontario at the Fair. He told me, that of all the systems he was acquainted with, ours was certainly the most perfect; that we organized the syndicates in the most perfect manner, and that our success was really due to that organization.

Well, gentlemen, with such testimonies in our favour, I say that we have a right to be proud of our work. I know that no one has a right to be too proud of his success; but I think that, in a meeting like this, we may be allowed to prove that our work has been fruitful, and to show forth the results we have obtained by our labours, so as to encourage ourselves to work still more earnestly in future. These results you are acquainted with: it is your right, then, to applaud yourselves on that account.

I may speak with a knowledge of what I am saying, as I am constantly called upon to inform myself of everything that happens in the country that is connected with dairying; and I am certain that, if we continue to work as we have hitherto worked, the province of Quebec will, before long, hold the first rank in the dairy-industry of the Dominion. This I fear not to affirm. (*Prolonged cheers*).

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 THE DAIRY-SCHOOL AND THE SYNDICATES.
 

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## TOAST PROPOSED BY MR. S. A. FISHER. (1)

Mr. Fisher rose to propose the Toast of the Dairy School and the Syndicates of the Province.

He begged permission to speak in English, as he wished first to give voice to the sentiment of the English dairymen of the province who were present at this demonstration to do honour to M. Taché. Unfortunately there were not as many English speaking members of the Provincial Association as there ought to be, but to these and even to a much larger number of the English speaking farmers, M. Taché's enterprise and devotion were well known, and much appreciated by them, and he only expressed the feeling of hundreds when he bore testimony to the good work to which M. Taché had with so great energy and skill devoted his time and his talents. The speaker then referred to the Dairy School which he had seen grow from its inception to the splendid position it now occupied. He congratulated the association on the efficient staff both at the school and in the syndicates, feeling that, from personal acquaintance, he was competent to speak of their excellent qualifications. He pointed out how important the Dairy School is, for nowadays the old methods of rule of thumb work would not do in agriculture. The successful farmer must be a well informed man, who had studied his business, and knew the why and the wherefore of everything connected with his work as well as the practical, manual part of the business. He pointed out how much better this is than the old state of affairs when any muscular drudge was good enough to be a farmer. Now there is abundant scope for the exercise of the best talent of our young people, and any ambitious young man can find in the business of farming not only a path to good position and esteem in the community, but also a large field for his best intelligence and culture. This ought to turn our bright young people's attention to farming as a business, and he hoped it would aid in stopping the unfortunate rush of people into the cities.

Mr. Fisher then spoke of the syndicates, saying that one of the proudest memories of his public work was that this system was founded on and carried out under the arrangements outlined in a memorandum drawn up by himself at the request of a committee of dairymen of the province, and that, after the lapse of a number of years, no change from the original programme had been found necessary. These syndicates had been a potent factor in the great improvement in the cheese of the province, and their extension, until they covered the whole area of the province, would be the best thing that could happen to the Dairy interests of Quebec. He begged to propose the toast in connection with the names of Messrs. Leclair and Livingston of the school, and Messrs. Macfarlane and Côté, the general inspectors.

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(1) The stenographer not having been able to give us the full text of Mr. Fisher's speech, we regret not to be in a position to furnish anything better than this feeble analysis of it. E.C.

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*Mr. Chairman a*

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## REPLY OF M. J. D. LECLAIR.

*Mr. Chairman and Gentlemen :*

It is with joy and happiness that, at the name of the Dairy School of St-Hyacinthe, I fulfil the duty of gratitude, in taking part in the chorus of congratulations. Our school derives directly from the Dairymen's Association, and is decidedly one of its greatest works.

After having seriously studied the dangerous position of the Province of Quebec, the dairy-products of which, scorned and sacrificed on the markets of Europe, were threatening sad consequences to a country almost entirely agricultural, our public men faced the situation with boldness. Founded and led by men of large and patriotic views, the Dairymen's Association combined every element needed to conduct to a prosperous conclusion the material revival of this province, and the government did not hesitate to entrust to it this important task.

It is to this work of progress that the foundation of the Dairy School of the province must be attributed. It no longer sufficed us to see how our neighbours did things and to follow in their footsteps; we wanted to learn the art of making butter and cheese; we wanted to trace out the road and to arrive at the first rank; and this, gentlemen, is the end the St. Hyacinthe Dairy School will enable us to succeed in gaining.

Pride yourself in your idea and its realisation, Monsieur Taché; glory in the satisfaction of having accomplished a work appreciated by the whole province. Hardly had the school opened its doors, when applications for admission showered from all parts, and more than 215 students, youths and men, flocked to it; some to perfect themselves in the art of manufacture; the rest to be initiated into the secrets of the art. Under this direction, our dairy industry has marched right in front and established our reputation in the eyes of the world, at the Chicago Fair.

Co-operating in a work so patriotic and liberal, the professors of the School will be urged on by such noble examples, and will strive to become worthy of the confidence of the public and of the Dairymen's Association. (Cheers.)

## REPLY OF MR. P. MACFARLANE.

*Mr. Chairman and Gentlemen :*

(Several voices : Français ! Français !)

As you have allowed Prof. Robertson, Mr. Fisher and others to reply in English, I trust you will accord me the same privilege, especially as Mr. Fisher has a better command of the French language than I have. Gentlemen, it affords me a great deal of pleasure to be present this evening to do honour to our friend, Mr. Taché—*my friend*. He has been in the front ranks of the Dairy Association from the beginning, stood by it during all these years of its infancy, and it must be a great

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source of satisfaction to him, in fact to us all, to see the fruit it is bearing to-day. We have a dairy school, an association of over 1,000 members—this is something to feel proud of. With regard to the syndicates, I may say our friend Taché, with one or two others, was the father and promoter of the syndicates. In 1891 we had 10 syndicates; 1892, 14; the past year, 28, and I predict for 1894 at least 40. The good work must continue until the name "French cheese" is obliterated. Let us teach the Englishman that the French-Canadian can make just as good, if not better, cheese than any one else, for he has richer milk to do it with. The results of the Province of Quebec at the World's Fair has established this fact. It may be you think I am going too far, but, you know, a Scotchman likes to "blow his horn." (Loud and long applause.)

#### REPLY OF M. SAUL COTÉ.

*Mr. Chairman and Gentlemen :*

I must confess that it is with great regret that I see my name figuring on the programme on this occasion. I came hither to profit by the superb instruction that the speakers who have just finished have given us. You ask me to speak in my turn; I hope you will get enough for your money! On the walls of this hall I see inscribed: "Gratitude to Monsieur Taché." These words express the thought that dominates the hearts of all present. This is worth more than anything I can say, and is, I trust, likely to prove to M. Taché how highly we appreciate his services, how truly thankful we all are to him!

It is vain to repeat it: M. Taché, since 1882, has done wonders for the Association, and if we look at the inscriptions hung round this hall, we shall be convinced that, as M. Gigault said, M. Taché has not been serving ingrates.

M. Taché has done much, because he has devoted himself entirely to, because he has spared no sacrifice and no labour for, the good of the dairy industry. It was therefore very right that those interested in dairying—which I will call the national industry—should recognize publicly the services rendered by him, which have so greatly contributed to the success we have obtained during the last few years, and especially this year at Chicago. I mention success. Yes, we may congratulate ourselves on our success, but that is not saying that we ought to stop there. On the contrary, we must redouble our efforts to gain still greater successes. We, inspectors-general and inspectors of syndicates, ought to join together to march in a body along the road of improvement. I repeat it: there remains a great deal to be done. For us, the first article of the programme is to accelerate the development of the production of milk, to improve its quality, to secure its better condition when delivered at the factory; for this purpose, we must get together the patrons, and do all in our power to encourage them to do their best as regards the threefold points of quantity, quality and the care taken of the milk. (Signs of approval.)

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*Mr. President a*

I did not expect you; but your "The progress of Societies." I am that we ought to the health of our prosperity of our history of the club to the narrative

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(1) The Rev. the chair.

You feel, Gentlemen, the importance of the syndicates; wherefore, I beseech you all, all who are interested in the cause of our society, to profit by the good inclination towards us of the Dominion Minister of Agriculture and the Commissioner of Agriculture of the province of Quebec; to profit, I say, by their good inclinations, to ask from them everything we need. To put into execution our entire programme, to gain the object we aim at, money is wanted, the sinews of war are wanted.

This is why I will say once more: let us unite to ask these ministers for all we want. Let us work together to obtain all that is necessary to enable us to advance more and more along the line of progress.

Perhaps I am rash in speaking thus of union; perhaps, at least, I shall appear rash to those who know that I am an old bachelor (laughter). What does it signify? I pray you once more, Gentlemen, to unite with us in our efforts to labour with still greater earnestness in the interests of the Dairy industry of the province of Quebec.

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### THE SISTER SOCIETIES.

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TOAST PROPOSED BY MR. ED. A. BARNARD.

*Mr. President and Gentlemen:*

I did not expect, at such a late hour of the evening, to be called upon to address you; but your kindness encourages me, and I will say a few words.

The programme of this evening's banquet contains the toast of "Our Sister Societies." I am very certain that we all love our sisters, but we must not forget that we ought still more to love and respect our mothers; and before proposing the health of our sister societies, we ought to have expressed our good wishes for the prosperity of our mother, the Dairymen's Association. M. Chapais related to us the history of the childhood of that society, so I will take the liberty of adding something to the narrative of M. Chapais.

The Dairymen's Association has only been at work since 1882, and she is already a mother, a mother of children that have already given proof of their work, and who are on the road, if they keep on, to equal, in the future, her own success. I will first speak of the Farmer's Syndicate, one of the children of our society.

At a meeting, which took place hardly eighteen months ago, the Dairymen's Association passed a resolution in favour of creating a syndicate of the farmers of the province of Quebec, a syndicate to assist our society in doing what it was unable to do alone, on account of the vast extent its programme already occupied.

Subsequently our association gave birth to a novel institution, the Farmer's Congress, another child of whom I must say a word.

Thus, Gentlemen, you will not be scandalised at seeing our Chairman (1) the

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(1) The Revd. Abbé Montminy, President of the Dairymen's Association, occupied the chair.

father of so many children. There are already two which promise to have large families if they go on as they have begun.

A few words, Gentlemen, on the Syndicate of the Farmers of Quebec. The first article of the programme of the syndicate is to contribute to agricultural instruction in a practical and efficient manner; by example, I intend no reproach to other like institutions in the country; I do not mean to insinuate that they are not working in a practical and efficient manner; but we have created a novel institution which, in many cases, will, we hope at least, do more efficient work than those that already exist. There are so many things that the Farmers' Syndicate, by its very organization, can undertake with greater advantage. It is very clear, for instance, that there is something wants doing in the interest of the farmers of this province to secure the better appreciation of the excellence of our cheese on the English market. The syndicate is studying that point with particular earnestness. Like the Dairymen's Association, it is composed of independent men who do not seek to benefit their own interests in securing the success of this organization. We must, *en passant*, do the Dairymen's Association the justice to say that none of its members has even had any other thing in view, in the success of our labours, than the general interests of the country, and not his own private benefit. Well, the syndicate is intended to do the same good work, being composed of men who have the same independence, the same devotion of character; it is, therefore, a child that already does credit to its mother.

The syndicate desires that the teaching of agriculture be conducted in a thoroughly practical manner, by means of ocular demonstration. I do not mean to enter into details now; but, as a member of the farmers' syndicate, I have the pleasure to inform you that we have an organisation that promises to open, before long, a school of practical and demonstrative agriculture, which shall rival in good work our excellent dairy school of St-Hyacinthe. It has also in view the improvement of Canadian cattle, and will spare no pains to secure that end. Once more, I cannot enter now into details; but I wanted to show you that this institution, the Quebec Syndicate, is growing up, and that this child of our association, though hardly eighteen months old, is already marriageable.

There is, again, another child of our association, a very unpretending one, for it is only a year old, but it is pretty tall already, and of good promise; the Farmers' Congress of the Province of Quebec. This was only organized last year (1892), and you know from those then present, that it did not make a bad figure on the day of its baptism; you will have heard that there were more than 400 delegates present at the opening of the congress. I think, and I have the right to say it, that if this child of our association is still young, it is not the less true that it is a child of great promise; I beg to draw the attention of the country to the very remarkable success of the first congress of the farmers of the province of Quebec.

Here, I must briefly do M. Gigault, the assistant commissioner of agriculture, the justice to say that, if there is a man who has worked to develop the farmers' clubs, as well as to insure the success of the farmers' congresses, that man is M. Gigault, who

interests himself in agriculture. He writes that it seems to me, that a complete transformation of creameries and dairies in the province of agriculture in the current shall be drawn, besides many times more easily and quite feasible.

is successful, as to cultivate especially are exposed to the sale. Dairying crops, and, in the

You will all this evening, the wealth, that the and for his family butter and cheese railways, we shall vince; and before able as the devotes parishes.

Such, gentle our Association. ing late. Since duty to mention and of which I culture.

The Council of greatest energy to do it that just our worthy vice merits our gratitude imposed upon him

I hasten, gentlemen, to its sister societies



interests himself so warmly in all measures that tend to the advancement of agriculture. He wishes me to say a word on colonisation by means of dairying. This, it seems to me, is a very important question. Dairying, I believe, is about to work a complete transformation in the future of colonisation, by introducing, in the train of creameries and cheeseries, and the hard cash that derives from them, the diffusion of agricultural knowledge among the settlers. With this system, as soon as the current shall be established, as soon as societies shall exist whence the settlers can draw, besides material resources, the information they need, colonisation will be ten times more easy and infinitely more fruitful. And what M. Gigault proposes is quite feasible. We must do all we can to second him in this enterprise which, if it is successful, as we cannot doubt it will be, will have the effect of getting the settlers to cultivate especially green fodder-crops, in place of grain-crops, which in the bush, are exposed to divers risks, and, even if they ripen, do not always find remunerative sale. Dairying promises, then, to the settler more hard cash returns, more certain crops, and, in the future, the maintenance of the fertility of the soil.

You will allow me, gentlemen, to repeat what I have already said several times this evening, that it is in dairying that farmers and settlers will find a sure source of wealth, that they will find that prosperity that each has a right to seek for himself and for his family. Let us then grow green fodder, improve our cattle, produce butter and cheese in abundance; and thanks to the policy of making colonisation railways, we shall see great colonisation-roads opened out through the whole province; and before long, colonisation, aided by dairying, will be at least as profitable as the development of that industry has been to our old farmers, our old parishes.

Such, gentlemen, is what I had to say about the societies that owe their life to our Association. As to the sister societies, I will only say one word, for it is growing late. Since the honour of proposing this toast has been assigned to me, it is my duty to mention specially a society of great importance to the province of Quebec, and of which I have the honour to be secretary: I mean the Council of Agriculture.

The Council of Agriculture, as it is constituted to-day, is labouring with the greatest energy for the development of agriculture in all its branches; I am happy to do it that justice. I am also happy to mention the name of men like Mr. Fisher, our worthy vice-president, a former member of the Council of Agriculture, who merits our gratitude for the enormous and most disinterested labour he has always imposed upon himself in furtherance of the interests of agriculture.

I hasten, gentlemen, to propose the health of the Dairymen's Association and of its sister societies.

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## THE PRESS.

TOAST PROPOSED BY M. J. B. BLANCHET.

*Mr. President and Gentlemen :*

I was more than a little surprised to see on the programme that a certain Blanchet was to offer the toast of The Press. When I saw that name on the list of toasts, I said to myself: can this be I? As I had no intimacy with the press, and as I heartily hate that great chatterbox, I added: it must be some other Blanchet.

Well, if I have really been told off to propose the health of the press, I think the organisers of this banquet ought to be arrested on a charge of obtaining speeches under false pretexes. I know not whether the Thompson criminal law has provided for this case or not, but it ought to have done so, seeing that it is a positive offence to force a man to make a speech *ex abrupto*. But, since I am that Blanchet, I must do my best; I shall only make a few remarks, though.

I remember to have read in my younger days, that on a certain market-day, a man named Xanthus, who passed in the eyes of his countrymen for a philosopher, ordered his slave Æsop (who, if he was not a philosopher, was very worthy of being one), to go and do his marketing, and to buy nothing but the very best things to be found. Æsop, who was not in a good humour that day, and doubtless wanted to play a trick on his master, went to the market and bought nothing but tongues, which he had cooked in a variety of ways.

In the days of Æsop, as in our days, everything new was charming. The guests of Xanthus were delighted with the flavour and variety of the dishes, at first; but at last, they began to get tired of them. Xanthus, who could not appreciate the joke, exclaimed to his slave: "Didn't I tell you not to buy anything but the best?" "Well," replied Æsop, "what is there better than the tongue? It is the bond of civic life, the organ of reason; with it towns are built and institutions managed; by its use we discharge the most important of our duties: to love woman and adore the gods."

"I am going to feast the same guests to-morrow," said Xanthus, "and I order you to buy the worst things for their dinner you can get." Next day Æsop sent up tongues again, saying that the tongue is the most hateful, the most atrocious thing in existence. "It is with the tongue," said he to his master, "that towns are destroyed, as well as the reputation, the honour and the glory of our neighbour. If it aids us to adore the gods and to love—women; too often, alas, it blasphemous and dishonours both."

In proposing the health of the press, I cannot, on this occasion, speak to you of that part of the press that, like Æsop's evil tongue, destroys the institutions and the reputations of men, when it is so easy to speak of the good part that daily combats

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*Mr. Chairman a*

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in favour of justice and liberty; of that press that is always struggling with the strong, the powerful and the proud, in defence of the weak and the unfortunate.

The Gospel relates a truly marvellous occurrence that you will allow me, in my favour, to quote.

A multitude of persons—about five thousand—having attended the preaching of our Lord for a whole day, grew hungry. He, having compassion on them, satisfied the whole with three loaves and three fish. Well, gentlemen, what the Master did on this occasion to satisfy the wants of the body, does not the press do every day for the much more exalted needs of the mind? It is not to five thousand persons that it distributes every day the bread of intellectual appetite, but to millions upon millions of individuals.

I told you just now that there could be no liberty without the press. I might add, without the press no flourishing dairying! I can affirm that, from the beginning of your Association's work, the press has never failed to give you good advice, to encourage you, to publish and advertise your success and your hopes. Quite lately, too, when the judges at the Chicago Fair proclaimed, in the face of the universe, that you were the most skilful of cheesemakers, who better than the press could carry this good and encouraging news to all the inhabitants of the earth? To that press, then, gentlemen, I invite you to empty your glasses. (Cheers.)

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#### REPLY BY M. DENIS.

*Mr. Chairman and Gentlemen:*

I am happy to be able, in the name of the press of St. Hyacinthe, to offer my congratulations to the guest of the evening, M. Taché, that man who rendered so many services to the cause of dairying during the time he was secretary of the Association.

I am glad to be able to prove that the papers of St. Hyacinthe, and all the other papers of the province in general, have done their best to aid the advancement and progress of this important industry.

There are present here representatives of the Montreal papers; to them I leave the task of replying to the toast. I doubt not they will so acquit themselves as to do honour to the papers they represent. (Cheers.)

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REPLY BY M. BOISSONNAULT.

*Mr. Chairman and Gentlemen:*

You take me quite by surprise. Being present at this celebration solely to make a report of it to the *Minerve*, the paper I am employed by, I did not at all expect to have the honour of replying to the toast of "The Press." I am far too feeble an interpreter to be equal to the discharge of such a task.

I can tell you, however, as a member of the press, that I am truly happy to salute the ardent and earnest patriot whom you fête this evening. The press, whose weak exponent I am, is happy to be able to unite with the people of St. Hyacinthe in rendering public thanks to M. Taché, who has done so much for farming and the farmer; who for twelve years has devoted all his energy and intelligence to the service of that industry of which our district has a right to be so proud; who has spared no pains to introduce into our rural parts new methods and most important improvements in our system of farming; who has so powerfully contributed to the creation and improvement of dairying in the Province of Quebec. This man, sirs, deserved this brilliant, this striking demonstration, where all classes of society have met together and are blended in the same thought, in a common sentiment of gratitude for services rendered.

And so, all classes of society are indebted to the man who vindicates the claims of agriculture, the first, the most sure, the most inexhaustible source of our prosperity.

The press, which has always lent its support to every noble cause, would fail in its mission were it to abstain here from showing how greatly it is interested in agriculture and in all its guardians. It is many a day since it first taught the people that in agriculture lay the strongest guarantee of national prosperity. It is many a day since the press began to repeat that agriculture would dam the current of emigration to the United States, and would cause a revival of confidence in our destinies and in our national welfare.

As a representative of that press, that takes so much interest in farming, in that most noble of professions, I drink with enthusiasm the toast that has just been proposed. (Cheers.)

THE LADIES.

The toast of "The Ladies," proposed by Mr. Bourgault, very late in the evening, was, as usual, received with enthusiasm. We regret to say that the reporter took no notes of M. Bourgault's speech.

Cream

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PAR

Arundel.....
Chatham.....
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Grenville.....
Harrington.....
Lachute.....
St. Andrew.....
St. Philippe.....
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Arthabaskaville.....
St. Albert.....
St. Clothilde de.....
St. Christophe ..
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LIST OF  
Creameries and Cheeseries of the Province of Quebec.<sup>(1)</sup>

ARGENTEUIL.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
Arundel .....	Wm. Graham .....			1
Chatham .....	Thos. Ross & Son .....			4
" .....	William J. Morrow .....			1
" .....	Leroux .....			1
Grenville .....	Thos. Ross & Son .....			1
Harrington .....	" .....			1
Lachute .....	" .....			3
St. Andrew .....	" .....			1
" .....	William J. Morrow .....	1		3
St. Philippe .....	Thos. Ross & Son .....			2
" .....	Pilon .....			1
" .....	Leroux .....			1

ARTHABASKA.

Arthabaskaville .....	Maheu & Frère .....			1
St. Albert .....	J. de L. Taché & J. P. Lefebvre .....			1
St. Clothilde de Horton .....	G. E. O. Benoit .....			1
St. Christophe .....	Phileas Bergeron .....			1
" .....	Jos. Michel .....			1
" .....	Thos. Baril .....			1
St. Hélène de Chester .....	P. Dumas .....			1
" .....	P. Girard .....			1
" .....	Léon Camire .....			1
" .....	Ferdinand Fortier .....			1
St. Louis de Blandford .....	Dolphis St. Laurent .....			1
St. Norbert .....	Alfred Ouelette .....			1
" .....	Brunel .....			1
" .....	St. Pierre & Bourbeau .....			1
" .....	David Dumont .....			1
St. Paul .....	Irénée Bergeron .....			1
" .....	Grégoire Lafontaine .....			1
" .....	Xavier Moreau .....			1
" .....	Joseph Leclair .....			1
" .....	L'Heureux & Fouquet .....			1
" .....	Napoleon Brunelle .....			1
" .....	H. Lehoullier .....			1
St. Patrick .....	Zéphirin Genest .....			1
" .....	Xavier Moreau .....			1
" .....	Joseph Morneau .....			1
" .....	P. D. Larivière .....			1
" .....	Phileas Laroche .....			1
St. Rémi de Tingwick .....	Taché & Lefebvre .....			1
" .....	Ernest Poisson .....			1
St. Samuel .....	Bergeron & Trudel .....			1

(1) We again offer this list to the public under all reserve; there are still many corrections to be made, and we request all those interested to help us to correct and complete it. Blank forms to be filled up will be sent to all who desire it. Counties marked with an asterisk are those whose list is the least certain of being correct. E. C.  
C. C. means combined creamery and cheesery.

## ARTHABASKA.—Continued.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
St. Valère de Bulstrode.....	Leclair & Frère .....			1
“ “ .....	Adolphe St. Laurent .....			1
“ “ .....	Blanchet & St. Laurent .....			1
Stanford .....	E. Brissette .....			1
“ “ .....	Léonard Perreault & Co. ....		1	
“ “ .....	Dame Widow J. Pellerin .....			1
“ “ .....	Cal. Dion .....			1
“ “ .....	Georges Blanchette .....			1
Victoriaville .....	D. O. Bourbeau .....			1
Warwick (St. Médard) .....	H. M. Méthot .....			1
“ “ .....	David Guilmette .....			1
“ “ .....	Nazaire Vidal .....			1
“ “ .....	Jules Lupien .....			1
“ “ .....	Dominique Babineau .....			1
Tingwick .....	Phileas Laroche .....			1
Chester (North) .....	Joseph Prince .....			1

## BAGOT.

St. André d'Acton .....	Milton McDonald .....			1
“ “ .....	Cédras Asselin .....			1
Ste. Christine .....	Milton McDonald .....			1
“ “ .....	Jos. Dufault .....			1
St. Dominique .....	L. Sarrazin .....			1
“ “ .....	Phileas Ménard .....			1
“ “ .....	Antoine Chagnon .....			1
“ “ .....	J. Bte. Lapalme .....			1
“ “ .....	Norb. Fredette .....			1
St. Ephrem d'Upton .....	S. Lafontaine & Frère .....			1
“ “ .....	L. Lussier .....			1
“ “ .....	Lapalme .....			1
Ste. Hélène .....	Eusébe Dufault .....			1
“ “ .....	Antoine Sicard .....			1
St. Hugues .....	Brodeur, Fafard & Brousseau .....			1
“ “ .....	A. Lanoie .....			1
“ “ .....	Octave L'Heureux .....			1
St. Liboire .....	Jos. Lemonde .....			1
“ “ .....	François Lajoie .....			1
St. Nazaire .....	Milton McDonald .....			1
St. Pie .....	J. Bte. Racine .....			1
“ “ .....	J. Blanchard .....			1
“ “ .....	J. Vadnais .....			1
“ “ .....	A. Morin .....			1
“ “ .....	H. Lapalme .....			1
St. Rosalie .....	Jos. B. Grenier .....			1
“ “ .....	Frs. Lemonde .....			1
St. Simon .....	Hermenégilde Robert .....			1
“ “ .....	Edouard Laliberté .....			1
“ “ .....	Joseph Lemonde .....			1
St. Theodore .....	Chaput & Bousquet .....			1
“ “ .....	Isidore Jodoin .....			1

PAR

Saints Anges .....	
“ “ .....	
St. Côme de Ken .....	
St. Elzéar .....	
“ “ .....	
St. Ephrem .....	
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St. Evariste de F .....	
St. François .....	
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St. Honoré .....	
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St. Joseph .....	
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St. Marie .....	
“ “ .....	
“ “ .....	
“ “ .....	
St. Maxime (Scott) .....	
Ste. Pierre de Brou .....	
“ “ .....	
St. Samuel .....	
St. Sébastien .....	
St. Victor de Tring .....	
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“ “ .....	
St. Vital de Lambto .....	
“ “ .....	
St. Méthode d'Astoc .....	



## BEAUCE.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
Saints Anges	Plante & Giguère			1
"	N. Beaudoin			1
St. Côte de Kennebec	Irénée Bélanger			1
St. Elzéar	Drouin & Plante			1
"	A. Bilodeau (for sale)			1
St. Ephrem	Macpherson & Taché		2	
"	Olivier Poulin			2
"	Nap. Beaudoin			1
"	L. Pomerleau			1
St. Evariste de Forsyth	Lachance & Blais			1
St. François	Bolduc & Co.			1
"	Fortin & Co.			1
"	Chas. Bolduc and others			1
"	Veilleux & Co.			1
"	J. Bureau & Co.			1
"	Frs. Gagnon & Co.			1
"	N. Beaudoin			1
"	Ed. Loubier & Co.			1
"	T. Poulin & Co.		1	
St. Frederic	F. X. Plante			1
"	Hilaire Gilbert			1
"	Georges Lagueux			1
St. Georges	Albert Poulin			1
"	L. Gendreau			1
"	Ch. Poulin			1
"	John Gosling			1
"	Morin & Co.			1
"	Cheeserie No. 5, range St. Pierre.			1
St. Honoré	Cheese Factory Co. (Asso. No. 1)			1
"	N. Beaudoin		1	
"	Louis Fortier			1
"	M. Lavigne			1
St. Joseph	Joseph Lambert (St. Joseph)			2
"	Vital Roy			1
"	M. Doyon			1
"	Thomas Doyon, son of Jean.			1
"	Vital Cliche			1
St. Marie	McPherson & Taché		1	
"	Jean Faucher			1
"	H. Havard			1
"	Marcoux & Co.			1
"	Jolicœur & Marcoux			1
St. Maxime (Scott Station)	Macpherson & Taché		1	
St. Pierre de Broughton	Alfred Gagné			1
"	J. Gagnon			1
St. Samuel	Association No. 1			1
St. Sébastien	Nap. Beaudoin			1
St. Victor de Tring	McPherson & Taché		1	
"	Nap. Beaudoin			2
"	Plante & Grondin			1
"	Elie Roy (1st range)			1
"	J. Bernard (3rd range)			1
"	Marcelin Rodrigue			1
St. Vital de Lambton	G. B. Lavigne			2
"	J. E. Roberge		1	
St. Méthode d'Astock	Cheeserie No. 1 of Astock			1

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BEAUHARNOIS.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
Beauharnois	J. H. Roy			1
St. Clément	St. Clément Cheese Co			1
St. Etienne	Jérémié Brosseau			1
"	Sauvé et Laberge			1
St. Louis de Gonzague	John Thompson			1
"	Chas. Tait			1
"	Thos. Gardner			1
"	Antoine Sauvé			1
"	McPherson & Ferguson			1
"	Horm. Lepage	1		
St. Stanislas de Kostka	Aug. Lespérance			2
"	William Durnin			1
St. Timothée	Auguste Crevier			1
Ste. Cécile de Valleyfield	James Irwine			1

BELLECHASSE.

Beaumont	Théod. Beaudoin			1
Buckland	Métivier & Fortier	1		
St. Cajétan d'Armagh	Rvd. M. Dionne & Co			1
St. Charles	Mercier, Blais & Couture	1		
St. Lazare	G. Chabot			1
"	J. Bilodeau	1		
St. Magloire	Ars. Roy			1
St. Gervais	P. Fortier	1		
"	Dr. Tanguay	1		
St. Michel	Jos. Ringuet	1		
"	Ars. Roy	1		
St. Nérée	Breton	1		
St. Philémon	Coté	1		
St. Raphaël	Phil. Gonthier	1		

BERTHIER.

Berthier Parish	A. Dulmaine			2
"	Athie Mousseau			1
"	Louis Olivier			1
Isle du Pas	Alfred Plante			1
"	J. Bte. Côté			1
Lavaltrie	R. Curé			1
St. Barthelemi	F. E. Rouleau			1
"	F. X. Mayer			1
"	O. Brunette			1
"	Urgel Lécuyer			1
St. Cuthbert	Ulric Courchesne			1
"	Joachim Grégoire			1
"	Antoine Robert			1
"	J. Marchand			1
"	H. Brunette			1
"	J. Lacourse			1
St. Damien	Joseph Boucher			1

PARIS

St. Damien	
"	
St. Gabriel de Br	
"	
"	
Lanoraie	
"	
St. Michel des Sai	
St. Norbert	
St. Zénon	

New Richmond...  
Port Daniel

Bolton East

Bolton West  
Brome

Farnham

Potton

Sutton

BERTHIER.—Continued.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
St. Damien .....	Widow Euelide Boucher .....			1
“ .....	E. Boucher .....			1
St. Gabriel de Brandon .....	George Dubeau .....			3
“ .....	H. Dauphinais .....			1
“ .....	Edward Remington .....			1
“ .....	J. Beaudoin .....			1
Lanoraie .....	Ulric Courchesne .....			1
“ .....	A. Farlaud .....			1
St. Michel des Saints .....	Alexis Ménard .....			1
St. Norbert .....	St. Denis .....			2
St. Zénon .....	E. St. Pierre .....			1

BONAVENTURE.

New Richmond .....	J. E. Arseneau (Association) .....			1
Port Daniel .....	(Association) Rev. Aug. Gagnon .....			1

BROME.

Bolton East .....	W. A. Randall .....			2
“ .....	J. Whitehead .....			1
“ .....	J. F. Bryant .....			1
“ .....	Louis Lacaillade .....			1
Bolton West .....	Rufus Blunt .....			2
Brome .....	G. E. Gingras .....			1
“ .....	Robt. Morisson .....			1
“ .....	Geo. A. Robb .....			1
“ .....	W. J. Sheldon .....			1
“ .....	Crittenden .....			1
“ .....	Will. Todd .....			1
“ .....	Geo. A. Millar .....			1
“ .....	D. F. Sweet .....			1
“ .....	J. W. Benjamin .....			1
“ .....	Mason Woodard .....			1
“ .....	C. R. Todd .....			1
“ .....	Eusebe Patenaude .....			1
“ .....	John Vernal .....			1
Farnham .....	Philius Domingue .....			1
“ .....	E. J. Enright .....			1
“ .....	M. A. Hawk .....			1
“ .....	C. D. Jewell .....			1
“ .....	T. W. Wilkinson .....			1
“ .....	C. D. Jewell .....			1
Potton .....	Dudley & Co. .....			1
“ .....	J. W. Blanchard .....			1
“ .....	O. W. Bailey .....			2
“ .....	J. N. Labelle .....			1
Sutton .....	C. W. Esty Asa .....			1
“ .....	C. M. Willey .....			1
“ .....	A. T. Newton .....			2
“ .....	E. Charbonneau .....			1
“ .....	J. B. Strong .....			1
“ .....	W. McFarlane .....			1
“ .....	H. O. Wales .....			1
“ .....	Norman Sweet .....			1



## CHAMBLY.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
St. Basile le Grand .....	Avila Trudeau .....			1
St. Hubert .....	Alfred Baillargeon .....			1
St. Joseph de Chambly .....	Georges Pepin .....			1

## CHAMPLAIN.

Champlain .....	Joseph C. Felix .....			1
N. D. du Mont Carmel .....	Luc Ducharme .....			2
" " .....	Jos. Cossette .....			1
Ste. Anne de la Pérade .....	N. E. Clément .....	1		1
" " .....	G. Latour .....	1		1
" " .....	J. A. Foley .....			1
" " .....	Michel Loranger .....			1
" " .....	Oliva Montreuil .....			1
" " .....	Alfred Gendron .....			1
St. Flore .....	Edouard Laperrière & Mateau .....			1
" " .....	Ulderic Leblanc .....			1
" " .....	Hilaire Lupien .....			1
St. François-Xavier de Batiscan .....	Isidore Laquière .....			1
" " .....	L. P. Lacoursière .....			1
" " .....	Pierre Lapointe .....			1
" " .....	Ludger Duval .....			1
" " .....	Chs. Gouin .....			1
Ste. Geneviève de Batiscan .....	Philippe Trudel .....			1
" " .....	Onésime Marchand .....			1
" " .....	E. Massicotte & Norbert .....			1
" " .....	Ernest Jacob .....			1
" " .....	F. X. Massicotte .....			1
" " .....	Geo. Dessureau .....			1
" " .....	Fournier .....			1
" " .....	Walter Norbert .....			1
St. Luc .....	Anselme Beaudoin .....	1		1
" " .....	Louis Beaudoin .....			1
" " .....	Hubert Norbert .....	1		1
St. Maurice .....	F. X. Blondin .....			1
" " .....	Antoine Laprise .....	1		1
" " .....	Adelard Grégoire .....	1		1
" " .....	Hubert Norbert .....			1
St. Narcisse .....	Trefflé Trudel .....			1
" " .....	Ferdinand Cossette .....			1
" " .....	Benjamin Boulanger .....			1
" " .....	Joseph Drouin .....			1
St. Prosper .....	Alfred Trudel .....			1
" " .....	Guillaume Lacoursière .....			1
" " .....	Cloutier & Lacoursière .....			1
" " .....	Théophile Cloutier .....			1
St. Stanislas .....	Alfred Trudel & Co. ....			1
" " .....	Joseph L. Jacob .....			1
" " .....	J. Jacob .....			1
St. Thècle .....	Alfred Trudel & Co. ....			1
St. Tite .....	Alfred Trudel & Co. ....			1
" " .....	Jacob & Paquin .....			1

## PARI

St. Tite .....	
" " .....	
" " .....	
St. Séverin .....	
" " .....	
St. Adolphe .....	
" " .....	
Baie St. Paul .....	
" " .....	
" " .....	
Les Eboulements	
Malbaie .....	
St. Urbain .....	
St. Fidèle .....	
St. Placide .....	
St. Irénée .....	
Chateauguay .....	
St. Jean Chrysost	
" " .....	
" " .....	
Ste. Martine .....	
St. Malachie de C	
" " .....	
" " .....	
" " .....	
Ormstown (village)	
St. Philomène .....	
" " .....	
Très. St. Sacremer	
" " .....	
" " .....	
St. Urbain .....	
St. Alexis .....	
" " .....	
St. Alphonse .....	



## CHICOUTIMI—Continued.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
St. Alphonse	Joseph Buteau			1
"	Wilfred Côté			1
"	Elie Tremblay			1
St. Anne	André Bouchard			1
"	Henri Côté			1
"	Eugène Guay			1
"	Xavier Savard			1
"	N. Gravel			1
"	Louis Boucher			1
Chicoutimi	Frs. Maltais			1
"	Rich. Gagnon			1
"	David Maltais			1
"	Henri Fortin			1
"	Ernest Jean			1
"	Frs. Brassard			1
"	W. Grant			2
"	Jean Perron		1	1
St. Cyriac	M. Vaillancourt			1
St. Dominique	Joseph Brassard			1
"	Donat Brassard		1	.....
"	Pascal Bergeron			1
"	Jean Girard			1
"	Xavier Gagnon			1
St. Fulgence	Jos. Harvey			1
N. D. de la Terrière	Thom. Tremblay			1
"	E. Girard			1
"	Ls. Aubin		1	.....
"	B. Gaudreault			1
St. Jean (Anse)	Zéphirin Desgagné			1

## COMPTON.

Birchton	John Mackie (for sale)			1
Bury	John Mackie			1
Coaticook	A. Gérin			2
Clifton East	E. S. Lussier			1
Emberton	Rvd. Tremblay			1
N. D. des Bois	A. R. Dumoulin			1
Ste. Edwidge	A. Gérin			1
St. Pierre de Ditton	Alex. Bourret			1
St. Romain	Cyrille Bourque			.....
St. Venant	Frank L. Young			1
"	L. Paquette		1	1
Auckland	Jos. Roy			1
Moes River	A. Gérin			1

## DEUX-MONTAGNES.

St. Augustin	Osius Duquette		1	.....
"	Frs. X. Charbonneau			1
St. Benoit	N. Fauteux			.....
St. Canut	M. Grace			1

PARISHES.
St. Eustache (pa
"
" (vi
St. Hermas
St. Joseph du La
St. Monique
St. Placide
Ste. Scholastiqu
"
"
Oka
"
Frampton
St. Anselme
"
St. Bernard
St. Claire
Ste. Hénédine
"
St. Isidore
St. Justine
St. Léon de Stand
"
St. Malachie
St. Marguerite
"
St. Odilon
"
Kingsey, French v
"
"
L'Avenir (St. Pier
"
"
"
St. Eugène
St. Fulgence de Du
"
St. Christine



## DEUX-MONTAGNES.—Continued.

series	Cheeseries.	PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
	1	St. Eustache (parish)	Oscar Paquette		1	
	1	"	F. X. Laurin		1	
	1	"	L. W. J. Payment		2	
	1	" (village)	J. E. Binette		1	
	1	St. Hermas	Benjamin Beauchamp			1
	1	"	J. W. Morrow			1
	1	St. Joseph du Lac	McCall & Ladouceur			1
	1	Ste. Monique	Albert Gaudet			1
	1	St. Placide	Anthime Pilon			1
	1	"	Alph. Dubreuil		1	
	1	Ste. Scholastique	Louis Lacroix			1
	1	"	John Morin			1
	1	" (village)	J. Dumoulin			1
	2	"	Ovide Hamelin			1
	1	Oka	Ignace Sabourin			1
1	1	"	RR. FP. Trappistes		1	
	1	"	W. Lalonde		1	

## DORCHESTER.

	1	Frampton	J. Bte. Blais			1
	1	St. Anselme	Macpherson & Taché		1	
	1	"	Amedée Grégoire			1
1	1	St. Bernard	Macpherson & Taché		1	
	1	Ste. Claire	Georges Richard			1
	1	"	Alphonse Bernier		1	
	1	Ste. Hénédine	Association, G. Dumont			1
	1	"	D. Cloutier			1
	1	St. Isidore	Macpherson & Taché		2	
	1	Ste. Justine	Léo Cayouette			1
	1	St. Léon de Standon	Victor Blanchet			1
	1	"	L. N. Beaudoin			1
	1	St. Malachie	Napoléon Beaudoin			1
	1	Ste. Marguerite	David Cloutier			1
	1	"	L. N. Beaudoin			1
	1	"	Société de Cultivateurs			1
	1	St. Odilon	Veilleux & Co.			1

## DRUMMOND.

	1	Kingsey, French village	Société de St. Felix			1
	1	"	George Benoit			1
	1	"	Jos. Lefebvre			1
	1	"	Association, J. Lefebvre, manager			1
	1	L'Avenir (St. Pierre de Durham)	Hylas Duguay			1
	1	"	Ephrem Charpentier			1
	1	"	C. Duguay & Co.			1
	1	"	H. Duguay & Co.			1
	1	"	Jos. Dionne			1
	1	"	H. Duguay & Co.			1
	1	St. Eugène	Gédéon Nicolas			1
	1	St. Fulgence de Durham	D. N. McLeod			1
	1	"	Ulfery Mongeon			1
	1	Ste. Christine	Charles Asselin			1

## DRUMMOND.—Continued.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
St. Germain de Grantham .....	Olivier Lemaire .....			1
“ “ .....	Lépine .....			1
“ “ .....	A. Lanois .....			1
“ “ .....	L. Girard .....			1
“ “ .....	Louis Fontaine .....			1
St. Guillaume d'Upton .....	Alfred Archambault .....			1
Wendover, Simpson .....	Napoleon Raymond .....			1
“ “ .....	Charles Cyr .....			1
“ St. Cyrille .....	Paul Valois .....			1
“ “ .....	C. G. Caron .....			1
Wickham West .....	Jos. Lafrance .....			1

## GASPÉ.\*

No Factories.

## HOCHELAGA.\*

Rivière des Prairies .....	Numa Vezina .....			1
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## HUNTINGDON.

Dundee .....	D. M. Macpherson .....			2
“ .....	Macpherson & Ferguson .....			2
Elgin .....	“ .....			2
“ .....	D. M. Macpherson .....			1
“ .....	Thos. Wood .....			1
Franklin .....	R. H. Boomhower .....	1		
Godmanchester .....	D. M. Macpherson .....			4
“ .....	Macpherson & Ferguson .....			2
“ .....	W. Patton .....			1
“ .....	John Elder .....			1
“ .....	W. H. Walker .....			1
Havelock .....	W. Saunders .....	1		
Hemmingford .....	Thos. Boyce .....	2		
Hinchinbroke .....	D. M. Macpherson .....			2
“ .....	Macpherson & Ferguson .....			1
“ .....	Farquhar & Oliver .....			1
“ .....	John Cairns .....			1
“ .....	Samuel Henderson .....			1
“ .....	Daniel Staring .....			1
“ .....	Robert Kelly .....			1
“ .....	John Purse .....			1
“ .....	John Boyd .....			1
“ .....	Rob. Boyd .....	1		
Kelso .....	Smaill Bros .....	1		

## PARIS

St. Anicet .....
“ .....
“ .....
“ .....
“ .....
Ste. Barbe .....

Sabrevois .....
St. Alexandre .....
“ .....
St. Athanase .....
St. Brigide .....
St. George de He .....
“ .....
St. Grégoire le Gr .....
“ .....
St. Sebastien .....
Ste. Sabine .....
“ .....

St. Geneviève .....
“ .....
Pointe Claire .....
Ste. Anne .....
Ile Bizard .....
St. Laurent .....

St. Alphonse .....
“ .....
St. Ambroise .....
“ .....
“ .....
St. Béatrice .....
“ .....
“ .....
St. Come .....
Ste. Elizabeth .....
“ .....





## JOLIETTE—Continued.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
Ste. Elizabeth.....	George Gingras .....			1
" .....	G. Roy .....			1
Ste. Emmélie.....	Jérémie Boucher.....			1
" .....	Onésime Beaudry.....			1
" .....	Moïse Beaulieu.....			1
" .....	Joseph Desroches.....			1
" .....	Joseph Coutu .....			1
" .....	Charles Blais.....			1
St. Jean de Matha.....	Louis Robitaille.....			1
" .....	Louis Marcl .....			1
" .....	Joseph Brault.....			1
" .....	Adolphe Ratel .....			1
" .....	Anselme Asselin.....			1
" .....	Léon Bonin .....			1
" .....	Moïse Roy.....			1
" .....	George Clermont.....			1
St. Felix de Valois.....	Adolphe Beaudry.....			1
" .....	John Louis Coutu.....			1
" .....	Joseph Gravelle.....			1
" .....	Eugène Boucher.....			1
" .....	George Asselin.....			1
" .....	J. B. Boucher.....			1
Ste. Mélanie.....	Jos. Clément.....			1
" .....	Israël Lepage.....			1
St. Paul.....	M. Gingras.....			2
" .....	N. Brière.....			1

## KAMOURASKA.

Kamouraska.....	Cheese Co.....			1
St. Alexandre.....	Edouard Pelletier.....			1
St. André.....	A. R. Desjardins & C. Marquis.....			1
Ste. Anne de la Pocatière.....	François Gendron.....			1
" .....	Joseph Boucher.....			1
St. Denis.....	Augustin Dionne.....			1
St. Germain de Kamouraska.....	Bernier.....			1
St. Hélène.....	Anselme Ouellette & F. Gendron.....			1
St. Pacôme.....	J. Lévesque.....			1
St. Paschal.....	Macpherson & Taché.....		1	1
St. Philippe de Néri.....	Louis Anctil & Co.....			1
Rivière Ouelle.....	J. A. Pelletier.....	1		1

## LAC ST. JEAN.

Chambord.....	Octave Lefrançois.....			1
Hebertville.....	P. E. Hudon.....			1
" .....	Servule Tremblay.....			1
" .....	Pierre Martel.....			1
" .....	Ives Tremblay.....			1
Normandin.....	J. E. Trotier.....			1
Roberval.....	S. C. Paquet.....			1
St. Bruno.....	Ernest Desbiens.....			1
St. Félicien.....	David Girard.....			1
St. Gédéon.....	Jos. Girard.....			1

P

St. Jérôme .....

" .....

" .....

" .....

St. Joseph d'A.....

" Prime.....

St. Prime.....

St. Cœur de M.....

L'Assomptien (.....

" .....

Lachenaie.....

Laurentides.....

St. Lin.....

L'Epiphanie.....

" .....

" .....

St. Henri de M.....

" .....

" .....

St. Paul l'Herm.....

St. Roch.....

" .....

" .....

St. Sulpice.....

Repentigny.....

St. Frs. de Sales.....

" .....

" .....

St. Martin.....

Ste. Rose.....

" (Villag.....

St. Vincent de.....

" .....

" .....

St. Henri.....

" .....

St. Lambert.....

St. Nicholas.....

" .....



## L'ISLET.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
Anse-à-Giles.....	Eustache Ménard.....		1	.....
L'Islet (Suburbs).....	L. A. Boucher.....			1
"    (Station).....	O. Carbonneau.....			1
Trois Saumons.....	Cyrias Houle.....		1	.....
St. Aubert.....	Alfred Blais.....		1	.....
"    ".....	F. Boissonneau.....		1	.....
St. Cyrille.....	Guimond & Boucher.....			1
"    ".....	L. S. Boucher.....			1
St. Eugène.....	Joseph Thibault.....		1	.....
St. Jean Port Jolly.....	Ed. Vaillancourt.....			1
St. Louise.....	Nazaire Caron.....			1
St. Pamphile.....	Rvd. Blanchet & Co.....		1	.....
St. Roch des Auinales.....	Pelletier Origène.....			1
Village ".....	Aug. Pelletier & Co.....	1	.....	.....

## LOTBINIÈRE.

St. Agapit.....	Félix Lambert.....			1
"    ".....	Arthur Tremblay.....		1	.....
St. Agathe.....	Octave Boulanger.....		1	.....
St. Antoine de Tilly.....	Alphonse Bergeron.....			1
"    ".....	Alphée Aubin.....			1
"    ".....	Félix Lambert.....			1
St. Apollinaire.....	Alph. Bergeron & Co.....			1
"    ".....	J. Bte. Côté.....			1
St. Croix.....	Rinfret, Boisvert & Garneau.....			1
"    ".....	"    "    ".....			1
"    ".....	"    "    ".....			1
"    ".....	"    "    ".....			1
St. Edouard.....	Eugène Béaume.....			1
"    ".....	Ferd. Coulombe.....			1
"    ".....	Elisée Hamel.....			1
"    ".....	Cie de Villers.....	1	.....	.....
St. Emélie.....	Widow Gagné.....			1
St. Flavien.....	Lazare Bédard.....			1
St. Jean des Chaillons.....	A. A. Mailhot.....		1	.....
"    ".....	Arthur Paris.....			1
"    ".....	Dubuc & Bro.....			1
"    ".....	Genest.....		1	.....
St. Louis de Lotbinière.....	Henri Bernier.....		1	.....
"    ".....	Laurent Hamel.....			1
"    ".....	Wilfrid Vézina.....		1	.....
St. Narcisse.....	Alphonse Desrochers.....			1
St. Philomène.....	Philippe Bourret.....			1
St. Sylvestre.....	Paquette.....		1	.....

## MASKINONGÉ.

Maskinongé.....	N. E. Clément.....	1	.....	.....
"    ".....	Antoine Saucier.....		1	.....
"    ".....	P. Sicard.....			1
St. Alexis.....	P. L. Bellerose.....			1
"    ".....	Pierre Boucher.....			1

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
St. Didace.....				
"    ".....				
"    ".....				
"    ".....				
St. Justin.....				
St. Leon.....				
"    ".....				
"    ".....				
St-Paulin.....				
St. Ursule.....				
"    ".....				
"    ".....				
"    ".....				
Mastigoche.....				
Louiseville.....				
"    ".....				
Matane.....				
"    Little.....				
St. Flavie.....				
St-Octave de M.....				
Inverness West.....				
Leeds.....				
Lyster.....				
N.-D. de Lourdes.....				
Sacre Cœur de M.....				
"    ".....				
Somerset.....				
"    ".....				
"    ".....				
Thetford.....				
"    ".....				
St-Adrien.....				
"    ".....				
St-Ferdinand.....				
"    ".....				
"    ".....				
"    ".....				



## MASKINONGE.—Continued.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
St. Didace	E. Lanoix			1
"	H. Boucher			1
"	Joseph Jolette			1
"	N. Perrault			1
"	Alfred Morin			1
"	Henri Bergeron			1
St. Justin	Pierre Baril		1	
"	Pierre Bussiere			1
"	A. Ladouceur			1
St. Leon	Leonard Milot			1
"	Paul Boisvert			1
"	Samuel Lefrançois			1
"	Caron, Boisvert & Roy			1
"	Frs. Dionne			1
St-Paulin	Henri Bergeron			1
St. Ursule	Georges Boland			1
"	Dolphis Lessard			1
"	Sam. Boucher			1
"	Dolphis Belanger			1
"	D. Turner			1
Mastigoche	Georges Lefrançois			1
Louiseville	A. Milot		1	
"	C. Paquin			1
"	Caron & Roy			1

## MATANE.

Matane	Harrison & Truchon		1	
" Little	Paten & Thibault		1	
Ste. Flavie	Honore Paquet			1
"	F.-X. Pelletier			1
St-Octave de Metis	Phil. Mercier		1	

## MEGANTIC.

Inverness West	Thibault & Marion			1
Leeds	M. Wilson			1
Lyster	Coté & Co.			1
N.-D. de Lourdes	Gasien Roy			1
Sacre Cœur de Marie	Raymond Beaudoin			1
"	J. O. Hebert		1	
Somerset	J. Deguise & Co.	1		
"	Creameries		1	
"	Napoleon Proulx		1	
"	David Simoneau			1
Thetford	J. Gagne			1
"	Cloutier & Co.			1
St-Adrien	Caron & Roy			1
"	Gilbert & Masse			1
St-Ferdinand	B. Pelletier			1
"	Louis Gilbert			1
"	"			1
"	Thibeault & Boucher			1
"	X. Masse & Co			1
"	Louis Gilbert			1

## MEGANTIC.—Continued.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
St. Ferdinand	Oscar Gilbert			1
"	Beaudoin & Provencher			1
"	Lavertu & Co.			1
Ste. Julie	Mercier & Comtois			1
"	Jutras & Co.			1
St. Pierre Baptiste	Thibault & Marcoux			1
Ste. Sophie	U. Pellerin			1
"	Beliveau & Skilling			1
"	Honore Fortier			1
"	C. Boucher			1
"	Jos. Gaudreau			1

## MISSISQUOL.

Abbott's Corner	H. M. Shears			1
Beranger	N. Girard			1
Cowansville, P. Que.	C. D. Jewell			1
"	W. A. Martindale			1
"	A. C. Carter			1
Dunham	J. L. & H. S. Gilbert			1
East Dunham	J. S. Wales			1
"	W. A. Perkins			1
Farnham	W. H. Tilson			1
Farnham Center	T. L. Burnett			1
Farnham	E. G. Welch			1
Frelighsburg	T. Morisson			1
Haseville	R. J. Tilson			1
Moor's Station	T. S. Taylor			1
Mystic	E. H. Spoor			1
North Stanbridge	Jered Hawk No. 2			1
"	E. A. Russell			1
Stanbridge East	Jered Hawk No. 1			1
"	E. A. Russell			1
Pigeon Hill	S. Duhamel			1
Ste. Sabine	E. Bouchard			1
Sweetsburg	S. J. Ingalls No. 1			1
"	No. 2			1
Venice	C. M. Harvey			1

## MONTCALM.

Rawdon	J. Lane			1
"	J. Bordeleau			1
St. Alexis	Ernest Liard	1		
"	O. Magnan	1		
St. Calixte	B. Rivet			1
St. Esprit	R. Lesage	1		
St. Jacques	A. Boucher			1
"	Nap. Marion			1
Ste. Julienne	Beausejour			1
St. Liguori	Jos. Gaudette	1		
Ste. Marie Salome	J. E. Gaudette	1		
St. Theodore	Beauregard			1

PAR

Berthier

Cap St. Ignace

Isle aux Grues

Montmagny (tov

St. François Riv

St. Pierre Riv. d

St. Paul de But

Ange Gardien

Château Richer

Isle aux Reaux

Ste. Anne de Bea

Ste. Famille

St. Joachim

St. Feréol

St. François, Isle

St. Jean, I. O.

St. Pierre, I. O.

St. Tite des Caps

St. Cyprien

St. Michel Archai

St. Rémi

Bécancourt

Gentilly Rivière

Nicolet parish

St. Angèle de Lava

St. Brigitte des Sa

St. Célestin, village

Côte S

## MONTMAGNY.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
Berthier .....	Numa Bernatchez .....		1	
Cap St. Ignace .....	Joseph Eloi Jalbert .....		1	
" .....	Edouard Pelletier .....			1
Isle aux Grues .....	Chas. Georges Roy .....			1
" .....	" .....			1
Montmagny (town) No. 1 .....	N. Bernatchez .....		1	
" No. 2 .....	Association .....		1	
St. François Riv. du Sud .....	F. X. Dagneau .....		1	
St. Pierre Riv. du Sud .....	Jacques Collin .....		1	
St. Paul de Buton .....	Z. Guimont .....			1

## MONTMORENCY.\*

Ange Gardien .....	J. Paquet .....			1
" .....	H. Huotte .....		1	
Château Richer .....	E. Rhéaume .....		1	
Isle aux Reaux .....	N. Roberge .....			1
Ste. Anne de Beaupré .....	Edouard Morel .....		1	
Ste. Famille .....	Jos. Paul Blouin .....			1
St. Joachim .....	Seminary of Quebec .....		1	
St. Feréal .....	Edouard Gariépy .....			1
St. François, Isle d'Orléans .....	J. Coté .....		1	
St. Jean, I. O. .....	P. C. Bonin .....		1	
St. Pierre, I. O. .....	Joseph Lortie (Association) .....		1	
St. Tite des Caps .....	Edouard Gariépy .....			1

## MONTREAL.\*


## NAPIERVILLE.\*

St. Cyprien .....	D. Z. Guay .....			1
St. Michel Archange .....	J. Venchestin .....		1	
St. Rémi .....	Charles Huguet Latour .....		1	
" .....	Etienne Marleau .....		1	

## NICOLET.

Bécancourt .....	Philémon Brassard .....			1
" .....	A. Carignan .....			1
Gentilly Rivière .....	H. C. Fontaine .....			1
Nicolet parish .....	Napoléon Desfossés .....			1
" .....	Abraham Beaulac .....			1
" .....	M. G. Proulx .....	1		1
St. Angèle de Laval .....	Joseph Hébert .....			1
St. Brigitte des Saults .....	Joséph Lemire .....			1
St. Célestin, village .....	O. Fournier .....			1
" .....	Antoine Hébert .....			1
" Côte St. Pierre .....	Philémon Duguay .....			1



## NICOLET.—Continued.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
St. Célestin, range St. Joseph	J. Hébert			1
“ near C. P. R. depot	Jos. Piché			1
St. Edouard	Eusébe Houle			1
“	Onésime Fournier, range 2			1
“	“ 3			1
Ste. Eulalie	Luc Thibodeau & Hamcl.			1
“	Joseph Trudel			1
Stc. Gertrude	Eusébe Houle			2
“	Moise Girard			1
St. Grégoire	Luc Thibodeau			1
“ Vide Poehé	“			1
“ Beauséjour	“			1
“ Gde. Rivière	H. Dufresnc			1
“ Ht. du Village	O. Hébert			1
“ St. Charles	G. Houle			1
“ Laroehelle	Luc Forest			1
St. Léonard	J. Hébert			1
Stc. Monique, Village	Pothier & Milot			1
“ Cordeau	Chas. Milot			1
“ G. St. Esprit	Chas. Milot			1
“	Chas. Milot			1
“ dans l'Isle	Jos. Laforee			1
“	J. B. Beauchemin			1
Ste. Marie de Blandford	H. S. Cantin			1
St. Pierre les Becquets	Noé Mereure			1
“	Fred. Cinq Mars			1
Ste. Perpétue, village	Luc Girard			1
“	J. B. Beauchemin			1
Ste. Sophie de Lévrard	Damase Dubuc			1
“	Paul Barabé			1
St. Samuel				1
St. Wenceslas	Albert Thibodeau			1

## OTTAWA.

Allumette Island	J. E. D. Gareau			1
East Templeton	David Meilleur			2
Early	Simpson			1
“	Simpson			1
L'Ange Gardien	Damase Meilleur			1
Lochaber Wcst.	R. McLachlan Co.			1
Montebello	Ferdinand Hunault			1
N. D. de Bonsecours	Napoléon Hunault			1
St. Angélique	T. Bonhomme			2
“ Plaisance	“			1
Rupert	William T. Gibson			1
St. André Avelin	Hilaire Gareau			1
“	Louis Quesnel			1
Thurso	George Edward			1
Ste. Valérie de Ponsonby	Charles Libercent			1
Lochaber and Gore	McLaughlin Bros.			1
Masham	Samuel Gibson			1
Buckingham	Thos. Ross & Son			1

PA
Bristol
Clarendon
“
Onslow
Thorne
St. Alban
“
Cap Santé
“
“
Deschambault
“
St. Gilbert
Grondines
N. D. des Anges
“ de Portne
“
Pointe aux Tren
“
“
St. Augustin
St. Basile
“
Ste. Catherine
“
Ste. Jeanne de N
St. Raymond
“
St. Ubald
St. Casimir
“
“
Ecureuils
Charlesbourg
St. Edmond Stone
Ste. Foye
St. Gabriel
Beauport



## RICHELIEU.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
St. Aimé	Cheeserie of Village			1
"	Louis Lalancette			1
"	Esdras St. Germain			2
Ste. Anne de Sorel	Napoléon Latraverse & Co.			1
St. Louis de Bonsecours	Antoine St. Martin			1
St. Marcel	Roch Guilbeault			1
"	Houde & Sen			1
St. Ours (town)	Pierre St. Germain & Co.			1
" (parish)	Ambroise Larivière & Co.			1
" (lower)	Association			1
" (creek)	Clodimir Millette			1
" (Sarasteau)	Edouard Durocher			1
" (Bord de l'eau)	Pierre St. Germain			1
St. Robert	Paquin & Dufault			1
"	E. St. Germain			1
St. Roch	Alexis Collet			1
Ste. Victoire	Hercule Paul Hus			2
Sorel (parish)	St. Germain & Co			1

## RICHMOND.

Brompton Falls	Arthur Martel			1
Danville St. Anne	Rd. G. Caron, sec.treas		1	.....
"	A. McCallum			1
Melbourne	John Watson			1
"	Duncan McLeod			2
"	Duncan Stalker			1
"	James Dunbar			1
Shipton	J. de L. Taché			1
St. George de Windsor	A. Genest			1
"	George Richer			1
"	Adelard Marcotte			1
"	Aimé Thibodeau			1
Spooner Pond Cleveland	J. P. Lefebvre			1
Brompton	H. Darby			1
Windsor (Hardwood Hill)	M. Bégin, manager			1
"	Pierre Kirouac			1
"	Bernard Quinn			1
Dennison Mills	J. de L. Taché			1

## RIMOUSKI.\*

Rimouski	Ernest Simard		1	.....
Rivière Blanche	Chs. D. Bégin		1	.....
"	H. Parent		1	.....
Sandy Bay	L. P. Aubert		1	.....
N. D. de l'Assomption	Phamphile Aubert		1	.....
St. Anaclet	Arthur Marman			1
Ste. Cécile du Bic	Cheese Asso., 1st range			1
"	" 2nd range			1
St. Fabien	Cheese Asso.			1

PA

St. Fabien....  
 Ste. Luce....  
 St. Mathieu...  
 St. Simon....

L'Ange Gardien  
 " "  
 Canrobert....  
 N. D. de Bonse  
 " "

Ste. Angèle de  
 St. Hilaire....  
 St. Jean Baptis  
 " "

St. Césaire....

Ste. Marie de M  
 " "

Ste. Marie de M  
 St. Paul.....

St. Mathias....  
 " "

St. Michel de R  
 " "

N. D. de St. Hya  
 " "

St. Damase.....  
 " " Arger

Ste. Madeleine..

St. Charles.....

St. Denis, village  
 " "

" 3rd...  
 " 4th...

La Présentation..

St. Bernabé (Anci



## RIMOUSKI.—Continued.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
St. Fabien.....	Société de Beure.....		1	
St. Luce.....	Alph. Pelletier.....			1
St. Mathieu.....	Association.....		1	
St. Simon.....	Alph. Nicole & Gagnon.....		1	

## ROUVILLE.

L'Ange Gardien.....	Elie Bourbeau.....			1
".....	J. Lacoste.....			1
Canrobert.....	Arthur Pinsonneault.....			1
N. D. de Bonsecours.....	Ambroise Tétreau.....			1
".....	Joseph Ostigny.....			1
".....	Alfred Larivière.....			1
Ste. Angèle de Monnoir.....	Joseph Beaugregard.....			1
St. Hilaire.....	D. Benoit.....			1
St. Jean Baptiste.....	Edmond Chabot & Co.....			1
".....	Pierre Lambert & Co.....			1
".....	Louis Rémi & Co.....			1
".....	Eusebe Robert & Co.....			1
".....	Tétrault & Co.....			1
St. Césaire.....	H. Langevin.....		1	
".....	Frédéric Ménard.....			1
Ste. Marie de Monnoir.....	Frs. X. Marcoux.....			1
".....	Paul Gemme.....			1
".....	".....			1
".....	Hubert Gingras.....			1
Ste. Marie de Marieville.....	Joseph Bédard.....			1
St. Paul.....	Gord. Morrisson.....			1
".....	Thomas Carignan.....			1
St. Mathias.....	Alf. Bertrand.....			1
".....	Wm. Johnson.....			1
".....	Association.....			1
St. Michel de Rougemont.....	Delage Damase.....			1
".....	Paul Birs.....			1

## ST. HYACINTHE.\*

N. D. de St. Hyacinthe.....	J. M. Archambault.....			1
"..... Grand Range	U. Brievenu.....			1
St. Damase.....	Corbin Cheesery.....			1
".....	Pont.....			1
"..... Argenteuil	Jacques Jodoin.....			1
Ste. Madeleine.....	U. Chabot.....			1
".....	C. Letourneau.....			1
St. Charles.....	Nap. Pratte.....			1
St. Denis, village.....	J. B. Phaneuf.....			1
".....	A. Goulet.....			1
"..... 3rd.....	P. Auger.....			1
"..... 4th.....	Frs. Allard.....			1
La Présentation.....	M. Piché.....			1
".....	Camille Letourneau.....			1
St. Bernabé (Anciennc).....	Ed. Ménard.....			1

## ST. HYACINTHE.—Continued.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
St. Bernabé (Neuve).....	M. Lucas.....			1
Rang Double.....	Société de Fromagerie.....			1
St. Jude.....	P. Comeau.....			1
".....	A. Germain.....			1
Ste. Rose.....	Cléophas Lussier.....			1

## ST. JOHN.\*

Lacadie.....	Gonzague Conturier.....		1	
St. Bernard de Lacolle.....	J. B. Massé & Co.....			1
St. John.....	Jules Ménard.....			1
St. Valentin.....	Georges Bouchard.....			1
" (Girard).....	Alfred Nolin.....			1

## ST. MAURICE.\*

St. Barnabé.....	Arthur Milot.....			1
".....	Joseph Ringuet.....			1
".....	Wilfrid Ayotte.....			1
".....	Edouard Paquin.....			1
".....	Pierre Corriveau.....			1
St. Elie.....	Ludger Rivard.....			1
St. Etienne des Grès.....	Ulderic Brunelle.....			1
Ste. Marguerite.....	Léonard Milot.....			1
Shawenegan.....	Association.....			1
".....	Geo. Boland.....			1
".....	Léonard Milot.....			1
Pointe du Lac.....	O. Duplessis.....			1
".....	Pointe du Lac.....			1
St. Sévère.....	Euchariste Lamy.....			1
".....	Arthur Milot.....			1
Yamachiche.....	Adrien Milot.....		1	
".....	Léonard Milot.....			1
".....	Roy.....			1
Banlieue des Trois Rivières.....	Hormisdas Duval.....			1

## SHEFFORD.

Ely Valcourt.....	Hypolite Bombardier.....			1
".....	Aza Darby.....			1
".....	Nathan Darby.....			1
".....	Louis Brazeau.....			1
".....	Antime Brazeau.....			1
".....	Modeste Choinière.....			1
".....	Hilaire Girouard.....			1
".....	T. Vincelette.....			1
Ely North.....	Napoleon Salois.....			1
".....	Jos. Morin.....			1
Granby.....	Hector Belisle.....			1
".....	Chas. Booth.....			1

Granby.....

P

Roxton Falls.....

St. Joachim.....

Shefford.....

Stukely North.....

Laurenceville.....

Stukely South.....

Ste. Cécile de M.....

Ste. Pudentienn.....

St. Valérien.....

Waterloo.....

Ascot.....

Corner.....

Lenoxville.....

Sherbrooke.....

SHEFFORD—Continued.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
Granby	Jas. Ryder			1
"	Ed. Bradford			1
"	Hector Beaugregard			1
"	Jas. Duncan			1
"	Pierre Allard			1
"	Gordon Morrisson			1
"	Erl Smith			1
"	H. Rocheleau			1
"	Andrew Fossy			1
"	Louis Salois			1
Roxton Falls	Théodule St. Onge			1
"	Jos. Beaugregard			1
"	Louis Brazeau			1
"	Aubertin & Descarrie			1
St. Joachim	Nap. Côté			1
"	L. E. P. Casavant			1
Shefford	Jérémie Bachand			1
"	L. E. Richardson			1
"	Gédéon Boulé			1
"	Edw. Booth			1
"	James Doonan			1
"	Augustin Voyer			1
"	Thos. Booth			1
"	Théophile Bouregard			1
Stukely North	Jas. Hawkins			1
"	H. Ballard			1
"	Robert Roberts			1
"	L. Brouillé			1
Laurenceville	J. P. Lefebvre			1
Stukely South	R. E. Scott			1
"	Mag. Fleurant			1
"	Ozias Gingras			1
Ste. Cécile de Milton	Robert & Rochon			1
"	Fournier			1
Ste. Pudentielle	Henry Purdy			1
"	Mrs. U. Reynolds			1
"	W. X. Purdy			1
"	Isidore Brunel			1
"	Alex Desmarais			1
St. Valérien	Dupras Asso			1
"	Arthur Marsan			1
"	Paquette	1		.....
"	Désiré Chaput			1
Waterloo	Thos. Booth			1
"	Thos. Beaugregard			1

SHERBROOKE.

Ascot	R. J. Sorel			1
" Corner	Duplin			1
Lenoxville	W. Morris		1	.....
Sherbrooke	J. A. Camirand		1	.....



## SOULANGES.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
Coteau du Lac.....	Jos. A. Bourbonnais.....		1	
St. Clet.....	J. B. Marleau.....		1	
St. Joseph.....	Emery Lécuyer.....		1	
".....	Samuel Leroux.....		1	
".....	Godefroi Constant.....		1	
St. Polycarpe.....	J. Hector Leclair.....		1	
St. Téléphore.....	Louis Joseph Chénier.....		1	
St. Zotique.....	McPherson.....			1
Rivière Beaudette.....	Methot.....		1	

## STANSTEAD.\*

Barnston.....	G. B. Hall.....			1
".....	A. W. Martin.....			1
".....	H. E. Corliss.....			1
".....	W. W. Health.....			1
".....	Carmi Taylor.....			1
".....	D. L. Taylor.....			1
".....	W. K. Baldwin.....			1
".....	J. D. Morrisson.....			1
Dixville.....	F. Martin.....			1
Hatley.....	J. D. Morrisson.....			1
".....	Bérard & Rayvill.....			1
".....	Rev. F. X. Michon.....			1
Magog.....	E. J. Merry.....			1
Stanstead.....	Wm. Taylor.....			1
".....	E. A. Baldwin.....			1
".....	W. S. A. Buck.....			1
Barford.....	O. Trudeau.....			1
".....	A. Gérin.....			1
".....	A. W. Martin.....			1
Coaticook.....	Jas. Mullins.....			1

## TEMISCOUATA.

Isle Verte.....	Préfontaine & Bro.....		2	
Cacouna Village.....	".....		1	
" Station.....	".....		1	
St. Arsène.....	Théophile April & Co.....		1	
St. Clément.....	Pierre April & Co.....		1	
St. Eloi.....	Théophile April & Co.....		1	
St. Epiphane.....	McPherson & Taché.....		1	
St. Jean de Dieu.....	Joseph Massé.....		1	
St. Paul de la Croix.....	Thomas Beaulieu.....		1	
Trois Pistoles.....	Thomas Pelletier & Co.....		1	

## TERREBONNE.

Ste. Adèle.....	W. Grignon.....		1	
Ste. Agathe.....	Grégoire L'aveline.....		1	
St. Janvier.....	N, E. Clément.....			1
St. Jérôme.....	Israël Dion.....		1	

PA

St. Jovite.....  
Ste. Anne des  
St. Sauveur.....".....  
".....  
".....St. Thérèse v.....  
".....  
".....".....  
".....  
".....Ste. Sophie.....  
".....L'île Perrot.....  
Rigaud village....." parish.....  
Ste. Marthe.....T. S. Rédempte.....  
Vaudreuil villaq....." paris.....  
".....Peveril.....  
Pointe Fortune.....Contrecoeur.....  
St. Antoine.....".....  
".....Ste. Julie de Ver.....  
Ste. Théodosie.....St. Marc.....  
".....Belœil.....  
" Ruisseau.....Ham North.....  
".....Ham South.....  
Garthby.....

St. Adrien.....

## TERREBONNE.—Continued.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
St. Jovite	Adolphe Desjardins		1	
Ste. Anne des Plaines	Phileas Desormiers		1	
St. Sauveur	John Kimpton		1	
“ Piedmont	Albert Kimpton		1	
“ Côte St. Lambert	E. Brosseau		1	
“ Côte St. Gabriel	E. Brosseau		1	
Ste. Thérèse village	Rev. Joseph Labonté, Ptre.		1	
“ parish	Alexander Miller		1	
“	Damien Leclair		1	
“	Albert Garth		1	
“	Jos. Gratton		1	
Ste. Sophie	Louis Brault		1	
“	L. J. A. Lambert		1	

## VAUDREUIL.\*

L'Île Perrot	Antoine Daoust		1	
Rigaud village	Eugène Séguin			1
“ parish	Joseph Séguin			1
Ste. Marthe	Peter Monahan			1
“	Aldéric Séguin			1
T. S. Rédempteur	George Valois		1	
Vaudreuil village	Amedé Castonguay		1	
“ parish	Paul Denis		1	
“	Athanase Bimer		1	
“	Basile Charlebois		1	
Peveril	McLeod			1
Pointe Fortune	Thos. Ross & Co.			1

## VERCHÈRES.

Contrecoeur	D. Charron			1
St. Antoine	L. J. Cartier & Co.			1
“	Napoléon Birtz			1
“	Elie Gaudette			1
Ste. Julie de Verchères	Louis Blain			1
Ste. Théodosie	Bruno Larose			1
St. Marc	Gaspard Leroux			1
“	Alex. Chicoine		1	
Belœil	Belœil Village Cheese Co.			1
“ Ruisseau	Felix Blain			1

## WOLFE.

Ham North	L. Cloutier			1
“	Alfred Morin			1
“	Herménégilde Guertin			1
Ham South	Charles Béliveau			1
Garthby	Thomas Jacques			1
St. Adrien	N. Brochu			1

## WOLFE.—Continued.

PARISHES.	NAMES OF PROPRIETORS.	C. C.	Creameries	Cheeseries.
Ste. Agnes, Tetreau Mills	Chas. Lougre			1
"	Nort. Plante			1
St. Camille	J. de L. Taché & J. P. Lefebvre			1
"	Co-operative		1	
St. Fortunat	Lazare Massue			1
"	Joseph & Narcisse			1
"	France Beaudoin			1
St. Julien	Louis Gilbert			4
"	Gilbert & Morin			1
St. Gabriel	Gédéon Heon			1
"	Walter Hébert			1
Weedon	Ouellette			1
" Centre	Simon Fontaine			1
"	Francis Ouellet			1
Lake Weedon	Francis Ouellet			1
Township of Weedon	Alphonse Fontaine			1
Wotton	J. de L. Taché		2	
"	Taché, Lefebvre & Lemire			1
"	Proulx & Co.			1
"	J. P. Lefebvre			1

## YAMASKA.

La Baie du Febvre	J. L. Lemire & Co.		1	2
"	J. N. Duguay			2
"	Charles Drouin			1
"	Allard, Lefebvre & Demers			1
"	"			1
"	Elie Proulx			1
"	"		1	
"	François Jutras			1
"	Grenier & Lemire			1
St. Bonaventure	Eusébe Proulx & Frère			1
"	M. Lanoie			1
St. David	Charles Cyr & Co.			1
"	Herménégilde Fontaine			1
"	J. Paré			1
"	Hormisdas Lebrun & Co.			1
St. Elphège	William Parent			1
"	Siméon Paquette			1
St. François du Lac	J. N. Duguay			2
"	Charles Cyr			1
St. Guillaume	Brodeur & Vigneau	1		
"	Boucher et Lanoie			1
"	"			1
St. Pie Deguire	Edmond Dauplaise			1
"	Charles Cyr			1
St. Thomas de Pierreville	William Parent			1
"	Ida Niquette			1
"	Armand Ally			1
St. Zéphirin	J. N. Duguay			5
"	Milot & Lupien			2
"	Cyprien Jutras			1
"	Evarist Boisvert & Co.			1
"	M. Simonneau			1
Yamaska West	Camiré & Parenteau			2
" East	Lafond & Thérout			1
"	Narcisse Parenteau & Co.			1

Cor

Argenteuil ...  
 Arthabaska ...  
 Bagot ...  
 Beauce ...  
 Beauharnois ...  
 Bellechasse ...  
 Berthier ...  
 Bonaventure ...  
 Brome ...  
 Chambly ...  
 Champlain ...  
 Charlevoix ...  
 Chateauguay ...  
 Chicoutimi ...  
 Compton ...  
 Deux-Montagne ...  
 Dorchester ...  
 Drummond ...  
 Gaspé ...  
 Hochelaga ...  
 Huntingdon ...  
 Iberville ...  
 Jacques Cartier ...  
 Joliette ...  
 Kamouraska ...  
 Lac St. Jean ...  
 Laprairie ...  
 L'Assomption ...  
 Laval ...  
 Lévis ...  
 L'Islet ...  
 Lotbinière ...





## SYNOPTIC TABLE OF THE

INSPI

		SYNOPTIC TABLE OF THE										INSPI	
Number of divisions.	Number of syndicates.	NAMES OF INSPECTORS.	Number of factories.	Number of days of inspection.	Number of short visits.	Number of tests made.	Number of letters written.	Number of fines levied.	Number of patrons.	Number of cows.	Weight of milk received.		
											Lbs.		
3	1	P. Veilleux.....	30	142	.....	.....	18	5	.....	.....	1	.....	
4	1	L. Gilbert.....	22	92	30	10,240	.....	8	514	.....	2	.....	
4	2	G. St. Pierre.....	25	107	36	2,288	.....	16	712	3,768	3	.....	
5	1	B. A. Pothier.....	25	113	64	2,002	70	3	963	5,772	4	.....	
5	2	W. Parent.....	29	150	131	4,727	10	19	1,225	.....	5	18,805,246	
6	1	T. Proulx.....	21	138	70	1,120	47	11	505	.....	6	.....	
6	2	P. A. Robillard.....	24	147	15	2,514	21	14	588	3,450	7	7,850,771	
8	1	P. St. Germain.....	17	.....	.....	2,419	37	3	.....	.....	8	.....	
8	2	E. Bounneau.....	25	142	.....	4,250	.....	8	1,436	6,156	9	15,857,827	
8	3	D. J. Parent.....	18	97	69	4,100	46	4	697	4,045	10	12,753,000	
10	1	A. Marsan.....	28	126	60	3,800	104	45	941	6,750	11	14,900,000	
10	2	Geo. W. Ferguson.....	17	133	140	4,100	40	4	457	5,190	12	12,514,312	
10	3	A. W. Woodward.....	34	137	38	4,268	11	1	700	8,425	13	.....	
10	4	A. McFarlane.....	23	150	75	3,835	40	4	661	7,115	14	10,260,000	
12	1	A. S. Lloyd.....	20	140	60	3,280	.....	8	673	5,240	15	11,145,909	
13	1	A. M. Ferguson.....	20	144	112	3,096	26	2	516	5,825	16	16,321,705	
14	1	F. Paradis.....	21	55	105	1,050	.....	1	350	3,800	17	.....	
15&16	1	F. X. O. Trudel.....	29	125	60	6,379	60	6	1,018	5,200	18	.....	
15&16	1	J. A. Plamondon.....	20	156	49	6,002	31	6	710	4,254	19	.....	
16	1	L. P. Lacourcière.....	20	108	31	5,421	48	6	731	4,405	20	7,124,900	
16	2	J. N. Allard.....	23	124	11	.....	.....	.....	.....	.....	21	.....	
17	1	U. Courchéne.....	.....	.....	.....	.....	.....	.....	.....	.....	22	.....	
19	1	J. W. Ross.....	21	152	200	2,351	48	4	536	4,360	23	.....	
		CREAMERIES.										24	.....
		D. U. Bernard (Bast Quebec),	16	100	.....	.....	.....	.....	.....	.....	.....	24	.....
		A. Després (Portneuf),	.....	.....	.....	.....	.....	.....	.....	.....	.....	25	.....
		J. E. Gaudet (Assomption),	.....	.....	.....	.....	.....	.....	.....	.....	.....	26	.....
		A. W. Kimpton (Terrebonne),	.....	.....	.....	.....	.....	.....	.....	.....	.....	27	.....

INSPECTOR'S REPORTS.

No.	Lbs.	Lbs.	\$	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Average cash received (making to be deducted).			Average price of cheese: Butter.
										Per Patron.	Per cow.	Per 100 lbs. milk.	
1	1												
2	2												
3	3			67,526									
4	4												
5	5	18,805,246	1,837,589	184,458									
6	6												
7	7	7,850,771	765,995	74,200	13397.	2275.	1302.	9-74	10 $\frac{1}{2}$	126-19	21-45	0-94	9 $\frac{1}{2}$
8	8												
9	9	15,857,827	1,630,886	153,192	11043.	2576.	1135.	10-28	9 $\frac{1}{2}$	106-67	24-88	0-96 $\frac{1}{2}$	9 $\frac{1}{2}$
10	10	12,753,000	12,750,000	104,770		1792.	1928.	9-96	10 $\frac{1}{2}$	158-50	14-72	0-94 $\frac{1}{2}$	9 $\frac{1}{2}$
11	11	14,900,000	1,525,000	148,687	15834.	2207.	1620.	10-23	9 $\frac{1}{2}$	158.	22-02	0-99 $\frac{1}{2}$	9 $\frac{1}{2}$
12	12	12,514,312	{ C. 950,000 B. 137,000	{ 92,625 28,700	27384.	2411.				265-63	23-39	0-97	9 $\frac{1}{2}$ 21
13	13												
14	14	10,260,000		88,000		2700.				251-42	23-15	0-85 $\frac{1}{2}$	
15	15	11,145,909	980,378	95,686	16561.	2127.	1457.	8-79	11 $\frac{1}{2}$	142-17	18-26	0-86	9 $\frac{1}{2}$
16	16	16,321,705	1,169,390	152,512	31631.	2802.	3041.	9-61	10 $\frac{1}{2}$	295-56	26-18	0-93 $\frac{1}{2}$	9 $\frac{1}{2}$
17	17												
18	18												
19	19												
20	20	7,124,900	769,440	69,390	9747.	1617.	1052.	10-79	9 $\frac{1}{2}$	96-25	15-74	0-98 $\frac{1}{2}$	9
21	21												
22	22												
23	23												
24	24												
25	25												
26	26												
27	27												

Number of patrons.	Number of cows.
514	1
712	2
963	3
1,225	4
505	5
588	6
3,459	7
	8
1,436	9
697	10
941	11
457	12
700	13
661	14
673	15
516	16
350	17
1,018	18
710	19
731	20
	21
	22
536	23
	24
	25
	26
	27

OF THE



## SYNOPTIC TABLE OF THE INSPECTORS' REPORTS.

As we stated at p. 2 (note), we here give the usual table of the recapitulation of the reports of the inspectors. We find to our great regret that the majority of the inspectors have this year furnished us with very defective reports, not having properly prepared themselves. They have received, for the season 1894, more accurate instruction, and will be provided in due season with the necessary blank forms. The Association wishes the secretaries of the factories to give the syndicate-inspectors all the information required by them; this information is confidential, and has no other object in view than to enable the association to draw up the average and general statistics that appear in the above table. The comparison of the yield of milk, of the yield of butter or cheese, of the price of milk, butter or cheese, in the different counties of the country, must be of general interest, and the Association believes that this information should be brought before the public as one way of promoting the dairy-industry of our province. It counts, therefore, upon the generous assistance of all the true friends of a great national industry.

N. B.—The low price of milk, comparatively speaking, will be observed (lines 14 and 15). It is possible that the inspectors of these syndicates have given us as the *amount of money received* the sum divided among the parties, instead of that received from the buyers, which would give for these two counties the *net* average of money received, instead of the *gross* average set down for the other counties.

LECT

Messrs.

Allard, J. N.  
Angers, Hon  
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