SEVENTEENTH REPORT

OF THE

DAIRYMEN'S ASSOCIATION

OF THE

PROVINCE OF QUEBEC

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

1898

QUEBEC.

PRINTED BY CHARLES PAGEAU,

PRINTER TO HER MOST EXCELLENT MAJESTY THE QUEEN

1899

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To the Hon

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SEVENTEENTH ANNUAL REPORT

OF THE

DAIRYMEN'S ASSOCIATION

OF THE

PROVINCE OF QUEBEC.

To the Hon. Commissioner of Agriculture,

Quebec.

SIR,—

The Board of Directors of the Dairymen's Association of the Province of Quebec has the honor to offer you the following report of its operations during the year 1898, and of the Annual Meeting held at Valleyfield, 6th and 7th December last.

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

EMILE CASTEL.

St. Hyacinthe, March 1st, 1899.

OFFICERS AND DIRECTORS OF THE DAIRYMEN'S ASSOCIATION

FOR 1899.

Honorary President: M. MILTON MACDONALD, M. P. P., Actonvale, Que.
President: M. J. A. VAILLANCOURT, Montreal.
Vice-President: M. J. C. CHAPAIS, St. Denis de la Bouteillerie, Que.
Secretary-Tresurer: M. EMILE CASTEL, St. Hyacinthe.

DIRECTORS:

DISTRICT	NAMES	RESIDENCE
Arthabaska	Messrs. D. O. BOURBEAU	Victoriaville.
Beauce	J. DE L. TACHÉ	St-Hyacinthe.
Beauharnois	ROBERT NESS	Howick.
Bedford	C. H. PARMELEE, M. P.	Waterloo.
Charlevoix and Saguenay	J. D. GUAY	Chicoutimi.
Chicoutimi	JOS. GIRARD, M. P. P.	St-Gédéon, Lac St-Jean.
Gaspé	ALEXIS CHICOINE	St-Marc, Verchères.
Iberville	EDOUARD MCGOWAN	Ste-Martine, Chat.
Joliette	SAM. CHAGNON	St-Paul l'Ermite.
Kamouraska	FRANÇOIS GAGNON	St-Denis de la Bouteillerie.
Montmagny	M. L'ABBÉ F. P. COTÉ	St-Valérien, Shefford.
Montreal	J. H. SCOTT	Montréal.
Ottawa	LOUIS LABELLE	St-Jérôme, Terreb.
Quebec	N. GARNEAU, M. P. P.	Ste-Foye, Qué.
Richelieu	J. L. LEMIRE	La Baie du Febvre.
Rimouski	CHS. PRÉFONTAINE	Isle Verte.
St-François	L'ABBÉ V. CHAREST	Sherbrooke.
St-Hyacinthe	L. T. BRODEUR	St-Hugues, Bagot.
Terrebonne	L'ABBÉ COUSINEAU	Ste-Thérèse, Terrebonne.
Three Rivers	CHARLES MILOT	Ste-Monique, Nicolet.

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. 61, s. 1.

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

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

1751. Such declaration shall be made in duplicate, one to be written and signed on the first page of a book to be kept by the association for the purpose of entering therein the minutes of their proceedings, during the first year of the establishment of such association, and the other shall be immediately transmitted to the Commissioner of Agriculture and Colonisation, who shall, as soon as possible after its reception, cause to be published, a notice of the formation of such society in the Quebec Official Gazette. 45 V., c. 66, s. 3; 50 V., c. 66, s. 4.

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

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

"**1753***a*. 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, for 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.

"**1753***b*. 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 1753*d*.

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.

"**1753***c*. 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.

"**1753***d*. 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.

"**1753***e*. 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-president, a secretary-treasurer and also one director for each judicial district of the Province, chosen from among the members of the Association, domiciled in such districts. 45 V., c. 66, s. 7.

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

SCHEDULE

MENTIONED IN ARTICLE 1750.

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

NAMES.	$	Cts.

45 V., c. 66, Schedule.

52 VICT. 1899 CAP. 22, QUEBEC.

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

Assented to 21*st March*, 1889.

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

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

SECTION XIV.

FARMERS' AND DAIRYMEN'S ASSOCIATIONS.

"**1755***a*. The Lieutenant-Governor in Council may authorize the formation in each judicial district of the Province of an association, having for its object the promotion of agriculture, the improvement of 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

"**1755***b*. 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.

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

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

"**1755***e*. 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.

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

"**1755***g*. 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 formation of the association is published in the Quebec Official Gazette.

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

"**1755***i*. 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.

"**1755***j*. The board of directors shall elect, from their members, a president and 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.

"**1755***k*. 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 as shall be deemed useful and in the interest of agriculture and the dairy industry.

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

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

SCHEDULE.

MENTIONED IN ARTICLE 1755*b*.

We, the undersigned, agree to form ourselves into an association under the provisions of section fourteenth of chapter seventh of title fourth of the Revised Statutes of the Province of Quebec, respecting Farmers' and Dairymen's Associations, and we hereby severally agree to pay to the secretary-treasurer,

annually, while we continue members of the association, the sums opposite our respective names, and we further agree to conform to the rules and by-laws of the said association.

NAMES.	$	Cts.

SECTION III.

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

(R. S. P. of Q., Art. 5477 to 5483.)

§ 1.—*Formation of such Societies.*

5477. When in any part of the province, five or more persons shall 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 intend to do business, such persons and all such other persons as may thereafter become members of such society, their heirs, executors, curators, administrators, successors and assigns, respectively, shall constitute a body politic and corporate, under the name of "butter and cheese manufacturing society (or both as the case may be) of (name of the place and number of the manufactory as mentioned in the declaration.)"

The prothonotary shall deliver to such company a certificate stating that such declaration has been made, which certificate shall be registered in the registry office of the place in which 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 provision 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., 15, s. 9.

§ 2—*General Powers and Duties.*

5479. Every such society so formed, for the purposes for which it has been established, shall enjoy all the powers vested in ordinary corporations, especially that of choosing officers from among its members, of passing by-laws not contrary to the laws of this Province, to determine the number of its members, for its 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 the section. 45 V., c. 65, s. 12.

SCHEDULE

IN ACCORDANCE WITH ARTICLE 5478.

We, the undersigned, agree to form ourselves into an association in virtue of paragraph one of the third section of the fourth chapter of the eleventh title of the Revised Statutes of the Province of Quebec, to be entitled "The Association for the manufacture of butter *(or)* cheese, *(or)* of butter and cheese, of the parish of county of , and we pledge ourselves to conform to all the rules and by-laws of the said association.

(Signatures) 45 Vic., c. 65, Schedule.

49 VICT., CAP. XLII., OTTAWA.

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

Assented to 2nd June, 1886.

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

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

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52 VICT., CAP. XLIII., OTTAWA.

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

Assented to 2nd May, 1889.

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

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

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

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

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

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

5. Every person who, by himself, or by any other person to his knowledge, violates any of the provisions of the preceding sections of this Act, shall, for each offence, upon conviction thereof before any justice or justices of the peace, forfeit and pay a fine not exceeding fifty dollars and not less than five dollars, together with 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 costs of enforcing the same, be sooner paid.

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

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

8. In any complaint or information made or laid under the first or second sections of this Act, and in any conviction thereon, the milk complained of may be described as deteriorated milk, without specification of the cause of deterioration, and, thereupon, proof of any of the causes or modes of deterioration mentioned in either of the said two sections, shall be sufficient to sustain conviction. 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 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 offense under this Act, and the husband or wife of such person, shall be competent and compellable to testify.

11. Any pecuniary penalty imposed under this Act shall, when recovered, be payable one-half to the informant or complainant, and the other half to the owner, treasurer or president of the manufactory to which the 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.

CONSTITUTION OF THE DAIRYMEN'S ASSOCIATION.

(*Incorporated by Q. R. S.*, 1749 *to* 1755 *and schedule.*

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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 of 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 elected the candidate who shall have the majority of votes.

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

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

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

10. To the secretary-treasurer shall be entrusted all the moneys and other valuables belonging to the association ; he shall keep, in a special register, minutes of all meetings of the association as well as of the board of directors, and these minutes shall be signed by the president, or, in his absence, by the vice-president, and by the secretary-treasurer : he shall besides, keep books in which shall be entered, regularly and without delay, all the monetary operations of the associations. 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 by the board, and the board shall also nominate the directors for those judicial districts which may not as yet be 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 meeting 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 laid 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 DAIRYMEN'S 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 authorized 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 establishments so organised into syndicates ;

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

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

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

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

I

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 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, Arthasbaka.
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.....Verchères, Chambly, Laprairie, Napierville.
12.....Beauharnois, Châteauguay.
13.....Huntingdon.
14.....Saguenay, Lac St. Jean, Chicoutimi, Charlevoix.
15.....Portneuf, Quebec, Montmorency.
16.....Three-Rivers, Champlain, St. Maurice, Maskinongé.
17.....Montcalm, Joliette, Berthier, l'Assomption.
18.....Hochelaga, J.-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 shall 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 especially to the time of year following the issue of each number; it shall also contain general information in connection with the dairy industry.

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

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

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

b. Through its ordinary officers, as regards all private or public communications it may have to make to the representatives 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 bookkeeping, sufficient to insure the exactness and integrity of the operation of the year, which each factory will have to furnish to the association.

III.

ORGANISATION AND WORKING OF THE SYNDICATES.

1. A syndicate shall be constituted by the associating together of creameries, cheese-factories, or other dairy establishments, to the number of not fewer than (15) fifteen, or more than (30) thirty; it shall have for its aim the 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 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 shall conform to the present regulations.

2. The syndicate 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 representatives of the factories associated into a syndicate shall name a president, a vice-president, and a secretary-treasurer, who shall be the officers of the syndicate and whose addresses 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, etc., etc.

11. As the government grant is given specially for the service of inspection, this grant in no case shall exceed the half of the genuine amount of the expenses alone just mentioned, provided that half 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.

12. A subscription shall be paid by the proprietors, or by the representatives of each factory, to the Dairymen's Association, or to the dairy association of the district in which the syndicate is formed, in order that the makers or the directors may be kept *au courant* of the work of the association; moreover, they shall forward to the 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 other inspectors by the syndicates.

2. The duties of the inspectors belonging exclusively to the teaching of the best methods for 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 certainly 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 the most guarded discretion in regard to all matters they note in the exercise of their duties, and reveal them to no one except to the society or to the officers and servants of the factories concerned.

§ 1. OF THE INSPECTOR-GENERAL.

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

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

3. After the opening of the season, the Inspector-General shall keep himself in communication with the inspectors of syndicates by going at different times to pass two or three days alternately with each of them, to ascertain the efficiency of the factories they have in charge. In these visits, the Inspector-General shall 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 establishment 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; the 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 the servants of the syndicates, and as regards questions of interior management, such as wages, payment of expenses, &c., are under the control of the officers of the syndicates.

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

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

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

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

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

7. After having thus made himself acquainted with the situation of affairs, and having helped each maker, in proportion to his needs, with his assistance and advice, the inspector shall arrange his visits so as 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, bad roads, 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 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 an abstract 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, if he desire it, may 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, of the maker, or of the president of the directors of any factory, communicate to such persons the tenor of such notes of his as concern that factory.

14. In all cases, wherein he shall see need of making observation, 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.

2. This board shall settle, and publish immediately, a programme of the examination to be passed by the candidates for the office of inspector to give them a right to a certificate of competence ; it shall, at the same time, give the date and the place of 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 other grave cause, shall be considered unfitted to discharge his duties properly.

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

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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, 18*

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 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 offense, 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 labor, for a term not exceeding three months, unless such fine and the costs of enforcing it are sooner paid.

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 or butter has 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, 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 labor, 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 cost of prosecution, and in default of payment of such fine and costs shall be liable to imprisonment, with or without hard labor, 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 *primâ 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 made in that behalf.

60-61 VICTORIA.—CHAP. 21.

An Act to provide for the Registration of Cheese Factories and Creameries, and the Branding of Dairy Products, and to prohibit misrepresentation as to the dates of Manufacture of such Products.

[*Assented to 29th June, 1897.*]

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 Act*, 1897.

2. The Minister of Agriculture shall keep in the Department of Agriculture a book to be called "The Cheese Factories and Creameries Register," and any person engaged in the business of cheese or of butter making may apply to the Department of Agriculture, at Ottawa, for the registration of the cheese factory or creamery owned or duly represented by him; and, on receipt of the particulars as set forth in schedule to this Act, the Minister of Agriculture, or such officer of the Department of Agriculture as is designated by the Governor in Council, shall forthwith send to the owner or representative of such cheese factory or creamery a certificate showing the registration number allotted to such cheese factory or creamery.

3. The person to whom such registration number is assigned shall thereafter have the exclusive right to use it for the purpose of designating the dairy products manufactured by him at such cheese factory or creamery, in the manner shown in schedule B to this Act.

4. No person shall sell, offer, expose, or have in his possession for sale, any butter or cheese made in Canada, and destined for export therefrom, unless the word "Canadian," "Canadien," or "Canada" is printed, stamped or marked in a legible and indelible manner, in letters not less than three-eighths of an inch high, and one-quarter of an inch wide, upon—

(*a*) the box or package containing the butter or cheese, and—

(*b*) moreover, in the case of cheese, upon the cheese itself, before it is taken from the factory where it was made.

5. No person, with intent to misrepresent, shall remove or in any way efface, obliterate or alter the word "Canadian," "Canadien," or "Canada," or the registration number on any cheese, or on any box or package which contains cheese or butter.

6. No person shall knowingly sell, or offer, expose, or have in his possession for sale, any cheese or butter upon which, or upon any box or package containing which, is printed, stamped or marked any month other than the month in which such butter or cheese was made; and no person shall, knowingly and with intent to misrepresent, sell, or offer, expose, or have in his possession for sale, any cheese or butter represented in any manner as having been made in any month other than the month in which it was actually made.

7. Every person, who, by himself, or by any other person to his knowledge, violates any of the provisions of sections four, five and six of this Act shall, for each offence, upon summary conviction, be liable to a fine not exceeding twenty dollars and not less than five dollars, for every cheese or box, or package of butter or cheese which is sold, or offered, exposed, or had in his possession for sale, contrary to the provisions of those sections, together with the costs of prosecution, and, in default 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.

8. 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.

9. 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.

SCHEDULE A.

Particulars for the registration of cheese factories and creameries:

1. Name of cheese factory or creamery.....

2. Where situated:—

(*a.*) Province .....

(*b.*) County.....

(*c.*) Township or parish.....

(*d.*) Post office.....

(*e.*) Telegraph or telephone office.....

(*f.*) Railway-station or shipping port.....

3. Name of owner.....

Post office address.....

If a co-operative dairy association or joint-stock company :—

Name of secretary.....

Post office address.....

4. Registered brand or trade-mark, if any.....

4. Registered number allotted.....

The above is certified correct.

.....Owner.

.....P. O. Address.

.....Secretary.

.....P. O. Address.

Witness.....

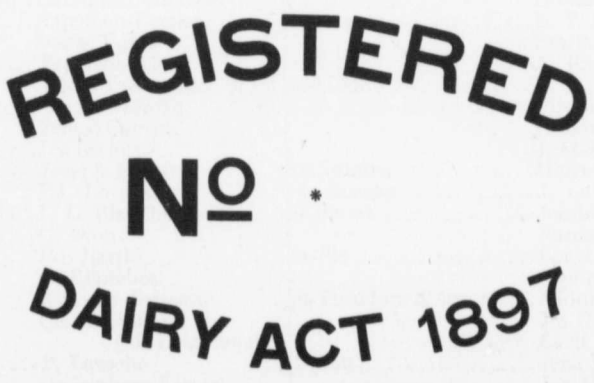
.....P. O. Address.

Witness.....

.....P. O. Address.

SCHEDULE B.

Form of brand for registered number to be allotted to cheese-factories and creameries :—



*The figure or figures of registration to be inserted.

DAIRY

PARISH OR P. O. B.
Brownsburg...
Cushing .....
Cambria .....
Dalesville.....
Grenville .....
Harrington ...
Hill Head.....
Lachute .....
Mabel .....
Mille Isle .....
St-Andrews...
St-Philippe....
Stonefield .....
Arthabaskaville
Rivière Noire..
Ste-Clotilde....
Ste-Elizabeth d'
St-Louis de Bla
St-Norbert.....
St-Patrick's Hil
St-Phillippe de
St-Rémi de Ting
St-Valère de Bu
Stanfold .....
Tingwick.....

LIST OF THE MEMBERS

OF THE

DAIRYMEN'S ASSOCIATION OF THE PROVINCE OF QUEBEC

FOR THE YEAR 1898.

PARISH OR P. O. B.	NAMES.
ARGENTEUIL.	
Brownsburg	Thos Ross & Sons, Monaléa No 5.
Cushing	" " " No 2.
Cambria	" " " No 16.
Dalesville	" " " No 12.
Grenville	" " " No 11.
Harrington	" " " No 14.
Hill Head	" " " No 10.
	John A. Morrisson.
Lachute	Thos Ross & Sons, Monaléa No 19.
	" " " No 8.
Mabel	" " " No 13.
Mille Isle	" " " No 17.
St-Andrews	A. C. McPhee.
	F. H. Hooker.
	Thos Ross & Sons, Monaléa No 9.
St-Philippe	" " " No 6.
Stonefield	John H. Derrick.
	Xavier Desforges.
ARTHABASKA,	
Arthabaskaville	Emile Payan.
	Eugène Pellerin.
	Arthur Leblanc.
	Uldéric Beaudoin.
Rivière Noire	P. Leclerc.
Ste-Clotilde	Louis Boulanger.
Ste-Elizabeth d'Auteuil	Edmond Desfossés.
St-Louis de Blandford	Napoléon Fortier.
	Donat Desfosés.
St-Norbert	Napoléon Alain.
	Alfred Dusseault.
St-Patrick's Hill	Xavier Moreau.
	Ernest Cantin.
St-Phillippe de Chester	Jos Leclerc.
St-Rémi de Tingwick	Joseph Proulx.
	Ed. Levasseur.
St-Valère de Bulstrode	J. L. Blanchette.
Stanfold	C. Dion.
	Ed. Baril.
	G. Blanchet.
	Antonio Brissette.
	Cie de Stanfold (M. Delagrave).
Tingwick	P. Laroche.
	Onésiphore Lemay.
	F. V. Lessard, N. P.

PARISH OR P. O. B.	NAMES.
ARTHABASKA—*Con.*	
Trout Brook	P. D. Larivière.
Trottier P. O	Louis Goulette.
Victoriaville	D. O. Bourbeau.
	Tourigny et Naud.
	G. St-Pierre.
Warwick	An. Bergeron.
	Révd M. Méthot.
	Emile Morin.
	Philippe Robitaille.
	Emélie Pothier.
	Nazaire Vidal.
BAGOT.	
Acton Vale	Milton MacDonald M.P.P
	Louis Bourgeois.
	Adolphe Lécuyer.
St-Dominique	Pierre Chicoine.
	Emile Chagnon.
	Euclide Lapalme.
	Ph. Dusseault.
	Norbert Frédette.
St-Ephrem d'Upton	Jos Cartier, fromager.
	Alfred Vanier.
	Chryso. McDuff.
Ste-Hélène	Rvd. J. U. Charbonneau.
	Michel Houle, fromager.
	Houle & Millier.
St-Hugues	L. T. Brodeur.
	Emile Lefebvre.
	A. Brasseur.
St-Liboire	F. X. Brunette.
	Joseph Lemonde.
	Honoré Charland.
	J. St-Pierre.
St-Nazaire	Hormisdas Parenteau.
Ste-Rosalie	J. Laliberté.
St-Simon	Joseph Dupont.
	Narcisse Tétreault.
St-Pie	Louis Breton.
	Alphonse Morin.
St-Théodore d'Acton	Isidore Jodoin.
	Jos Gaumond.
	Ls de Grand Pré.
Upton	Jean Maurice.
	Jos Normandin.
	Louis Côté.

PARISH OR P. O. B.	NAMES.
BAGOT—*Con.*	
Upton	Drolet Hétu.
	G. E. Hétu.
BEAUCE.	
Adstock	J. N. Duguay.
East Broughton	Pierre Gagnon.
Providence	Charles Bolduc.
S.-C. de Jésus East Broughton	Vital Champagne.
Saints-Anges	Ferdinand Mercier.
	Gédéon Labbé.
	Henry Giguère.
	Philippe Grégoire.
St-Benoit Labre	Omer Poulin.
St-Elzéar	Appollinaire Drouin.
	Richard Lessard
	Joseph Guay
	Siméon Maheux
St-Ephrem de Tring	Octave Roy, Propriétaire
	Damase Lussier
St-Evariste de Forsyth	Louis Bernier
St-François	Philias Rodrigue
	Vital Pépin
	Léger Roy (Riv. Gilbert)
	Jean Fortin
	Chas Veilleux, fils de Léger
	Jos. Bernard, fils d'Elzéar
	Philias Veilleux
	John Doyon
	Alphonse Doyon
	Charles G. Veilleux
	Rvd L. Z. Lambert, Ptre
St-Frédéric	F. X. Plante
St-Gédéon Marlow	Joseph Charpentier
St-Georges	Rvd Th. Montminy
	Wenceslas Talbot
	David Poulin, fils de Jos.
	Olivier Caron
	Joseph Paquette
	John Goslin
	Bénoni Poulin
	Arthur Bolduc
	Adalbert Loubier
	David Poulin, fils de Gaspard
	Joseph Maheux
St-Honoré de Shenley	J. O. Nadeau
St-Joseph	Noël Roy
	Rodolphe Gagné
	Ephrem Tardif
	Clotaire Lessard
	Evariste Poulin
	Thomas Doyon
Ste-Marie	Louis Ernest Faucher
	Henry Havard
	Marcoux et Jolicœur

PARISH OR P. O. B.	NAMES.
BEAUCE—*Con.*	
Ste-Marie	Vital Cliche
	Jean Faucher
St-Martin	Gédéon Pépin
	Thomas Maheux
Scott Junction	William R'Haven
	P. de Bacourt
BEAUHARNOIS.	
Beauharnois	Ovila Harelle
Landreville	Alexis Lemieux (3)
	William Durnin (3)
St-Etienne	L. Laberge
	G. Brosseau
St-Louis de Gonzague	H. Lepage
	D. M. Macpherson ch. fy.
	A. Lepage
	A. Pilon
St-Timothée	O. Ringuette
Valleyfield	Lloyd & McBean
	Louis Simpson
Vendôme	A. Allard
	I. Gendron
BELLECHASSE.	
St-Charles	Onésime Mercier
St-Damien	Rvd J. O. Guimont
St-Michel	J. Fidèle Morisset
St-Valier	Achille Corriveau
BERTHIER.	
Berthier	Joseph Allard
Berthierville	Jos. D. Parent, Insp.
Lanoraie	Arthur Ferland
	Wilfrid Boisvert
St-Barthélemy	Louis Morand
	Arthur St-Pierre
	F. X. Mayer
St-Cuthbert	Vve Ant. Robert
	Isaac Grégoire
St-Damien de Brandon	Ringuette & Charbonneau
	Camille Mondor
	Hil. Gravel
St-Gabriel	Albert Desrosiers
	C. A. Champagne
	Norbert Leblanc & Frères
St-Michel des Saints	Léandre Ménard
St-Norbert	Joseph Ayotte
	David Fréchette
BONAVENTURE.	
Ste-Brigitte de Maria	Frs. Xavier Allard

PARISH OR P. O. B.	NAMES.
BROME.	
Knowlton	John H. Knowlton
Laroche	Alf. Lapierre
Mansonville	Chas. Wilkins
St-Etienne de Bolton	Donat Decelles
Sutton Junction	Howard O. Wales
Vale Perkins	Dhu Birten
CHAMBLY.	
Boucherville	Emile Lemay
Chambly Bassin	J. N. Raymond
CHAMPLAIN.	
Batiscan	L. Lizée & Cie
	Zéphyrin Marchand
	L. Phi. Lacourcière
	Pierre Lapointe
Cap de la Madeleine	Xavier Lapointe
Champlain	Jos. Carpentier
Mont Carmel	Philippe Rhéault
N.-D. du Mont Carmel	Oscar Lord
Ste-Anne la Pérade	J. H. Gendron
	Jos. Godin, fils Jean
	Michel Loranger
	S. Piché & Cie
	Alfred Abel
	Donat Loranger
Ste-Geneviève	Ernest Jacob
	Auguste Trudel
St-Maurice	Frs Ducharme
	Oscar Nobert
	Antoine Laprise
St-Narcisse	Isidore Derouin
	Trefflé Trudel
	Norbert Cossette
St-Prosper	J.-B. Trudel
	Alfred Trudel
	F. X. O. Trudel
	Benoit Trudel (2)
St-Sévérin Proulxville	Trefflé Veillet
	Epiphane Mongrain
St-Stanislas	Joseph L. Jacob
	Jos. Trudel
St-Thècle	Charles Audy
St-Tite	J. A. Lambert
	Jacob & Paquin
Valmont	Cyprien Ducharme
CHARLEVOIX.	
Baie St-Paul	Joseph Fortin
	Alfred Gagnon
	Jos. Simard, fromager
	Adélard Ménard, from.
	Charles Martel
	Alprod. Côté

PARISH OR P. O. B.	NAMES.
CHARLEVOIX—*Con.*	
Baie St-Paul	Jos. Tremblay, fils de William
	Wilfrid Simard
Isles aux Coudres	Louis Perron
Les Eboulements, (Misère)	Charles Tremblay
Les Eboulements	Jos. Bouchard
Murray Bay	Jules Bradet (2)
Ste-Agnès	Frs Harvey
	Jos. Bergeron, fils de Ferd
St-Hilarion	Evariste Desmeules
	Thos Tremblay, fromager
St-Irénée	Ferdinand Gauthier
St-Placide	Gédéon Perron
St-Urbain	Charles Fortin
CHATEAUGUAY.	
Allan's Corner	Tom. Drysdale
Aubrey	D. M. Macpherson, Cheese Factory
Chateauguay	N. R. Laberge
	Alfred Deschambault
	Raphaël Reid
	Peter Macfarlane
Howick	D. M. Macpherson, Cheese Factory
	Robert Ness
	A. E. Marleau
North Georgestown	Etienne Marleau
Ormstown	A. S. Lloyd
	D. M. Macpherson, River Outarde Cheese Factory
	D. M. Macpherson, Lorne Cheese Factory
	D. M. Macpherson, Butter and Cheese Factory
	Jas. Cottingham
Riverfield	John McGregor
Rivière des Fèves	Wilfrid Lavigueur
	Louis Patenaude
Russeltown	N. Beaudin (2)
St-Chrysostome	E. Gamelin
	John Boyd
	J. P. Brown, M. P.
Ste-Martine	N. Hébert
	Joseph Gagnier
	Joseph Poirier
	Edmond Laberge
	Edouard McGowan
Ste-Philomène	F. P. Laberge
	Delphis Lacoste
	J. A. Huberdeau
	J. B. Damour
St-Urbain	Arthur Barrette
	Jos. Armand Vinette
Stockwell	Jas. McGill
	H. W. Stuart

PARISH OR P. O. B.	NAMES.

CHICOUTIMI.

Chicoutimi	Pitre Gaudreault
	J. D. Guay
	William Tremblay
	Dr L. E. Beauchamp
	François Brassard
	Richard Gagnon
	Louis Guay
	Jean Perron
	Edmond Tremblay
	Elie Fortin
	F. Paradis
	Firmin Paradis
	Félix Boily
	Arthur du Tremblay
Laterrière	Joseph Perron
	J. Arthur Gaudreault
	Alfred Tremblay
	François Brassard
St-Alphonse	Pierre Tremblay
	Dydime Bouchard
	Jos. Maltais
St-Alexis	Ernest Lavoie
St-Ambroise, Rivière à l'Ours	Louis Gaudin
Ste-Anne	Ernest Gravel
	Henry Côté
	Joseph Savard
	Louis Boucher
	Ovide Villeneuve
	Honoré Savard
St-Chs. Borromée	Odias Gauthier
St-Cyriac	Lazare Vaillancourt
St-Dominique de Jonquières	Pascal Bergeron
	Nérée Bergeron
	Chs. J. B. Fortin
	Jean Girard
	Jos. Gagnon
	Pascal Angers
	Johnny Brassard
St-Fulgence	Jos. Harvey

COMPTON.

East Clifton	Léon Routhier
	J. O. Ezéchias Lussier
	Wilfrid Viens
	E. S. Lussier
La Patrie	Samuel Gobeil
Paquetteville	Ludger Lazure
	Isidore Lazure
	Wilfrid Pariseault
	Albert Choquette
Robinson Bury	Louis Brodeur.
St-Malo	Alvaresse Aubé.
Waterville	D. S. Davignon.

PARISH OR P. O. B.	NAMES.

DEUX-MONTAGNES.

Belle-Rivière	Wm. J. Brown.
Oka	Dom. Antoine, abbé.
	G. Boron, (professeur).
St-Augustin	Médéric Rochon.
	F. P. Riches.
St-Benoit	Arthur Rochon.
St-Canut	Napoléon Huot.
St-Placide	Napoléon Dubreuil.
	Frédéric Dubreuil.
	Adélard Lavigne.

DORCHESTER.

St-Bernard	C. Z. Béliveau.
St-Edouard, Frampton	Anselme Lacasse.
	William Free.
Ste-Hénédine	Clovis Lemay.
	Gabriel Dumont.
	Damase Bédard.
	Jules N. Paquet.
Ste-Marguerite	Joseph Maure.
St-Odilon de Cranbourne	Linière Maheux.

DRUMMOND.

Drummondville	Oct. Farly, beurre, from.
Kingsey French Village	Henry Painchaud.
	Lefebvre & Taché
L'Avenir	Emmanuel Boisvert.
St-Bonaventure	Salluste Pelletier.
St-Cyrille de Wendover	Arthur Neveu.
	Emile Paquette.
St-Germain de Grantham	Olivier Lemaire.
	J. Hermas Leclair.
St-Guillaume	J. Bte Vigneau.
South Durham	John O. Griffith.
	A. J. Hyde.
	F. Préfontaine.
	Rvd. Isid. Béland.
	Alfred Miller.
Sydenham Place, Kindsey P. O	Daniel Towns.
Wickham West	Joseph Demers.

HOCHELAGA.

N.-D. de Grâce	B. Télesphore Descarries
Pointe-aux-Trembles	G. A. Larue M. D.
	Paul Brisset.

HUNTINGDON.

Anderson's Corner	Frank Herns.
Athelstan	J. A. McDonald.
Cazaville	Jas Irwin (2).
Covey Hill	Alf. H. Pople Edwards.
	Robert Cameron Whyte.

PARISH OR P. O. B.	NAMES.
HUNTINGDON—*Con.*	
Dewitville	D. A. Macpherson.
	A. Muir, jr.
Dundee	D. M. Macpherson, Dundee Cheese Factory.
	D. M. Macpherson, Bannon Cheese Factory.
Frontier	Thos. Shatwell.
Helena	D. M. Macpherson, Walkers Cheese Factory.
	Henry Hughes.
Hemmingford	Jos Fournier.
	I. Boyes.
Herdman	George Loomis.
	A. W. Millar.
	Richard Boyd.
	Wilbert McClaren.
Huntingdon	D. M. Macpherson, Clyde Corner Cheese Factory.
	D. M. Macpherson, Huntingdon, Ch.&But.Fy.
	W. H. Walker.
	Archie Smith.
Kelso	John Smaill Bros.
Kilbain	D. M. Macpherson, Lees Corner Cheese Factory.
New Erin	R. S. Feeny.
Port Lewis	D. M. Macpherson, Port Lewis Cheese Factory.
Powerscourt	J. A. Plamondon.
Rockburn	Oliver & Farquar.
St-Agnès de Dundee	D. M. Macpherson, St-Agnès Cheese Factory.
Ste-Barbe	A. Archambault.
IBERVILLE.	
Sabrevois	Féodor F. Meunier.
	A. J. Monat.
	S J. Roy (4).
St-Alexandre	A. Labrecque.
Ste-Brigide	Osias Archambault, fro.
	Henry Archambault.
St-Grégoire	Damina Bernard.
St-Grégoire, Vers'illes P.O	Grégoire Charbonneau.
St-Johns	Guertin & Roy.
St-Sébastien	Pierre Brault.
Stottsville	E. Langevin.
Versailles	F. Ravenelle.
JACQUES-CARTIER.	
Ste-Anne de Bellevue	C. Vallée.
JOLIETTE.	
Joliette	J. B. A. Richard.
	Emile Riopel.
St-Alphonse	Georges Trudeau.
	Alfred Préville.

PARISH OR P. O. B.	NAMES.
JOLIETTE—*Con.*	
St-Ambroise de Kildare	Ethier & Laporte.
Ste-Béatrix	A. Laporte.
	Jos Laurent.
	Calixte Ayotte.
St-Cléophas	Auguste Boucher.
St-Côme	Labine & Lacasse.
Ste-Elizabeth	P. L. Gadoury & Cie.
Ste-Emélie de l'Energie	Moïse Beaulieu.
	Onés. Beaudry.
	Joseph Coutu.
	Jos. Desroches.
St-Félix de Valois	George Asselin.
	Hormidas Ducharme
	Noé Gravel.
	Eugène Boucher (2)
St-Jean de Matha	Joseph Clermont
	Georges Clermont
	Jos. Breault
	Cherrier Roberge (2)
	Tancrède St-Georges
	Anselme Asselin
	Adolphe Beaudry
	Louis Marcil
St-Thomas	Ephrem Dion
KAMOURASKA.	
Kamouraska	Narcisse Labrie
St-Denis	J. C. Chapais
	François Gagnon
St-Germain	Ls Alfred Lévesque
LAC ST JEAN.	
Chambord	Octave Lefrançois
Hébertville	Albert Tremblay
	J. Elisée Hudon
Normandin	J. B. Carbonneau
	Pierre Boulet
	Alphonse Poirier
Roberval	Rvd M. Lizotte
	B. A. Scott
	L. E. Otis
St-Cœur de Marie	Robert Lemay
St-Gédéon	Jos. Girard, M. P. P.
St-Jérôme	Jos. Gagnon
	Charles Simard
	J. B. Bergeron
	Joseph Baillargeon
St-Prime	Adélard Perron
LAPRAIRIE.	
St-Constant	Adélard Laplante
St-Isidore	J. R. Pagé
	Hormidas Philie

PARISH OR P. O. B.	NAMES.

L'ASSOMPTION.

L'Assomption	Stanislas Coyteux
	Philippe Pépin
	Joseph Parthenais
	Rve J. B. Jobin
	Frs Ern. Dubé
	Fran. Archambault
	Rvd D. Laporte, Ptre
	R. Villeneuve
	Dr F. Longpré
L'Epiphanie	Joseph Morand
Repentigny	Thouin & Lord
St-Henry Mascouche	Alphonse Soucisse
St-Lin	Brien & Gauthier
	J. P. Archambault
	E. Desmarais
St-Paul l'Hermite	Samuel Chagnon
	Philias Léveillé
	Rvd Geo. Lesage
St-Roch l'Achigan	Médéric St-André
St-Sulpice	J. A Chicoine
	Zotique Perreault
	Freddy Robillard

LAVAL.

St-François de Sales	Delvica Adam
St-Martin	J. L. Allard
Ste-Rose	J. Ferdinand Cossette
	J. G. Héroux
St-Vincent de Paul	C. E. Paré

LÉVIS.

St-Etienne de Lauzon	Tétu P. O., Samuel Gendron
St-Lambert	Georges Couture
St-Nicolas	Alphonse Filteau

L'ISLET.

L'Islet	Amédée Gaudreault
	Ferdinand Thibault
St-Pamphile	F. X. Potvin
St-Roch des Aulnaies	Jos. Emile Pelletier
	Jos. Marie Chouinard
Trois Saumons	J. A. Talbot

LOTBINIÈRE.

Lotbinière	Honorius Auger
	Joseph Beaudet
	Léger Pépin
	Henry Pérusse
	Delphis Hamel
	Philias Desrochers
	Elie Groleau
Parisville	Francis Hamel
Rivière Boisclair	Onésime Ouellette

PARISH OR P. O. B.	NAMES.

LOTBINIÈRE—*Con.*

St-Agapit	Benjamin Bergeron
	J. N. Allard
	Francis Roger
	Edmond Olivier
	Edmond Lord
	Georges Marquis
	Georges Olivier
Ste-Agathe	J. O. Boulanger
	John Blais
St-Antoine de Tilly	Guillaume Laroche
	Côté & Laroche
St-Appollinaire	Ferdinand Fortier
Ste-Emilie	Evariste Lauzé
	Jos. Jés. Beaudet
St-Flavien	Louis Bibeau
St-Jean des Chaillons	Joseph Audet
	Alfred Barabé
	Joseph Dubuc
St-Louis	Philias Laliberté
St-Narcisse	D. Kirouac
St-Patrick	Edmond Olivier
	Benjamin Filteau
Ste-Philomène de Fortierville	Laliberté et Laquerre
St-Sylvestre	Payen & Bisson

MASKINONGÉ.

Louiseville	Arthur Milot
	L. A. Paquin
Maskinongé	Théophile Sicard
St-Justin	Pierre Baril
	P. O. Coulombe
	Arthur Fournier
	Rvd M. D. Gérin.
St-Léon	L. Milot.

MATANE.

Causapscal	Zoel Boudreault
Méchins	George Eugène Verreault
	Arthur St-Pierre.
Ste-Félicité	Joseph Trembiay
	Herménégilde Gagnon.

MÉGANTIC.

Lyster, Ste-Anastasie, Nelson P. O.	Lucien Lemay.
S.-C. de Marie	J. O. Hébert.
St-Ferdinand d'Halifax	Louis Gilbert.
Ste-Julie, Somerset	Honoré Roy.
Ste-Sophie	J. A. Lenseigne.
Somerset, Cie de Somerset	M. Johnny Vallée.

MISSISQUOI.

Farnham	G. C. Poulin.
N.-D. de Stanbridge	Philippe O. St-Denis.
Stanbridge Station	P. Noel Ménard.
West-Farnham	Amédée Charland.

PARISH OR P. O. B.	NAMES.
MONTCALM.	
Rawdon	Richard Parkinson.
St-Alexis	Ernest Liard.
	Octave Magnan.
St-Calixte, Kilkenny	Ernest Lauzé.
	Ferd. Thinel.
St-Esprit	Raymond Lesage.
St-Jacques l'Achigan	Athanase Desrochers.
	Clément Laviolette.
	J. N. Marion.
Ste-Marie Salomé	L. B. Fontaine.
	J. E. Gaudet.
MONTMAGNY.	
Cap St-Ignace	G. S. Dugal.
Isle-aux-Grues	Charles Paul Roy.
	Joseph A. Roy.
MONTMORENCY.	
Château Richer	Louis Verrault.
Isle-aux-Réaux, St-François P. O.	Narcisse Roberge.
L'Ange Gardien	Ed. A. Barnard.
St-Pierre, Isle d'Orléans	F. X. Côté.
	Edm. Roberge.
	Hono. Roberge..
MONTRÉAL.	
241 rue St-Paul	Chs Langlois.
333 rue des Commissaires	J. A. Vaillancourt.
65 William St	F. A. Dorion.
55 William St	Duckett Hodge & Cie.
2 et 4 Foundling St	N. E. Clément.
c/o Ayer&Cie, McGill St.	J. H. Scott.
71 William St	F. H. Ryan.
33 William St	James Murray.
65 William St	F. Cypihot.
12 Port St.	James Sutherland.
Box 845	H. G. Nivin.
534 rue St-Denis	Raoul Duclos.
281a rue Sanguinet	J. A. Lahaie.
1674 rue Notre-Dame	Victor Guertin.
NAPIERVILLE.	
Napierville	Théophile Fortin (3).
St-Rémi	Charles Huguet-Latour..
NICOLET.	
Bécancourt	Gaspard Côté.
Nicolet	Nap. Desfossés
	J. Lucien Doré.
	Abraham Beaulac.
	Frs. Manceau.
	Philippe Brassard.
	Wilfrid Camirand.
	Sévère Gaudreault.
	Edmond Houle.
Ste Brigitte	Léon Paquette.
	H. Houle.

PARISH OR P. O. B.	NAMES.
NICOLET—*Con.*	
St-Célestin	Philémon Duguay.
Ste-Eulalie	Dolphis Bergeron.
Ste-Gertrude	Arsène Houle.
	Noé Morissette.
	Henry Piché.
St-Grégoire	Hubert Dufresne.
St-Léonard d'Ashton	Hyacinthe Cloutier.
	Edouard Desfossés.
	Joseph Hébert.
Ste-Monique	Charles Milot (5).
	B. A. Pothier.
	J. B. Beauchemin (2).
	Félix Descoteaux.
OTTAWA.	
Aylmer	Jos Alex. Noël.
Buckingham	Thos Ross & Sons, Monaléa No 15.
Hollands Mills	Thos Ross & Sons, Monaléa No 18.
Little Rideau	Thos Ross & Sons, Monaléa No 1.
Mayo	Thos Ross & Sons, Monaléa No 21.
Montpellier	Louis Montpellier.
Montebello	Ferdinand Huneault.
Papineauville	Henry Bourassa M. P.
	T. Bonhomme.
Ponsonby, Boileau P. O.	Joseph O. Danis.
Silver Creek	Thos Ross & Sons, Monaléa No 20.
Thurso	Louis Sauvé.
PORTNEUF.	
Allan's Mills	Eugène Gauthier.
Cap Santé	Gabriel Hamel. (3).
Deschambault	Arthur Morissette.
	Uldéric Benoît.
	Fortunat Naud.
	F. X. Paquin.
Ecureuils	Hubert Auger.
Grondines	Louis Archambault (2)
Lachevrotière	J. A. Guertin
	Gédéon Laganière
	Oscar Naud
N.-D. des Anges	Rvd M. S. Garon
	J. Philippe Moreau
Poiré P. O	Narcisse Naud
	Albert Naud
St-Alban	Louis Carreau
	Hubert Perron
	Albert Naud
	John Savard
St-Bazile	Richard Morissette
St-Casimir	Roch Massicotte
	Rivard & Lacourcière
	Germain & Tessier
	Jos. Perron

PARISH OR P. O. B.	NAMES.
PORTNEUF—*Con.*	
St-Gilbert	Hubert Paquin
St-Raymond	J. Arm. Plamondon
	Frs-Xavier Faveur
St-Ubalde	Maxime Hardy
QUEBEC (County).	
St-Ambroise, Jeune Lorette	Arhur Blondeau
St-Félix du Cap Rouge	Hervey Routhier
Ste-Foye	N. Garneau, M. P. P.
QUEBEC (Town).	
Bloc Chouinard, Basse Ville	Saül Côté
RICHELIEU.	
St-Aimé	Narcisse Léveillé
	Louis Lalancette
	Gilbert Mathieu
St-Joseph	Joseph St-Martin
St-Louis	Ant. St-Martin (3)
	J. B. Laplante
	Norbert Laplante
St-Marcel	Rvd M. J. Beaudry
	J. A. Courchesne
	Wilfrid Plamondon
	Odilon Vadeboncœur
St-Ours	Amédée Bonier
	François Robillard
	Eusèbe St-Germain
	Aimé Robillard
	P. A. Massé
	L. H. Morin
	Magloire Houle
	Pierre Lachambre
	Pierre St-Germain
St-Roch	Donat Collette
	Alexis Collette
Ste-Victoire	Hercule Paul Hus
	Hormidas Plante & Cie
Sorel	Ald. D. de Grandpré
	Narcisse Cournoyer
	Dr R. Latraverse
	Hercule Paul Hus & Ph. Duhamel
	. J. C. Wurtele, avocat
RICHMOND.	
Asbestos Mines	Adolphe Parenteau
	Edouard Plourde
Castlebar	J. E. Beauchemin
Danville	Louis Lafrance
	Jos. Desfossés
	J. A. McCallum (2)

PARISH OR P. O. B.	NAMES.
RICHMOND—*Con.*	
Danville	James Hall
	Wm Flaming
Kingsbury	John Watson
Lorne	A. Pard
Melboro	John Munroe
Melbourne Ridge	James Dunbar
	Miss Celina Bushell
	Wm D. Stalker (2)
Flodden	Jas. Austin Stalker
Richmond	Alex Stuart
	Miss Louise D. A. Jefferey
	Miss U. O. Thompson
St-Cyr	William Houle
St-F.-X. de Brompton	Pierre Labbé
St-Georges de Windsor	A. Marcotte
Slatington	J. S. Mably
Upper Melbourne	H. W. Armstrong
	A. C. McKay
RIMOUSKI.	
Rimouski	Etienne Côté, beurrier
St-Fabien	J. Emile Rioux
St-Simon	A. A. Nicole
ROUVILLE.	
Abbotsford	Adélard Carignan
	Napoléon Legros
	Jos. Martin
L'Ange-Gardien	Elie Bourbeau
	Marc MacDuff
	Joseph Lacoste
Magenta	Cléophas Archambault
Marieville	Jos. Archambault
	H. E. Poulin
Pauline	J. P. Rocheleau
Richelieu	J. Alexandre Aird
Rougemont Station	C. N. Frégeau
Ste-Angèle Monnoir	Joseph Fournier
St-Césaire	Samuel Aubin
	Henry Normandin
	Wilf. Bourbeau
	N. L. Duhaime
	C. Leclair
	X. Lemay
St-Jean-Baptiste	Louis Remi
	Jos. Roy
	Fromagerie Lambert (L. F. Robert)
	Alfred Ostiguy
	Joseph Robert
St-Marie Monnoir	Félix Bessette (fils de Pierre)
	Aimé Lemaire
St-Paul d'Abbottsford	Moïse Côté

PARISH OR P. O. B.
L'Acadie
Henrysburg Laco
Lacolle
St Valentin
S
La Présentation
St-Charles
St-Damase
St-Denis
St-Hyacinthe
St-Judes
Ste-Madeleine
S
Pointe du Lac
St-Barnabé
St-Sévère
Shawenegan
Yamachiche
S
Bonsecours
Dalling Ely
Egypte
Frost Village
Granby
Lawrenceville
Mawcook
Milton East
North Stukely

PARISH OR P. O. B.	NAMES.
ST-JEAN.	
L'Acadie	Jules Ménard
Henrysburg Lacolle	J. W. Stuart
Lacolle	Pierre Bouchard
	Beurrerie de Lacolle No 2 c/o, L. A. Corbière.
	Cyrille Boudreau.
St Valentin	Pierre Bouchard.
	J. G. Bouchard.
ST-HYACINTHE.	
La Présentation	M. A. Pichó.
	Laurent Dussault.
St-Charles.	Etienne Migneault.
St-Damase	Fromagerie de Corbin.
	Fromagerie du Pont.
	Francis Racicot.
St-Denis	Louis Phaneuf.
St-Hyacinthe	Rvd M. C. A. Beaudry.
	Emile Castel.
	J. de L. Taché.
	Hector Bélanger.
	Hormisdas Gadbois.
	Emile Desjardins.
	L. A. Gendron.
St-Judes	Stanislas Mathieu.
	Amédée Lacroix.
	Xavier Larivière.
	Pierre Comeau.
	Israel Dufault.
Ste-Madeleine	Louis Chabot, fromager.
	Eusèbe Gaudreault.
ST-MAURICE.	
Pointe du Lac	Olivier Duplessis.
St-Barnabé	Pierre Corriveau.
	Edouard Gadbois.
St-Sévère	Victor Milot.
Shawenegan	Télesphore Pellerin.
Yamachiche	J. Fortunat Côté.
	Hercule Bourassa.
SHEFFORD.	
Bonsecours	Hormisdas Laplante.
	Alexandre Gouin.
Dalling Ely	Thomas Rahill.
	M. Fleurant.
Egypte	D. Chaput.
Frost Village	James Hamilton.
Granby	Edmond Salois.
	Philippe Vadnais.
	Philias Maynard.
	E. W. Payne.
Lawrenceville	Emile M. Dion.
Mawcook	J. H. Rocheleau.
Milton East	Frédéric Maynard.
	Azarie Côté.
North Stukely	Nazaire St-François.
Nth Stukely, Bonsecours	Hormisdas Simonneau.
Racine	Gilbert Stalker.
	Damase Choinière.
Rochelle	Maxime Archambault.
	Félix Langevin.
Roxton East	Joseph Brun.
Roxton Falls	Edéas Larocque.
	Louis Brazeau.
	F. A. Dorion.
Roxton Pond	Isidore St-Pierre.
St-Alphonse de Granby	Pierre Allard.
	Wilf. Dion.
Ste-Anne, Stukely	Jos Morin.
	Ls. Lozeau.
St-Joachim	Napoléon Côté.
St-Valérien	André Brasseur.
	J. B. Dépôt.
	Maxime Robert.
	Alphéri Touchette.
	Napoléon Moreau.
	Arthur Marsan.
	Rvd F. P. Côté, ptre.
	Herménégile Robert.
	H. Paquette.
Savage Mills	Savage & Purdy.
	P. H. McIntosh.
Shefford Mountain	Edward Doonan.
South Ely	Asa. L. Darby.
South Granby	A. Fossey & F. A. Dorion.
South Stukely	W. S. Purdy.
Valcourt Ely	Joseph Véroneau (2).
	Hypolyte Bombardier.
	Joseph Racicot.
Warden	L. E. Richardson.
	Joseph Dandelin.
Waterloo	Hormisdas Boulé.
	J. A. Bourbeau.
	James Goddard.
	C. H. Parmelee M.P.
West Ely	Nelson Moffat.
West Shefford	W. Murray.
	Z. S. Lawrence.
SHERBROOKE.	
Sherbrooke.	Rvd. F. Venant Charest.
SOULANGES.	
Coteau Station	Jos Flavien Montpetit.
	Emeric Sauvé.
Rivière Beaudette	Louis Méthot.
Pont Château	J. A. Bourbonnais.
St-Clet	Fabien Chatelois.
St-Polycarpe	J. Hector L. Leclair.
	Gabriel Desrochers.
	J. A. Pigeon.
	Nazaire Chevrier.
St-Télesphore	J. H. Gareau.
	Louis Charlebois.
St-Zotique	Joseph Prieur.

PARISH OR P. O. B.	NAMES.
STANSTEAD.	
Baldwin Mills	The Baldwin Condensed Milk.
Coaticook	Ernest Rainville.
	Auguste Gérin.
East Hatley	C. E. Standish.
	Tom Ride.
Marlington	Harley N. Holbrook
Oliver	Mrs. Sarah A. Rexford
TÉMISCOUATA.	
Fraserville Station	Archie Fraser
L'Isle Verte	Alfred A Paradis
	Préfontaine & Frère
Old Lake Road	F. Flo Soucy
St-Arsène	J. A. Saindon
St-Eloi	G. Godbout
St-Epiphane	François Patoine
St-Jean de Dieu	J. O. Massé
Trois Pistoles	S. E Côté & Cie
TERREBONNE.	
La Plaine	Théodule Corbeil
New Glasgow	Georges Bennett
	Amédée Désormeaux
Rivière Gagnon	Thos Ross & Sons No 7
Ste-Adèle	Dr W. Grignon
Ste-Agathe des Monts	Jules Désormeaux
Ste-Anne des Plaines	Siméon Giguère
St-Jovite	Benjamin St-Amour
Ste-Marguerite du Lac Masson	Rvd M. A. G. Moreau
St-Sauveur des Monts	Grégoire Bélanger
Ste-Sophie	E. Gaudet
Ste-Thérèse	Antoine Desjardins
	Rvd H. Cousineau
	J. D. Leclair
	Rvd J. A. Vaillancourt
	Henry Forget
Terrebonne	Henry Moody
	Dr V. T. Daubigny
THREE-RIVERS.	
Banlieue des Trois-Rivières	Hormidas Duval
Trois-Rivières	J. A. Milot
VAUDREUIL.	
Beauvoir	A. O. Ranger
Grahan	Trefflé Pilon
Mont Oscar	Napoléon Quesnel
Pointe Fortune	Thos Ross & Sons, Monaléa No 4
Rigaud	J. E. Chevrier (2)
Ste-Justine de Newton	Henry Charlebois
	Théop. Doucet

PARISH OR P. O. B.	NAMES.
VAUDREUIL—*Con.*	
St-Lazare	Oscar Denis
Ste-Marthe	Peter Monahan
	Rosario Séguin
	Union Valley Cheese Fy. (Michaël McManus)
St-Rédempteur	Georges Valois
Vaudreuil	Amédée Castonguay
	Elzéar Brasseur
	J. B. Besner
VERCHÈRES.	
St-Antoine	Ovila Bonin
	Donat Hébert
Ste-Julie	Alexis Chicoine, fils
	Rvd J. C. Daignault
St-Marc	Alexis Chicoine
	Horm. Handfield
	Phydime Desmarais
Ste-Théodosie	Vital Larose
Verchères	Jos. Dansereau, fils de Cami.
	Syndicat de Verchères, (Jos. H. Pigeon, sec.)
YAMASKA.	
Baie du Febvre	J. T. Bélisle
	Uldéric Lévesque
	Nazaire Lemire
	J. Louis Lemire
	Zéphirin Duguay
	J. N. Duguay
	Ludger Bélisle
	Michel Lemay
	Napoléon Danneau
Chatillon	Ovide Lépine
N.-D. de Pierreville	Ida Niquette
St-David	Napoléon Richard
	Albéric Melançon
St-Elphège	Dolp. Coll
	Roméo Hamel
	Siméon Paquette
	Adolphe Parent
	Ludger Parent
	William Parent
St-François du Lac	Edouard Giguère
	J. O. Duhaime
	Alma Léveilllé
	Elie Duhaime
St-Pie Deguire	Edmond Coll
St-Thomas de Pierreville	Adélard Boisvert
	Joseph Elie Boivin
St-Zéphirin	Emile Lahaie
	Herman Lefebvre
	M. Laprise
	Elisée Parent
	Alfred Boisvert

PARISH OR P. O. B.
Y
Yamaska
Garthby Station
Ham Nord
Lake Weedon
Marbleton
St-Camille
Weedon Station
Wotton
Elb Mills
Glensanfield
Guelph—O. A. C.

PARISH OR P. O. B.	NAMES.
YAMASKA—*Con.*	
Yamaska	Calixte Robidoux
	Narcisse Parenteau
	Dolphis Parent
	Joseph Parent
WOLFE.	
Garthby Station	Adjutor Lepage
Ham Nord	Georges Cloutier
	David Cloutier
	Achille Richer
Lake Weedon	Ed. Laliberté
Marbleton	Ephrem Lizée
St-Camille	Pierre Caron
	Elzéar Després
Weedon Station	Pierre J. Després
	J. L. Painchaud
Wotton	Zacharie Bilodeau
	Stanislas Ouellette
	Eugène Paquin
ONTARIO.	
Elb Mills	Hiram Bates.
Glensanfield	Euclide Lauzon.
Guelph—O. A. C	Charles Mortureux.

PARISH OR P. O. B.	NAMES.
ONTARIO—*Con*	
Ottawa	Honorable S. A. Fisher.
St-Albert	Alph. Laforêt dit Lebrun.
Ste-Anne, Prescott	Joseph Blais.
	Laurent Strasbourg.
St-Eugène	Procule Dicaire.
SASKATCHEWAN.	
St-Louis de Langevin via Duck Lake	Paul Blondeau.
ETATS-UNIS.	
Lowelltown (Maine)	Thomas Binette
Champlain (N. Y.)	J. B. Bédard.
Gardiner City (Or.)	J. A. Janelle.
Norton Mills (Vt.)	J. G. Gendron.
FRANCE.	
Paris, 88 rue d'Assas	A. Billard.
Paris, 18 rue Clauzel.	R. Lézé.
Ouilly le Vicomte (Calvados)	C. Morice.
Lisieux (Calvados)	Edmond Groult.
Mende (Lozère)	E. Rigaux, prof. of agric.

RECAPITULATION AND TOTALS BY COUNTY.

Argenteuil	18	Kamouraska	4	Richmond	26
Arthabaska	36	Lac St-Jean	16	Rimouski	3
Bagot	35	Laprairie	3	Rouville	27
Beauce	56	L'Assomption	22	St-Hyacinthe	21
Beauharnois	18	Laval	5	St-Jean	7
Bellechasse	4	Lévis	3	St-Maurice	7
Berthier	18	L'Islet	6	Shefford	58
Bonaventure	1	Lotbinière	33	Sherbrooke	1
Brome	6	Maskinongé	8	Soulanges	12
Chambly	2	Matane	5	Stanstead	7
Champlain	35	Mégantic	6	Témiscouata	9
Charlevoix	20	Missisquoi	4	Terrebonne	18
Châteauguay	36	Montcalm	11	Trois-Rivières	2
Chicoutimi	39	Montmagny	3	Vaudreuil	16
Compton	12	Montmorency	6	Verchères	10
Deux-Montagnes	10	Montreal	14	Wolfe	13
Dorchester	9	Napierville	4	Yamaska	35
Drummond	17	Nicolet	29	Ontario	8
Hochelaga	3	Ottawa	12	Nouveau-Brunswick	0
Huntingdon	31	Pontiac	0	Saskatchewan	1
Iberville	16	Portneuf	31	Etats-Unis	4
Jacques-Cartier	1	Quebec	4	France	5
Joliette	30	Richelieu	31		
					1003

THE REPORT "IN EXTENSO"

OF THE

SEVENTEENTH ANNUAL CONVENTION

OF THE

DAIRYMEN'S ASSOCIATION

OF THE PROVINCE OF QUEBEC,

HELD IN VALLEYFIELD, THE 6TH AND 7TH OF DECEMBER, 1898.

THE SESSION OF TUESDAY MORNING, DECEMBER 6TH.

Mr. J. D. Guay in the Chair.

The first session of the Convention was opened at 10 a.m.; in the absence of the President, Mr. Milton McDonald, M.P.P., and of the Vice-President, M. H. Bourassa, M.P., Mr. J. D. Guay, one of the directors, was appointed chairman *pro tem.*

A committee was then appointed to examine the samples of butter made by Mr. J. D. Leclair, manager of the St. Hyacinthe Dairy School, from pasteurised cream. The committee was composed of Messrs. J. H. Scott, J. A. Vaillancourt, N. E. Clément, J. de L. Taché, Sam. Chagnon, Alex. Chicoine, and Chas. Préfontaine.

REPORT OF MR. ÉLIE BOURBEAU,

Inspector-General of Syndicates.

To the members of the Board of Directors of the

Dairymen's Association of the Province of Quebec.

Gentlemen,

I have the honour to submit you my third annual report as Inspector-General of the Syndicates of creameries and cheeseries of the province of Quebec. I began my tour through the syndicates towards the end of May, and finished my visits on the 29th of October.

Two reasons led me to change my manner of inspection this year; I used to make my visits to the factories in company with the inspector of the syndicate I was inspecting; this year, I visited them alone. Being obliged, in previous years, to forewarn the inspectors that I would meet them at such and such a place, at such and such an hour, I found that the inspectors and I, occasionally, lost a good deal of time and had to travel too quickly. In the second place, I thought that I might thus more certainly find out how the inspectors were discharging the duties imposed upon them by the rules of the Association.

I did my best to discover, in my tour, what were the principal causes of the defects from which our dairy trade is suffering, defects, I may say in passing, that are pretty numerous.

As Mr. Plamondon, in his report, will chiefly advert to the faults in the methods of making, I, for my part, shall limit myself to a recounting of the defects arising from other causes than bad making, especially from the bad smell and bad texture of the cheese, as far as they arise from causes unconnected with the making, among which I will here point out the bad milk furnished by the patrons, badly constructed factories, and their careless management.

As to bad milk, I will only say a word, as the question has been treated fully by the Association in its bulletin, as well as by the dairy committee, and the lecturers. Their labors have indubitably borne fruit; an improvement is visible; but it seems to me it is slow in its steps, and the patrons seem to me to have a lamentable tendency to relax their efforts and to take less care of their milk, as soon as the price of milk falls a little, under the pretext that its manufacture is no longer remunerative. But it is precisely when prices are low that our efforts should be redoubled, in order that our goods be preferred by both purchaser and consumer. On the other hand, if the farmer will not take care of his milk, how can he expect the proprietors to supply good factories and the other improvements necessary to the making of a superior class of goods.

I have already, in previous reports, had to draw the attention of the Association to the defective construction of some of our cheeseries, and I now again insist upon this point, for the factory-building is the most important of all things and merits our earnest attention. I have already observed that no cheesery can be considered first-class unless the building be perfectly air-tight, and the ripening-room be thoroughly ventilated and so arranged that a temperature of from 60° to 65° F. can be easily maintained therein, both in summer, in spring and in the fall, so that the cheese may be ripened in those rooms without being dried up. The ripening-room must be easy to wash out, well lighted, well ventilated, provided with good drainage, so that the underneath and the surroundings of the building be free from the fault of emitting bad smells.

Factories that are not equipped with such facilities as the above are not perfect, and we know, unfortunately, that they are the greater number. The importance of the proper construction of the ripening-room is nowadays acknowledged by all to be very great; now, it is without doubt, in this point that our cheeseries are most defective. To convince you of this, it will be

enough to give you the results of a slight enquiry made in the syndicated portions by our inspectors. In their visits, at 9. a. m., in August, they took the temperature of the ripening-rooms; some they found as high as 90° F.; the average was 70°.8: and, had they had an opportunity of taking the temperature at 3 p.m., it would have probably been 75° to 80°! This high temperature is probably the cause of so much bad smelling, fissured (*ouvert*) cheese. Under such conditions, the best cheese will lose some of its value, let alone the loss of weight. I have seen factories in which the cheese had lost so much butter-fat that the floor of the ripening-room was almost covered with it; of course, in such cases, the loss must be considerable. Now, who suffers by this loss? Generally the maker, who is responsible for the good quality of his cheese. And yet, it very often happens that the cheese was well made. But if the loss as regards quality falls unjustly on the maker, the farmer has to bear the loss on the weight, and the far greater loss from the damaged reputation of our products. I repeat that which I have said before: We must do our best to improve all that is defective in our cheese manufacture if we mean to retain our position in the market. Our competitors are hard at work to supplant us. There are certain States in the Union, that a few years ago made no cheese, that are now erecting expensive stations to study experimentally the proper mode of ripening cheese. This is a certain sign that we shall have in them very formidable rivals; it is well to know this, and the better if we are going to prepare our defences against them.

Another origin of great defects is the faulty drainage, or rather the absence of drainage, in and around our factories. Although this defect is not as general as bad ripening-rooms, we meet with it too often, and I really think that in some cases a visit from an official of the Health Committee would do more good than our limited powers allow us to do. Unluckily, I found, in the fine country round Beauharnois, some most unhealthy cheeseries, in which the whey and the drainage of the washing-ups remained permanently in the ground under the factory and its surroundings. This is another reason for the existence of badly flavoured cheese, for which the maker, unless he is also the proprietor, is by no means responsible.

I shall say no more on the subject, as I propose to recur to it to-morrow when testing milk by the curd.

The whole respectfully submitted,

E. BOURBEAU.

REPORT OF MR. J. A. PLAMONDON,

Assistant Inspector-General of Syndicates.

To the Directors of the

Dairymen's Association of the Province of Quebec.

Mr. Chairman and Gentlemen,

I have the honor to submit to you my third report as Assistant Inspector-General of the Dairymen's Association.

Before beginning my regular tour of inspection, I organised a syndicate at Joliette, whence I started on my usual round of visits. At first, in almost every syndicate inspected, I gave a lecture on general dairying, especially on the care to be taken of the milk, the need of keeping the cans clean, of emptying out the whey from them as soon as possible, and of thoroughly cleansing them. I also blamed most emphatically all ill-made and badly-placed whey-vats, maintaining that they ought to be taken out from under the buildings, and set up in a place where they could be easily cleansed, recommending the patrons to watch the maker and to compel him to keep these vats clean. At my second visit, I was glad to see that my advice had been followed, for in several factories I found that the vats had been changed from their old places, and were as clean as they could be. And it was not without need that we looked after these defects, for I found more "off-flavour" cheese this year than ever I found before.

During the summer, I visited 11 syndicates twice, and 11 once; this made in all 33 visits to syndicates. I inspected 305 cheeseries and 48 creameries; I examined 23,791 cheeses, which I classified as follows:

	Number of Syndicates visited.	Number of Cheeseries visited.	Number of Cheeses examined.	Number of Cheeseries in which all the cheese was 1st class.	Total number of 1st class Cheeses.	Aroma.	Body.	Texture.	Colour.	Appearance.	Factories and outbuildings, drains, etc.	Outside and inside material and fittings.	General condition of the factory.	Method of working.	Number of creameries visited.	Classification of the butter.	State of the Creamery.	Outbuildings.
1st Class.....	33	305	23791	36	1964	14313	14033	10635	14536	15843	110	229	164	147	48	28	30	25
2nd "						7254	7658	11105	7113	5872	154	74	123	152		20	15	21
3rd "						260	136	87	178	112	41	2	18	6			3	2

On comparing this table with the one in my last year's report, I find that I met with much more "off-flavour" cheese this year than then, and I think I can assign many reasons for it.

In the first place, I visited many newly syndicated factories that had never been inspected, and I was surprised to see what sort of cheese they were making there! I had no idea that such bad cheese was being made in our province. It is no wonder that ours is quoted at a lower price than the cheese of Ontario, if such stuff is sold along with our good cheese. But from my second visit to these factories, I found a great improvement.

Secondly, we still have too many makers who persist in making their cheese too soft, so as to get larger yields out of the milk, with the dishonest aim of beating their neighbours. Of course, the result is an "off-flavoured" cheese, if it is kept long enough. A well-made, firm cheese, placed on the same shelves as these, would have preserved all its aroma. I had an opportunity in many places to prove this and to point it out to the makers. If we always received good milk, there would not be so much harm in making a soft cheese; but as long as our makers have to accept badly kept milk, they will have (if they want to do so and know how) to treat it in such a way as to make, not a perfect cheese, but still a cheese much superior to those we too often see. For, in my opinion, the two chief causes of "off-flavoured" cheese are these: filmy unaerated milk on the part of the patrons; and, on the part of the maker, too much moisture in the cheese.

Thirdly, in some districts the cheese had been kept too long by far. I have seen cheese kept for 6 and 7 weeks, and even for two months, in the hope of better prices; and indeed it was sold for ¼ cent more; but the cheese was "cut" by a quarter to three-quarters of a cent as being "off-flavour," fissured or mouldy. The patrons got their ¼ cent, but it was the poor maker who lost by it. Was it not then unfair, or at least foolish, to keep cheese in this way as a speculation. Only where there are good, lofty ripening-rooms should this be done. Attend rather to the advice of Mr. Alfred Clements, the great importer of cheese at Glasgow (Scotland), to the farmers of the Townships, given last year at Cowansville; did he not strongly recommend them to sell their cheese as soon as made, rather than keep it? "Supply and demand," said he, "always regulate the price of cheese as of every other product. If you take it into your head to stand out for a certain price, you may at first gain by it, but sooner or later you will suffer for it. Gambling and speculation on dairy-goods are not advisable; they are not articles suited to speculation. They sell well when they are in the best condition, but it is never advantageous to keep them longer. It is not the same as with wheat and other long-keeping goods."

When speaking of boxes, Mr. Clements said that the eye is always the first thing you should aim at satisfying; clients are inclined to suspect badly packed goods. They are also very hard to please as regards the aroma. A pleasant flavour of the hazel-nut is what is looked for in cheese. An aged wife of a farmer had the reputation of carrying off all the prizes at the shows. Mr Clements went to see her, and asked to be allowed to see her exhibition cheese.

"I do not make any cheese for exhibition," said she; "I always try to make to-day's cheese better than the cheese of yesterday; that is all my secret." If all our makers were to try the same plan, we should not have so much inferior stuff as we have now.

But, to return to those who keep their cheese. If Mr. Clements had seen the so-called ripening-rooms in which these cheeses had been kept, I wonder what he would have thought of them. What ideas could be in the heads of those who crammed their cheese into these dens under the notion that they would keep and ripen properly in them? Small, damp, sombre rooms, where no light penetrates, except when a spare ray or two finds its way through the chinks in the partitions and floors.

You may fancy I am exaggerating, but I assure you I am speaking in sober earnest; and this leads me, at the risk of being considered over-urgent, to repeat what I have already said of the need of taking measures to induce, or rather, if necessary, to compel, makers to improve their ripening-rooms. I never was so much impressed with the necessity of these improvements as I was last season; I saw so many otherwise well made cheeses get ruined in these self-styled ripening-rooms. In one syndicate alone, 6 or 8 factories at least lost ½ cent a pound on their cheese from nothing but mildew. Nothing can preserve cheese from becoming mouldy in such holes!

But it is especially in texture that our second-rate cheese is in fault. This defect is entirely under the control of the maker; with a little care and patience, and with less hurry to get the work over early in the day, firm cheese of equal texture can be made.

Appearance, too, is far from being what it should be. At one of the competitions, where I was a judge, there were one or two cheeses that, but for the lack of a good appearance, would have won the first prize; and I saw several more that missed winning second and third prizes from the same cause.

On the whole, I do not recollect ever having seen a season so bad for cheese-making as the last. Everybody complained, saying that the milk was so hard to make work.

People say that "misfortune never comes alone," and I see that we were not the only ones to suffer last summer; for our neighbors in Ontario encountered the same disasters. (See "The Farmer's Advocate" of September 2nd). This is what that paper reports apropos of the cheese shown at the Toronto Fair:—"There were a great many cheeses shown that looked very well on their arrival, but the terribly hot weather of the first few days, joined to the impossibility of cooling the hall, made many of them pitiable to see before the cool weather of the second week made its appearance. The fatty matter ran out, the cheese cracked, opened here and there, and most of the cheeses became 'off-flavoured' (which shows how necessary it is, at shows as well as in factories, to have proper places in which to keep cheese). In the opinion of the judge, Mr. A. F. McLaren, the quality this year was far inferior to that of the exhibits of the last few years, even if the cheese had not been damaged by the hot weather during the show.

"It was remarkable that there were many cheeses that were dry, full of gassy holes, and having a bad aroma; still, the general appearance of the cheese was notably improved, and this served for an object lesson for the public who remained behind the bars."

We cannot say as much for ourselves, for we have hardly tried to improve the appearance of our cheese, and yet it is a thing that is utterly and entirely under the control of the maker. The score of some of their best lots reached 94 marks, but the general run did not exceed 85, and some fell as low as 76. Their weak points were texture and aroma; just as with us.

Apropos of the bars put up to prevent the public from intruding on the exhibits; this is an example we of the Quebec shows should follow. I saw, last year, cheeses riddled with stabs of the taster; the first comer plunged that instrument into them at his ease; and, this year, I saw cheeses from which large lumps had been taken, and butter, too, into which the public had jabbed its fingers for the purpose of tasting it. Is this not disgraceful, and enough to prevent people from exhibiting? Nobody, I am sure, likes to see his goods injured while on show.

In the same paper, I observed a passage relating to the difference of price between Canadian Cheddar and English Cheddar; this, with your leave, I will read to you.

"We are still far, as yet, from getting those higher prices that we may properly expect. The Canadian cheese-maker doubtless knows his business thoroughly, as well as his English rival, but does he do his best? We believe, generally speaking, he does, as we believe that, if the patrons and the maker have each their responsibility, the difference of quality is especially due to the fact that the Canadian cheese is ripened and taken to market in a temperature too high for the development of that fresh, delicate aroma, and that rich texture, for which the English consumer is willing to pay such high prices. Moreover, the English market is growing more and more exacting, and the dry, firm cheese that answered the demand there a few years ago, is, nowadays, completely out of the running. The ripening-room of the good old times, with its variations of temperature, may have been good enough then; but, with the different sort of cheese now required by the market, it is completely out of date.

"We have here the extremes of heat and cold, to which vicissitudes of temperature the cheese of England and Scotland is not exposed. At the last Industrial Exhibition at Toronto, the judges declared that the cheese shown did not possess, as a whole class, the improved quality that might have been reasonably expected. During the last few years, many correspondents of the 'Farmer's Advocate' have made observations on the state of the making and ripening-rooms, on the interior and exterior arrangements of the factories, in different parts of the country, and it must be confessed that many of them are entirely behind the times, and a disgrace to the dairy industry. We do not hesitate to tell the proprietors of the factories and the makers concerned, that this question is one of importance, and that, before the opening of another season, it is highly desirable that the present state of things should be improved.

"It is absolutely necessary that the temperature be controllable, and that it be kept at a much lower degree during summer than it usually is. Besides, better means of transport should be provided. During the last two seasons, under the direction of Mr. Commissioner Robertson, a system of cold store-rooms has been provided for the creameries, encouraged by a trifling grant from the Government; but, as we have previously said, and as we now repeat, the cheeseries deserve quite as much attention as the creameries."

You see that our Ontario friends have their eyes opened to the danger; we must keep ours open, too, if we do not want to "lag last."

I cannot close this already too lengthy report without mentioning the "curd-test" that we introduced last winter at the St. Hyacinthe Dairy-School, and which has been introduced, this summer, into their factories by most of our inspectors. It has rendered marvellous service in many places. Had I time and space enough, I could mention dozens of cases, in which, by its use, the origin of the trouble was located and the proper remedy applied. Still, this new affair gives the inspector a great deal of trouble, when he already has no time to spare. In some places, the inspector has to stay two days at the factory; one day to make the test, and another to show the results to the patrons, and make them observe the sort of milk and curd each of them sends in to the factory. When an inspector has 25 factories in his syndicate, it takes him a longish time to go through them all. The remedy would be for each inspector to take fewer factories and to give each of them more attention. In order to secure that, more inspectors would be required, and the more the better. I want every factory in the province to be syndicated; it is a pity I cannot show you, as I have myself seen it, the difference between a syndicated and a non-syndicated factory. You would not say then, as many now say: What is the good of the inspectors?

The whole respectfully submitted,

J. A. PLAMONDON.

DISCUSSION ON THE REPORTS OF THE INSPECTORS-GENERAL.

Mr. McGowan—In M. Bourbeau's report of last year, he expressed himself forcibly against the small factories. This year I observe that he does not mention them: I should like to know, then, if this trouble has a tendency to disappear?

M. E. Bourbeau—There may be fewer of them perhaps. But were I to repeat every year in my report the defects found in the preceding year, and which still remain, I should never have done. Although I do not speak of small factories, the evil still exists and does not seem likely to disappear, unless more pains are taken to abolish it than are taken at present.

Mr. McGowan—Can you give us a hint how to get rid of them?

M. Bourbeau—Had I known how to do so, I should not have waited till now to promulgate it. The only thing to be done, in my opinion, is to enlighten farmers as to the losses they incur by encouraging small factories. When they have learnt the extent of their losses through them, they will no longer encourage them. I hope that the committee appointed last year, and whose report appears in the programme of the convention, will have some practical remedies to offer us.

M. E. Castel—If you will permit me, I will say a word or two on this matter. A great deal of attention is being paid to the means of reducing the great numbers of our cheeseries. It would probably be difficult to do this by special legislation ; but we have already a law which might, if not reduce the number of small factories already existing, at least make the creation of more of them less easy and tend to the improvement of those now in operation. In its present shape, it is perhaps difficult to apply this law to cheeseries and creameries, but as it is intended to get it amended in the Legislature next session, it would doubtless not be difficult to make it applicable to both creameries and cheeseries. The law in question is that relating to manufactories as regards sanitation. Now, how many small factories constitute a danger not only to our dairy industry, but also to the public health. This question I laid before Dr. Lachapelle, the President of the Health Committee at Montreal. He received me very kindly and appeared to thoroughly appreciate the object of public interest pursued by the Dairymen's Association in its crusade against the small factories ; the Association has no hostile feelings against anyone ; and it is only in the public interest that it is seeking to obtain the passing of a bill to remedy the evil we complain of to-day.

Dr. Lachapelle told me that the rules of the Health Committee declare that no manufactory can be established in any municipality without the consent of the Municipal Council. Are, or are not, the creameries and cheeseries manufactories ? It is to decide this by the statutes that measures are being taken. A few years ago, it was stated at Quebec that creameries and cheeseries were not manufacturing establishments in the sense intended by the rules (*by-laws* ?) of the Health Committee ; but I think that, while recognizing the fact that they are manufactories in the full sense of the word, they might easily be made dependent on the Municipal Councils and the Board of Health.

In that case, the Municipal Councils could not give leave for the erection of one of these factories, except on the condition that the plans of drainage had been approved by the Board of Health of the province. This, it appears to me, would be a sufficient guarantee.

M. l'Abbé Côté—It is not absolutely improbable that the member who brought such a bill into the House would be stoned.

Mr. Ed. McGowan—This might be done ; why should not at least 30 signatures be required before leave to put up a new factory be granted ? Let the Municipal Councils be authorized to refuse a maker leave to start a new factory unless he has got together 30 signatures—or 25—or 20.

M. l'Abbé Charest—Not less than 30 signatures should be required.

M. Castel—This plan should, I think, be modified; the number of patrons is not always a test of the quantity of milk.

Mr. McGowan—Factories are not set up for patrons with only one cow, but for those who keep several.

M. Castel—Instead of mentioning the number of patrons, would it not be better to mention the number of cows?

M. D. O. Bourbeau—I represent, as you know, in this Association, the district of Arthabaska. This district carries on dairying as, no doubt, do all the districts of the province. I rise to inform you that we have investigated the question of small factories, trying to find out the best means of getting rid of them. In every instance, we found that the real culprits were the farmers themselves, who do not know their own interests. For want probably of information and proper experience, but more frequently through erroneous calculation, they have allowed too many factories to be built. But with experience our farmers have gained wisdom, for our farmers are not devoid of sense when their own interests are concerned; so they are now at work trying to root out the small factories from our district.

I have to compliment the Association on its efforts to promote the establishment of creameries, for it is these that are expelling the small cheeseries from our district. Means have been taken to convert the cheeseries into combined cheese and butter factories. Our farmers found out that it paid much better to have a creamery in a cheesery, and they all, as one man, set about it, and, at the beginning of the fall, they notified the cheesery proprietors that they had to prepare to start a creamery in each of their cheeseries when the spring opened. For, said they, it pays much better to make butter in the spring than to make cheese. I am positive that this conversion of cheeseries into combined factories will drive many of the small cheeseries out of our district.

I was travelling last spring through our parishes, some 25 or 30 miles from home, in the Chester hills, in the district of Arthabaska, when I met several farmers who told me that they were making a good deal of money with the creameries; that there were formerly three cheeseries where they lived, but that this year there were only two; one had been given up, because the farmers had tried to compel the proprietor to add a creamery to it. You can see at once why the owner of a small cheesery should object to add to it the fitting up of a creamery; on account of the expense; it would cost much more than a cheesery; to fit up a creamery with all things necessary to its working, costs a lot of money; and when the district is too small and the patrons do not bring much milk to the factory, the owner will of course refuse to lay out the funds needed to establish a creamery, and finds himself obliged to close his factory. The farmers there have divided themselves into two lots, and have formed two districts instead of three. And in our own locality, too, last fall, a maker had to shut up his establishment because the quantity of milk he received was not sufficient to warrant his installing a creamery in his cheesery.

The same farmer told me that, in his opinion, the profits he reaped from the creamery consisted not only in the cash received for the milk he took to it, but still more in the profit gained in the rearing of stock; that is, that the skim-milk he brought back from the creamery paid him more than the money he received for the butter. And this was true, for, in that county, I saw on each farm ten, twelve, even fifteen calves, lots of young pigs, being reared. The farmers had the good luck to sell these animals at a good price all the season; they were bought up last year, and so I suppose they were in this district as well as in others. The Province of Quebec had the good luck to sell off a great number of animals. Farmers are trying to replace, by breeding, the stock bought up by the Americans, and the cheapest way of doing this is by having creameries.

I say, then, in answer to the question, that when farmers shall have learnt the profits that can be made out of a combined creamery and cheesery, they will set to work to get them established all over the province; and then it will not be long before the numbers of the small cheeseries will have sensibly diminished.

This, then, is what is being done in our place: farmers go to the factory owner and notify him beforehand to get ready to build a creamery in readiness for the following spring; and if he is not in a position to do so, they warn him that they will build one themselves; so that the cheesery-man, being himself caught, decides either to build the creamery or to close his factory.

I thought it was useful to the Association to give them this information. We tried legislation against the small factories; we were told that members did not like to undertake this question, as it was too difficult. There are varied opinions about it; the deputies are constantly worried by their constituents, who are not always satisfied with the way in which the former speak in the House, and the deputies, not to displease their constituents and to preserve their esteem and confidence, prefer leaving such questions as these alone. I think farmers know their own interests well enough; when they shall have studied this question of combined creameries and cheeseries in their district, they will not hesitate about compelling owners to put the two into one, and I believe that by this means we shall see vanish a number of the small factories that at present exist, because, as I said before, the outlay is too heavy, assuredly too heavy, for he proprietors of small factories.

I trust that before long we shall see in this province a great number of creameries at work, and, depend upon it, they will have the effect of abolishing the small cheeseries.

Mr. Chagnon—The farmers of M. Bourbeau's district are evidently more intelligent than with us. Our men do not want large creameries. Some one buys an old horse; he then, for a trifle, or on credit, picks up a horse-power, and a churn, and there is the creamery ready to start. These are the factories I want to get rid of; it is this that injures our district; and I ask you to go earnestly into this question. If M. Bourbeau has people in his district intelligent enough to steer their own canoe, we, in our district, labour under a trouble for which I seek a remedy.

Mr. McGowan—It is to that point I would arrive, with the authorisation of the Municipal Council. If it were possible to obtain from the Legislature a law obliging all makers to take out a license from the Council, and if this license was to be granted to no makers except those who could get together a determinate number of patrons ; thirty, for instance ; no small factories would be established. A factory with only five or six patrons can evidently be no advantage, either to the patrons or to the parish. Therefore, if it were possible to pass a law to prevent the establishment of any factory until the maker had enrolled 30 signatures, that, I think, would be the best remedy. It is this you wish for, M. Chagnon, is it not ?

M. Chagnon—Yes, that is it.

An Unknown Delegate—Thirty patrons ; that is not much.

Mr. McGowan—I mentioned that number, but of course the Committee can increase it.

M. Chagnon— With this question is connected that of the bad milk delivered at the factories. If a maker has a dispute with some of the more important farmers about their milk ; if he refuses milk that is not fit for the purpose ; the neglectful farmer gets angry, sees his friends about it, gets them to take his part, and they decide to open another factory in opposition to the former whose maker had dared to refuse bad milk. These are the factories that ought to be crushed, and when they shall have disappeared, no more will be built, and we shall then be in a position to control the milk that is brought to us.

Mr. McGowan—M. Bourbeau suggests to us the establishment of combined factories ; you know fitting up such a factory is costly, and I do not think the makers would like to have such a double duty forced upon them. What might such a combined factory cost ?

M. D. O. Bourbeau—Two thousand dollars.

M. Chagnon— Yes, and two thousand more on the top of that. I have built two, and I know they cost about four thousand each.

M. l'Abbe Côte—Just so ! That is what it cost us Now, I want to add a word ; it will not take long. You all know that I run over the entire diocese of St. Hyacinthe as an agricultural missioner, and wherever I find myself, if there is a cheesery in the parish, I visit it, unless I am prevented. Well, I saw in one parish a cheesery that, during the whole summer, had only made 3 cheeses a day, and to this a creamery was added this fall. I told the people : you cannot possibly succeed in this way ; you will lose money ; there is another creamery close by, etc. It was no use ! They wanted to take vengeance on the neighbour who had started a creamery. Someone had offered to put up the mason-work for $1,150 ; I told them that if they added another $500 they would be nearer the mark. This man who was about spending $1,500 in putting a creamery into his cheesery, may perhaps receive, at most, 2,000 lbs. of milk a day.

In our own parish, there is a combined factory that has been at work for some years; in a district in which they were making last summer about five cheeses a day, the patrons went to the maker and said:—If you do not add a creamery to your cheesery we will desert you. The maker put up the creamery he is sure to lose money by it; but his patrons he will not lose. With this system going on, it will not be long before the same faults will be found with the creameries that are now being found with the cheeseries: there are too many of them. I am convinced that one single creamery is sufficient for a parish; and if a separator is put up in each division of a municipality to skim the milk, this will be all right, but have only one creamery in which to make the butter. This will pay not only the maker but the patrons too; they will have less distance to cart their milk to be skimmed, and besides, it is a settled point, that, with the same quantity of milk, better butter can be made in one factory than in three or four different factories. I visited, for instance, a creamery at Sabrevois, County of Iberville, in the early part of October; this factory had made, during the week of my visit, more than 16,000 lbs. of butter; it has eight skimming-posts in that parish and its surroundings. Its butter fetched the highest market price all the season. I saw another that made 10,000 lbs. of butter in one week in October; this man, again, had two skimming-posts in the parish; the cream was brought to him at the central factory. At Sabrevois, the making only cost 2 cts. a pound, and the owner was certainly making more money than another who might get 4 cts. a pound for making, if he only dealt with a limited quantity of milk. A creamery, either alone or combined with a cheesery, should never be started unless it has a prospect of receiving at least 10,000 lbs. of milk a day; with less than that, I opine money would be lost in it.

Such, gentlemen, is my opinion in this matter: I think that if all the small factories could be abolished, the farmers would be all the better off. (Applause.)

Mr. Wm. Parent—For my part, I thoroughly agree with M. Bourbeau as to the starting a creamery in the cheeseries. At home, it was found that it obliged the small factories to close, because they had not the means of adding a creamery to their factory; I think Mr. Bourbeau's suggestion is a very practical one.

M. J. de L. Tache—Last year, this question returned before the Convention, as it had done at all previous meetings. I perceive, by the remarks made to-day, that we begin to realise the fact that without legislative control no good result will be obtained. I am not sorry to find myself in accord with these gentlemen, because I have already proposed the appointment of a committee on legislation, charged with the duty of preparing a bill on the subject. Now, as to this, public opinion must be prepared beforehand. We are already in a more advanced stage of preparation than the other provinces as to the establishment of a legal régime over the dairy-trade, but I fancy there are still a good many rebellious spirits. Mr. McGowan asks, plainly enough, that the Municipal Councils should be forbidden to allow a maker to build a creamery or a cheesery until he has obtained the signatures of a certain number of patrons. The Abbé Côté suggested

the idea of not allowing more than one factory to a parish; for my part, I am about to give you an abstract of the notes I prepared last year on the subject.

Why are there so many creameries and cheeseries? The real reason of this evil is, that anyone has the right to start one anywhere; and this trouble w continue to exist so long as those interested shall not enjoy the right of preventing their establishment, and of abolishing the small ones that injure them.

The remedy for this evil will be found in a rule of law which shall regulate their establishment and number in a fixed territory. For my part, I see no objection to a specific law giving to certain farmers the right to make regulations about this matter. Under what conditions should the exercise of this right be limited?

1. The essentials of a large factory must be realised, that is, the majority of landed proprietors representing a sufficient number of cows, or representing an extent of territory sufficient to keep a proper number of cows in the near future.

2. Next, the chief reason for the establishment of small factories must be abolished: the inequality of the distances that each patron has to travel to the factory. If people had no reason for going to the small factories, they would not carry their milk thither. To get rid of this inequality of distance, the factory must take upon itself the carriage of the milk. In this case, those who live close to the factory will have to receive an indemnity, for there is no doubt that, under this law, the factories will pass under the control of the municipality, and embrace an extended territory, so without this indemnity, those near the factory would justly complain that they were forced to contribute to the cost of cartage equally with those who live further off.

If we obtain this legal régime, all acquired rights must of course be respected, and those proprietors who shal' be obliged to close their factories will have to be indemnified to the full value of their establishments. For it is clear that no law will ever be passed by which it is decreed that, at any given moment, a proprietor shall be obliged to close his factory and suffer loss without being indemnified.

That factories may bear the stamp of stability, they must be so fitted up as to be able to make butter and cheese according to the season and the demands of the market.

I think that under such conditions there is not the shadow of a doubt that we shall succeed in getting a legal régime capable of doing away with the trouble we complain of. (Applause.)

M. N. Garneau, M.P.P.—This is the first time that I have had the pleasure of attending a convention of the Dairymen's Association, and I must confess that I have been very deeply interested this morning in the discussion that has been carried on concerning small factories. If I understand the question, these small factories injure the dairy-trade because the cheese they turn out is not of so good a quality as the cheese made in the larger ones. The want of uniformity

in size, and the inferior finish of the goods make them lose a good deal in price I am not a maker, but I have heard enough about it to comprehend that these small factories are necessarily a source of injury to the trade.

Now, you are searching for means of arresting this evil, and I heard M Bourbeau express a doubt as to the inclination of the legislators to assist the Association on this question. It seems to me that there is a slight omission here. One is bound to suppose that those who own these small factories own them because they answer their purpose. One must suppose that if these people did not find the small factories profitable, they would take their milk to the large ones. There is certainly something in it ; I do not know exactly what it is, but there is decidedly something. Whether it be a saving in the distance to which the milk has to be carted, or in working with a less amount of capital I do not know, but some advantage there must be.

Some one mentioned just now the ease with which small factories can be started ; M. Chagnon told us that an old horse and a horse-power, bought on credit, suffice for the maker's establishment. Here, then, is a man who is a home ; he has only a trifle of money ; he is too far from the large factory to take his milk thither, but he sets up a small factory at his house and it answers his purpose.

You want to pass a law now, and you reckon upon the aid of the Legislature, to prevent a man from making his butter and cheese at home ; is not that the power you are aiming at ? M. Bourbeau told us just now that members looked after their popularity and would never discuss such a law in the House. He was right ; as a Deputy, I would not discuss a similar question without being able to bring it to a solution. Now, a law such as you seek would be a restraint on the liberty of the individual ; that is the obstruction against which you with continually be running your heads, if you try to get a law passed to prevent a man from making his own butter and cheese with his own horse and his own apparatus.

M. J. de L. Taché—That is not at all what I said : it would not be requisite that this law be imposed upon the province at large ; it will suffice that it should be obligatory on only a portion of the population over a certain fixed territory on the majority of the interested parties.

M. N. Garneau, M.P.P.—It will always be a difficult point to settle to know if you can impose a law, limiting the liberty of doing business in any way, on this one or that one of your neighbors. This will be a difficult question, and I see why M. Bourbeau, who himself has been a deputy, at once hit upon it.

I admit, as you do, that the effect of the small factories is to lower the quality of the cheese, and thereby lower its general reputation ; it would certainly be a good thing to get rid of them. Now, were it possible to convince those people, who take their milk to these small factories, that it would pay them better to deliver it at the large ones, even if they were further off, I think I know my countrymen well enough to say that, in such a case, the small factories would soon disappear. I think we should begin by trying the effect of persuasion.

We ought to show, by means of lectures, the damage the small factories do to the reputation of our cheese, and I believe that when our farmers come to understand the injury they bring upon themselves by these small factories, we should quickly see their end: a most desirable thing. Thanks, gentlemen, for your kind attention. (Applause.)

M. l'Abbé Côté—Last summer we held our meeting of agricultural missioners at Oka. The Ministers and other members of Parliament were present, and this question of small factories was brought up. I then hinted to one of these gentlemen that, before proposing this law, they had better wait until they saw themselves upon the point of being beaten at the elections. You pass the law, said I, you will be beaten neither more nor less on that account, but the law will have been passed, and those who succeed you will say:—"It is no fault of ours; we are not the authors of the law;" and the law will stand. "But," they replied, "we never find ourselves in such a position, for we are always sure of a victory, whenever we present ourselves before the electors." (Laughter and cheers.)

M. J. de L. Taché—In order to be a member of Parliament it is not always necessary to be a member of the Dairymen's Association, and I know well the objection invariably brought against the law in question, namely, that it would fetter the liberty of the citizens. To that I reply, that there are already many cases in which the liberty of the citizens is fettered, and I do not see that much complaint is made about them. For instance: in France, the telegraph, tobacco, matches; take our laws empowering the municipal councils to grant privileges to electric-lighting companies, for city passenger railroads, aqueducts, etc. I will go farther still, and I say that this is the tendency of legislation in both Europe and the States.

Now, we only ask of you a law enabling 50 or 60 farmers to say: We have milk, we only deal with our own milk, and in this state of things we want to be under a law preventing others from injuring us. It is the majority who will decide, who will prevent others from injuring them. Every one will be at liberty to make his own butter at his own place, provided he only deals with his own milk. That is all we want.

M. N. Garneau. M.P.P.—This comes to exactly that which I said. I understand that such a law may exist, only I lay the difficulty involved before you; I told on what account M. Bourbeau seemed to doubt the good will of the legislators in regard to it. I say, that if the majority of the electors ask for anything they can get it. The elector is all powerful, we know, we members. If you come before Parliament, and ask for a law approved of by a majority of the electors, I am certain you will get it passed, and I promise you for my part to back up the demand; but I stipulate, though, that this law be the expression of the will of the majority of the electors.

M. Taché—There is no doubt that public opinion has to be prepared. I have been speaking about this legislation every year for the last ten years, and each year I won a member of Parliament over to our side. I hope that in 55 years time we shall have the requisite number to get our bill passed.

M. J. Girard, M. P. P.—As I have only just arrived, I have not had the good fortune of following the discussion ; so it is rather difficult for me to pronounce an opinion on the different views expressed this morning. Only, at the request of my colleague, M. Garneau, I beg to say a few words. From that which I heard, it seems to have been determined that it was advisable that public opinion should be prepared to side with the producer of milk. That seems to be the chief object against which the struggle is being made. In my opinion, there is another party interested in dairying that would be still more capable of exerting a controlling power over the small factories : I mean the buyers of cheese ; that seems to be your real lever. Let them enter the lists, and I feel sure that the whole trouble will vanish. There is no other cure ; the buyers only buy what they want.

We have in our place a dairy organisation ; a pretty perfect one we think ; and we found that there existed on the part of certain buyers a tendency to encourage competition if possible. I heard at the meetings some of the buyers making great speeches, showing how it was necessary that the cheese should be all of the same colour, uniform in size, and as big as possible, etc., etc., and yet that very same summer I saw in our parish buyers paying more money for inferior cheese than for good. I saw that myself. I saw another buyer in my district compel the inspector to receive cheese that he wanted "to cut" a cent and a half. The producer objected to this, sent his cheese to the same buyer at Montreal and got the full price. How can you expect that, with two weights and two measures, we can succeed in having good cheese and in obtaining the requisite uniformity ? it is practically impossible.

But if an understanding could be arrived at, in virtue of which cheese-buyers would cease exciting, to their benefit, competition through the small factories, there is no doubt about these small factories being obliged to close, because they are only working as long as they make something by it. That is my opinion.

And now, gentlemen, as regards the possibility of passing the law in question, I must confess that I am rather of the opinion of M. Garneau. It is a difficult thing to rise in the House and support a law which will paralyse trade. Still, if all the members, in both Federal and Local Houses, agree to it, the electors will have to submit. But for that, we must first of all get the buyers to side with us.

I hear some one observe that the small factories must anyhow bring in some profit, or else they would not be kept open ; I know some factories that are ruining their owners, who keep them open all the same, because profit is not their main object, but it is a mad ambition that impels them. I know of places where there will be plenty of small factories next year ; it is spite that is the chief cause of their erection. They are built too often from a desire to punish one's neighbour.

If we could popularise co-operation here as in Europe, I think that would be our best remedy. If we could then persuade the buyers not to pay as much for a bad cheese as for a good one, I think we should really be improving.

Mr. Ed. McGowan—M. Girard has just been speaking about the buyers; I believe there are several present, who may have a word to say in their own defence.

M. Chas. Milot—Since we cannot get rid of these small factories, why not pass a law compelling them to become syndicated? I think that would abolish them. Even if it did not diminish their numbers, it would at least attenuate their defects. I am not in favor of small factories, but I must say that I have reached the market with lots of cheese that have won for me the compliments of judges of the article. There were in these lots cheeses that had been made in small factories; for it is easy to see that in a small factory the maker has more time to devote himself to the care of his cheese.

Mr. Ed. McGowan—But supposing that a factory had only enough milk sent in to make a cheese every two days; do you think that cheese would be a first-rate one?

M. Milot—No; there is, of course, a limit. I believe M. Garneau's idea a good one: persuasion and emulation. If the small factories do not pay, they will soon vanish. Some one proposed, too, the building of creameries; if creameries, costing three or four thousand dollars apiece, are to be built where there are only, say, ten patrons, do you think there will be many of them put up? Of course not. It is time that will cause the disappearance of the small factories.

I would rather propose that the makers should be compelled to join a syndicate. Let the Government help us; let it take the best means of forcing the makers to join syndicates, and the making of bad cheese would soon be at an end.

M. S. Chagnon—Where I live, it does not cost four thousand dollars to build a creamery. They are just butter factories that we have; they do not cost more than a few hundred dollars: a twenty-dollar horse, a second-hand horse-power, and that is all. In Mascouche village, within ten arpents of the high-road, there were three of such creameries set up, while, only a mile off, there was already a good one—that makes four manufactories. You may depend upon it that the three last ones did not cost $4,000 each. It is of such as these that people complain.

Mr. Ed. McGowan—Then, why does not the Association pass a resolution praying the Legislature to make a law limiting the number of creameries to one to each parish? Do you not think that enough?

Several Voices—That depends upon the size, etc., of the parish.

Mr. McGowan—That is enough; a creamery to each parish.

M. l'Abbe Côte—If there are several divisions in the parish, set up several skimming-posts, but only one creamery.

Mr. McGowan—If you have one creamery in a parish, that is sufficient. Have as many skimming-posts as you please, but only one creamery to a parish. Our legislators can pass a law to that effect, but not without being requested to

do so. When a thing is wanted, it must be asked for. I propose that the Association ask the Quebec Assembly to pass a law to that effect.

M. Chagnon—At our place, there is a farmer who built a factory by himself alone. He competed with me ; he began by taking thirteen patrons from me, but two months afterwards he had only four of them left. They have that creamery all to themselves.

Mr. Robert Ness—You all know as well as I what an honour it is to us that the Dairymen's Association is holding its convention here this year. You owe that honour to the invitation of your Municipal Council, aided by the efforts of Mr. McGowan and myself.

I thank you, and congratulate you on your having come hither in such numbers this morning to be present at the session. You have all been interested, and I assure you that you will be still more interested in the sessions that will follow. Attend them all, then, and bring your friends with you in crowds, that these gentlemen may see that we are indeed a large family.

Mr. McGowan—Mr. Ness has just told you that we succeeded in getting the convention here : not without opposition, though. I see with pleasure how numerous the attendance is this morning ; I thank you for it, and I trust that there will be still more attendants at the sessions yet to come. For you must please to remember that Mr. Ness and I became your guarantors, and promised, in your names, that you would attend *en masse*.

AFTERNOON SESSION OF 6TH DECEMBER, 1898.

M. J. D. Guay—We have left aside this morning the remarks on dairying in Canada that Mr. A. A. Ayer was to have read to us. Mr. Ayer is represented here by Mr. J. H. Scott, who will now address you.

REMARKS ON CHEESE-MAKING BY MR. J. H. SCOTT.

I listened with pleasure this morning to the discussion on small factories. It would be a good job to get rid of them, but I do not think that can be done by means of a law ; for there is no law that can compel a man to close his factory while he is carrying on a trade for his own profit. I think M. Milot suggested the true cure for the trouble, when he proposed that a law should be enacted compelling the makers to enter a syndicate. When once these syndicated factories are all under inspection, it will not be long before, even if the small factories are not done away with, their chief drawbacks will disappear.

Some one said that this depends on the buyers. I do not agree with him. Buyers prefer buying in large lots to buying in small lots ; but they cannot refuse a lot of cheese, perhaps of the best quality, for the sole reason that it is

not a large lot. Frequently, the buyers arrive with 25 or 30 different lots, and we find that the smaller lots are the best. It would not be in the interests of the buyer to refuse these lots because the quantity is less than another lot of inferior quality.

I am asked to say a few words to you on the subject of green or unripe cheese, and on the practice observed here of exporting cheese in an insufficiently fermented state. The maker must look after this question with attention. If he makes and exports a cheese of the finest quality, he will fill his purse and help to raise the reputation of Canada in the foreign markets. It is a bad plan to export unripe cheese ; it impairs our credit, and frequently causes serious loss to the exporter or the maker. Not only is the quality deteriorated, but it also loses part of its value on account of its remaining green and dry, instead of being ripe, rich and fat. Many cheeses are put to ripen in common sheds! No terms of condemnation are too severe to describe these sheds : they dare to call them ripening-rooms, while they are no more than drying-rooms.

I think it would be to the benefit of all, if the cheese were kept in a good ripening-room for, in the fall, 25 to 30 days, and in summer for 15 to 20 days.

The room should be so constructed that the maker can keep therein a regular temperature of 60° to 50°. It should be on the same level as the floor of the factory, and not above it, where all the moisture that escapes from the factory would have the effect of heating the cheese and causing it to mould on the top and sides.

The ripening-room should be so built as to keep out the cold in spring and fall, and the heat in summer. Professor Robertson has drawn our attention to the great losses incurred by the exportation of unripe cheese ; he has studied the question most attentively, and I believe that he is in a position to give valuable information to makers concerning the best modes of building ripening-rooms.

I would also draw the attention of makers to the need of always using the best kind of boxes for butter and cheese ; they should be uniform in size. I have already noticed an improvement in the make of these boxes, but there is still much to be done. Makers should use the vertical press, and pay more attention to the finish of their cheese. (Applause.)

M. E. Castel—Mr. Scott told you that Prof. Robertson has drawn the attention of the trade to this question of badly-ripened cheese. A bulletin on the subject of ripening-rooms for cheese has just been published at Ottawa, which may be obtained by all who are interested in cheese-making by addressing an *unpaid* letter to Prof. Robertson, Dominion Commissioner of Agriculture and Dairying, Ottawa.

REMARKS BY MR. A. W. GRANT.

In reply to the invitation of your President, I beg leave to say a few words on the necessity of keeping everything in the dairy clean, and also about the quality of our products. It is quite useless to repeat here that without cleanliness, it is perfectly impossible to attain to quality, at least to the finest quality. There is plenty of room at the top of the scale ; but it is only the finest qualities of butter and cheeee that ever reach it. It is a twice-told tale, I know : but it cannot be too often impressed on the patrons, that in the milking of the cows and in the subsequent care of the milk, it is impossible to be too regardful of cleanliness ; that cows too often eat pretty nearly every kind of food, and that the water they drink is chiefly to be found in stagnant, muddy pools. Unless the cow eats nothing but good food, and drinks no water that is not pure, the milk cannot be what it ought to be.

Travelling a few years ago through the Cheddar Valley, in the County of Somerset, England, I was forcibly struck with the care and attention paid by the farmers to their pastures. I asked one of my friends what it was that a man we saw in the meadows was gathering, for I could see nothing in the field but green grass : a genuine lawn it was. "The man," replied my friend, "is pulling up weeds." "There is no wonder that you can get 15 cents a pound for your cheese, wholesale, with such careful work as that," said I. "True," replied my friend, "for if the cows were to eat these weeds it would injure the quality of the cheese and affect its price." It is in that district that the famous English Cheddar is made, that sells so high, and it will be easily understood that the land there lets for a good rent.

As to the treatment of the milk that is intended to yield a cheese of the best quality, not only is a skilled maker needed, as well as a well-mounted factory, but also and before all a good ripening-room, where the temperature can be kept at between 65° and 70° F., and to ensure that, it must be thoroughly isolated, furnished with an underground drain, and a heating apparatus : steam or hot water. No fewer than 600,000 to 800,000 cheeses are spoilt every season in Canada in the ripening-rooms, the greater number by the heat of summer, the remainder by the cold of spring and fall. This is not only a direct loss of $200,000 to $300,000 to the farmer, but an indirect loss of much greater consequence, since these cheeses must be sold, badly ripened and decayed as they are, and when they are worked off on the English consumer it has the effect of lessening the consumption by at least 25%, in my opinion ; the prices, too, suffer, for in thus cramming an inferior article into the consumers, there is, as I said, a double loss.

Now, let us examine the question from another point of view : suppose these 600,000 or 800,000 cheeses had not suffered in the ripening-room, would not the question be reversed ? Instead of the consumption being reduced by 25%, and the price lowered, should we not have an increased consumption by, perhaps, 50%, and two or three cents higher prices than those paid in during the last few years. In my opinion, and I have no doubt about it, such would be the case.

There is no place in the market nowadays for inferior goods of any sort; and we must thoroughly understand, the sooner the better, that it is not the different qualities of cheese that compete the one with the other; but that the cheese production enters into competition with all the rest of food products, and reciprocally. Although cheese is the most condensed and the most nutritious of food-products, if there were not a pound of cheese made, the population could manage to do without it; it is not the same with butter, bread, and, most likely, with beef. Thus, cheese is, at least in a certain sense, an article of luxury, more or less, and it will become so in a positive sense, unless we manufacture it of that superior quality I have just described.

As to butter, I am a convinced partisan of the necessity of pasteurising the milk or the cream, and of using the commercial ferments. The English market wants butter, salted at the rate of about 3%, pale in colour, not containing more than 9 or 10 per cent. of water, soft and silky in grain, and with a delicate aroma. I have a special demand for a butter with at the most 2 per cent of salt, for which I can pay a little more than the ordinary price; but in so fresh a butter the quality must be strictly "A1.," for in such butter there is not salt enough to conceal the defects.

Butter should be sent away from the creamery every week, or as soon as possible; it should be kept in the lowest possible temperature. Ten degrees above zero of Fahrenheit's scale is about the best temperature for the butter-store. All butter freshly made that remains a week in a refrigerator at a temperature above 32 F., is gradually losing its pink of condition, and at the end of that period is no longer of the very finest quality, in spite of its being generally classified as "very fine."

Mr. D. Macpherson—Spoke in English. The following is an abstract of his address:

He was happy to see so many farmers attending the convention to learn all about dairying. The people here are beginning to understand the importance of cleanliness in the dairy. No man alive can make good butter or cheese with inferior milk.

There is one essential point to be considered by all who want to succeed in dairying; it is to produce the raw material in abundance and at the least possible cost. If milk is to be produced at a cheap rate, the land must be well manured. But how can the land be properly treated if you allow your dung to lose itself in the snow and flow off into the brook in a thaw? Farmers ought to take the greatest possible care of their dung, both liquid and solid, and expend it in the enrichment of the soil.

The soil thus enriched will yield more hay; with more hay there will be more milk; then the milk will cost less, and yet the profits will be greater.

The only way of getting at cheap milk, is to make your land yield as much hay as possible. But it is not alone necessary to make your land yield its full quota of hay, it must be given to your stock: a farmer should never sell a single bundle of hay.

It is not sufficient to produce a good article; the article must be produced cheaply, so as to obtain the greatest possible returns for the capital invested in a business.

LECTURE BY MR. J. D. LECLAIR.

PASTEURISING MILK AND MAKING BUTTER.

All the world over, everyone is busy investigating the nature and effects of *microbes* or *bacteria*. By the study of their methods and the modifications they produce on the medium in which they live, some of the secrets of nature have been extorted from her. By clever processes, the beneficent nature of one kind and the injurious nature of others have been discovered. Physicists have succeeded in propagating one kind to profit by the increased sum of good produced; and to get rid of those whose effects are injurious and dangerous, and that are an obstacle to the realisation of the results searched after.

Milk and its products, forming an important part of the food of man, have been the objects of particular study, and this has caused some turmoil among those engaged in dairying. Starting from Europe, this disturbance reached the American shores, and quickly made itself felt from one ocean to another; hence, our dairy industry is in daily expectation of considerable changes in its mode of conducting its operations. Sound economy consists in appropriating every fresh discovery, but not without, previously, having carefully considered the points of superiority it claims, and determined that, thanks to this superiority, it will secure a saving of time and labour, or support the trade at the same level as its competing trades, either by improving the article dealt in, or by suiting itself to the new demands of the market. The discovery that threatens to revolutionise the dairy trade is the application of "pasteurisation" to the manufacture of butter and cheese.

Now, what do we understand by "pasteurisation"? In its more general acceptance, it means the application of heat, at a temperature varying from 150° to 175° F.; in dairying, it is the keeping of milk or cream at that temperature for a given time. The bacterial examination of milk or cream before and after pasteurisation, shows that a multitude of germs, of the more dangerous order as are almost all germs of lactic fermentation, have been destroyed by the operation. Converted into butter and cheese, it is believed that milk or cream thus treated may be consumed without any danger, in spite of any infection that may have affected the original matter. This immunity, given to the consumer, has certainly a vast range, and apparently is the principal reason of the adoption of pasteurisation in the making of butter. In England, public opinion seems to have been greatly excited by recent reports, from which it would appear that

not only milk, but also butter, are vehicles of dangerous germs, whose presence is frequently detected in milk. This, however, is a question of hygiene which is not within our province.

The main point for us to determine is: does the process ensure to the product, i,e., the butter, a superiority over other butters? This superiority, are we to look for it in a more delicate aroma; in a greater yield; in greater keeping qualities; or in greater uniformity? This superiority once established, there would still remain the question of whether it is sufficient to make up for the additional cost of the ferment of pure culture, of the work and cost of the process, and especially of the purchase of the apparatus indispensable in large factories.

Is the aroma of butter from pasteurised milk or cream more delicate? If we are to believe the advocates of the ferments of pure culture, pasteurisation having for effect the rendering inert the ferments of milk and cream, finding itself thus free from all fermentative principle, the addition of a sound and appropriate nature cannot fail to produce the aroma desired. This is the application of the proverb: one reaps what one sowed. But here presents itself a difficulty which does not as yet appear to us to be solved: is this promised fine aroma practically gained, and is its presence constant? Pasteurisation is now, we may say, general among the Danes in butter-making. Is it the case that since its introduction the reputation of Danish butter has increased? I, for my part, have nct found it stated that there has been greater delicacy of aroma in the Danish butter of late, than in the past.

This question of the pasteurisation of milk for butter-making has been the object of persistent experiments at the Wisconsin University. The butters were examined twice, at intervals of a fortnight, as to their aroma. What was the result? The average marks obtained was in favour of butter from unpasteurised cream by 0.03. A strange result, is it not, to oppose to the advocates of pasteurisation and commercial ferments? Shall we then decide that pasteurising confers no marked advantage on butter? Far be it from me to proffer to you such advice. For we have, on one side. no details of the quality of the milk used in the experiments, and on the other, they made with a single culture, a lactic ferment from the same source. Without wishing to injure the firm whence the Wisconsin University procured its culture, I must inform you that, according to my experience, it is impossible to be sure in advance of the value of the pure culture one buys. And in face of the contradiction apparent in these experiments, I must recall to your minds that, in 1893 and 1894, I used a commercial lactic ferment, and with better results than to-day. So, gentlemen, I do not hesitate to come to the conclusion that the question of the improvement of butter by pasteurisation is far from being solved.

Does pasteurising the milk or cream produce a greater yield of butter? According to the same report from Madison (University of Wisconsin), I see nothing that warrants this conclusion; and I do not think it has any weight at all.

But will not butter from pasteurised milk or cream keep longer? The Danes, whose butter always goes into immediate consumption, can give us no

information on this point; the Madison experiments only assign to the butter from pasteurised milk an advantage of 0.35 of a mark over butter from unpasteurised milk.

Lastly, would not pasteurisation be the means of making a butter more uniform in flavour and in other qualities? This reason, I am inclined to admit, should have more weight than the preceding ones; for, in spite of the Madison experiments not seeming to leave it more chances than the others, we must admit that, if the process of pasteurisation does come into fashion, there must be some good reason for it. Nevertheless, I must avoid drawing any determinate conclusion, and limit myself to submitting for your consideration the balance-sheet I have drawn up, founded on the Madison experiments:

TO THE CREDIT OF PASTEURISATION.

Hygienic benefits.....	....beyond our competence
Improved aroma.....	....not settled.
Longer keeping	....hardly perceptible.
Greater uniformity	....no precise data, but presumptively favourable.

TO THE DEBIT OF PASTEURISATION.

Cost of pure culture. Work and cost of pasteurisation. Cost of apparatus.	Can these be considered as compensated by the uncertain benefits enumerated above?

If, on account of the benefits to the public health, more or less proved, we shall have to pasteurise our milk or cream, by way of ensuring for our butter a hold on the English market, we shall clearly have to discard all other considerations, and, we must, bon gré mal gré, have to introduce the process into our system of manufacture, especially in winter.

Setting this case, of the public health, aside, I think it would be wiser not to begin pasteurising except from the fall to that period of the winter when the fresh milk begins to come in; and for this reason. To the question: Must we pasteurise throughout the year? or, in other terms, to express my meaning more fully, will the process applied to the milk or cream, at all seasons, invariably cause a more delicate aroma? we have just seen the solution in the Madison experiments; but it would doubtless be premature to come to this conclusion, particularly, as I said just now, since the report of the experiments gives no details of the quality of the milk employed in them. We know that they were carried on from February to August; which leads us to believe that they were made, at least partially, with fresh milk (1); but in what proportion? Besides, we do not find that, in judging the butters, any account was given of the date of their being made. Now we know, by the reports of Prof. Robertson, that the milk of a single fresh-calved cow, in a herd of eight, suffices to perceptibly

(1) That is, I presume, the milk of freshly calved cows. A. R. J. F.

improve the quality of the whole as regards butter-making; no one disputes this. The effect of pasteurising and of the ferments of pure culture, which would be to render the butter as high flavoured as it could be under the best natural conditions, will be so much the less perceptible, as the conditions under which we work are nearer perfection. It is this that leads me to the conclusion on this point, that, except in the case of pressing demand from the consumer, pasteurising is not absolutely required throughout the year, but only when the causes that affect the quality of the milk, such as its age, the food, stabling, &c., show themselves in an emphatic manner, to the detriment of the aroma of the butter.

I stated just now, à propos of the ferment of pure culture, that I had obtained more satisfactory results in past time than I can obtain to-day ; but I must observe that the greater part of my experiments only consisted in the addition of a ferment of pure culture to unpasteurised cream ; and as long as the English market does not rigourously demand the pasteurisation of our butter, I opine and this is what I shall do in my own place, that we can adhere to this practice. A preliminary pasteurisation is not assumed ; this does not enter into the limits of this essay ; still I thought it right to mention it here, on account of the results obtained by myself and others thanks to its employment.

A point remains to be considered : shall we pasteurise the milk or the cream ? Pasteurising the milk, involving pasteurising the cream too, would have the immense advantage of preventing certain contagious diseases from propagating themselves from herd to herd, and would be highly useful in seasons of epidemic diseases. Yet to extract all its advantages, the skim milk must be cooled immediately after the operation, and this cooling is a question that merits serious consideration.

If we examine the question of pasteurising the raw material, from the single point of view of the making of butter, I am inclined to think that it is better to treat the cream alone ; to say nothing of the saving realised by the small quantity that is treated, the number of bacteria found after pasteurisation being far smaller in the cream than in the milk.

In conclusion, as a practical statement, I would say that, in exceptional cases of bad milk, pasteurisation can only produce good results ; that in cases where the butter, by reason of the season or other known causes, has no longer its normal quality, the addition of a ferment of pure culture to the cream can only be productive of good : but I pray you to observe that you must never use any ferment without being certain of its quality.

I will add that our system of winter-butter making might be improved so as to considerably lessen the inferior quality of the milk ; and if farmers who produce milk in winter took the proper means of having the milk of a certain proportion of fresh-calved cows, the butter-makers would find their difficulties sensibly diminished. (1)

(1) M. Leclair's lecture was followed by the report of the Judges on the samples of pasteurised cream butter, offered by M. Leclair. These samples, having been subsequently submitted to a fresh examination, and being at present the subject of a chemical and bacteriological analysis, the completed report of the experiment will be published later in an appendix. E. C.

DISCUSSION.

M. Chagnon—Would you be good enough to tell us how makers can pasteurise cream without going to too much trouble ?

M. Leclair—Pasteurising must always require time and care. The lecturer whom you will hear next will tell you all about the need of cleanliness in a factory ; that is one of the first conditions; the factory *must* be kept perfectly clean, so that there shall be no noxious germs. The object of pasteurising is to destroy noxious germs ; consequently, the maker who intends to practise it must place himself under such conditions as shall give him a fair prospect of success. Pasteurising cream on a small scale can very well be done in the cream-vat ; this is what we did at St. Hyacinthe, as we had not enough cream to make it worth while using a pasteurising apparatus. We heated cream up to 140°, kept it there for 20 minutes, and then cooled it as quickly as possible. In less than 15 minutes it was at the temperature we desired.

This work can be done in factories if they are in a proper state. This demands a little work, and a little time, but it can be done.

M. Chagnon—In summer ?

M. Leclair—It would take a good deal of ice.

All the cream we used was brought down to 70° F. We added to it 5% of a pure culture ; then, we maintained it at 70° F. until 7 or 8 o'clock the next morning, when we cooled it to the proper temperature for the churn, which, as you know, varies according to the temperature of the churn-room. We invariably pasteurised in the same manner, applied the heat for the same time, cooled in the same time, added the same quantity of ferment, and, as far as possible, gave the same degree of acidity. By such treatment, we secured a proper fermentation in 24, and even in 22 hours.

M. Chagnon—How much ice did it take to cool the cream ?

M. Leclair—I cannot tell you exactly ; it depends upon the way in which the cooling is done. The best plan would be to have a special cooling apparatus. In summer, this work of pasteurisation cannot be done in the cream vat ; there must be a special apparatus and lots of ice.

M. Chagnon—What might a pasteuriser cost ?

M. Leclair—Different prices : $50, $75, $100, etc.

M. Chagnon—Do these machines require much less ice ?

M. Leclair—These are not refrigerators ; a special machine is required for cooling.

M. Chagnon—Would that cost about the same price as the other ?

M. Leclair—Such a machine can be made cheaply. But, after all, it is a good deal of bother and it takes a great deal of ice, this pasteurising of the cream. There is always enough to do in a factory, and one ought not to add to it unless great advantages are in prospect.

M. l'Abbé Côté—Would not pasteurising give a queer taste to cheese? I found it so in some I tasted that was said to have been treated so. Is this taste preferable to that of cheese made from ordinary milk? I am not a judge of cheese, but I think that this practice does change the taste, and that it prevents it from getting mouldy. The cheese I saw was a year old, and not the least mouldy.

M. Leclair—The question of the advisability of pasteurising milk for cheese-making is not yet settled; but I think, upon the whole, the testimony of those who have tasted the cheese you speak of is very much in its favour. Now, as to the flavour of such cheese being different, that is very likely. Milk is never pasteurised for cheese without a ferment being added. Now this ferment gives the cheese its own special taste; and thus it happened that the cheese you tasted had not the taste of creamery cheese.

M. l'Abbé Côté—The cheese in question had something like the flavour of Gruyère; I do not quite know, but M. Castel, who sent it to me, can tell us all about it.

M. Castel—Others have found the same taste that you did. Their opinions were divided on the question of its aroma. There are some persons here who tasted the cheese and can give us their opinions. It was judged at the competition of dairy-products, last October; a cheese, made in this way, I sent to have the opinion of the judges, and they awarded it 45 marks for aroma and 30 for texture. It only lost one mark on appearance; as it had been made 8 months, its toilette was a little less fresh than it had been.

M. J. D. Guay—Who made this cheese?

M. Castel—It was made in the St. Hyacinthe Dairy-school. M. Desmarais passes me an article on the cheese that appeared in the "Prix Courant," which I will read to you:

"We are indebted to the politeness of Mr. J. A. Vaillancourt, the provision-dealer, for our acquaintance with a novel dairy-product, which, in our opinion, has a brilliant future before it.

"This novel product is a cheese made at the St. Hyacinthe Dairy-school, out of pasteurised milk. The cheese we speak of was made last winter. We find it has kept well, which is easily conceivable, since by pasteurisation all the various germs in the milk that are opposed to its preservation are destroyed. The aroma is delicate, and there remains on the palate an after-taste of Gruyère cheese that, in our judgment, is a good quality and not a defect. The cheese is firm and the texture good; the grain fine, and, in a word, it is clear the maker understands his business.

"Such being the case, we think that this cheese would command on the English market a price that would pay the makers well who might make cheese of this quality, whose keeping property, as in the present case, is indisputable."

This conclusion is perhaps premature; the study of the mode of making must be pursued. Last week, for instance, cheese was made from pasteurised milk that was far from giving the usual results. There are certain phenomena that occur and escape us easily, especially with such trifling means of control as we possess.

An Unknown Delegate—Does the Association intend to introduce pasteurising into the practice of cheese-making?

M. Castel—We cannot speak positively as yet. The experiments ought to be continued through at least one whole season. When M. Leclair spoke about the Madison School, he told you that the experiments made there were continued from February to the end of the season.

M. Chas. Milot—Will you tell me, please, what sort of milk should be pasteurised? Good or inferior milk?

M. Castel—Good milk would be rather injured than benefited by pasteurising it, for whatever man may do he cannot improve on the work of the Almighty. It is better to deal with good milk than to have to cure bad. Milk is like man: better be well than be made well; to need being made well, presupposes a state of sickness.

M. Milot—I think that in making pasteurisation known to the patrons, we should be encouraging a vice. They will trust to it, and take less care of their milk.

M. Castel—No, but we are studying these points in order to supply a demand from our English clients, which may soon be manifested. The English import an enormous quantity of butter and cheese from abroad. This importation hurts the English farmers as well as the extensive proprietors of land. So that, the English Dairy-Farmers' Association interest themselves greatly in the position of the dairy-trade abroad. Two years ago, in England, an extraordinary campaign was instituted against Danish butter; people hinted that the water on the Danish farms was full of tuberculous microbes, and that the microbe was present in the butter.

And this was the reason why the Association began its experiments in pasteurisation, to respond to a possible requisition from the English market; so that, when the hour or the call shall render it necessary, we shall be in a position to be able to make either butter or cheese with pasteurised milk.

Two years ago, a Chicago paper sent a specialist to Denmark to study the progress of its dairy trade. This man saw butter being made from pasteurised milk, and he laughed at it. After his return to the States, he found that ideas had changed on that point, and he set to work to make butter from pasteurised milk as the others were doing; he even won the first prize.

We may have to make butter from pasteurised milk before long ; it is far better that we should study how to do it now, so as to be ready to respond to the demands of the market when the time comes. (Applause).

LECTURE BY MR. D. M. MACPHERSON.

THE BACON TRADE.

This, as well as all the other lectures delivered in English, could not be stenographed, so we can only give an abstract of it.

If we have succeeded in establishing a reputation on the foreign markets for our bacon, without any special study or effort, it is because we have a suitable climate and conditions in our country, which enable us to produce pork of the finest quality.

Therefore, if we earnestly study this question, and give to it all the attention we devote to other business, we cannot fail to gain the highest reputation that we can desire for our country as regards the production of bacon.

The practical side to be considered in this trade, is the profits we make out of it. Now, the hog weighed alive is worth 4 cents a pound on the bacon market. Can we produce pork at 4 cents a pound live weight ? The experiments I have made, under by no means favorable conditions, teach me that I can make pork for 2 cents a pound live-weight. I find that I can, on an acre of land, produce 6,000 lbs. of pork, which, at 2 cts. a lb., give me a return of 100 dollars an acre. (1) Moreover, the acre of land on which I fed my pigs has received the best possible manuring for the subsequent crops of the rotation.

Three years ago, I fed 30 pigs on two acres of land in clover. According to my experience, from 20 to 30 pigs can be grazed on an acre of clover. The pigs are turned in young, and get, in addition, a little grain daily, beginning with half a pound a day, and increasing by degrees till the dole reaches 3 lbs. ; the rest of their food they get from the clover. I feed them thus till they weigh about 150 lbs. Pigs fed thus grow muscle (lean meat), and get their fat from the grain ; and in this way we make the best possible pork for the market.

Twelve pounds of clover is the proper seeding for an acre. It should be sown as soon as the snow goes; the nightly frost and morning thaw cover the seed, and it has only to wait for the warm weather to start into growth ; and when started it grows rapidly, so that, when three or four inches high, it is ready for the pigs.

There ought not to be more than 70 to 80 pigs in an enclosure, i.e., the fields for grazing pigs should not be larger than 2 or 3 acres.

(1) 6,000 lbs. an *acre* are equal to 5,077 lbs. an *arpent*, nearly. A. R. J. F.

Treated thus, the pigs will weigh 200 lbs. at 7 months old, and then is the time to slaughter them.

The best pigs for the purpose are a cross between Berkshires and Yorkshires; cross-bred pigs are always the most easily fattened.

The pigs are weaned at 7 weeks from birth: they are then kept in the house for 3 or 4 weeks before being turned out: this is the treatment I have found answers best in my experiments.

When the pigs are out in the field, they need a shelter to sleep under, and straw for litter.

To make pigs pay, they must be fed cheaply; so pigs should only be kept 7 or 8 months in the year, the months in which they can be grazed as before said.

Fatten young pigs by preference; we shall thus avoid winter feeding, a season in which they are subject to diseases, such as rheumatism, etc Keep plenty of sows but few pigs in winter, so as to have lots of pigs in the spring, to be fattened in the summer. For if we can during the summer fatten pigs for 2 cts. a lb., they would cost us 4 or 5 cents in winter, and there would be no profit.

The English market takes 555 million lbs. of pork a year, and we Canadians are sure of a good market and rich returns therefrom, for no people can fatten hogs under more favorable conditions than we can.

Let those who intend to go into this business begin on a small scale, with, at first, only one sow, and go on by degrees. If they find it pays, they can increase their stock by degrees; but do not launch out at once into great speculations; you will succeed best by proceeding slowly and carefully.

When sows are due to farrow, they must be carefully fed, kept dry and lightly fed, with neither barley nor other grain.

SESSION OF WEDNESDAY EVENING, DECEMBER 6TH.

SOLEMN OPENING OF THE CONVENTION.

ADDRESS OF WELCOME.

Mr. Geo. M. Loy, Mayor of Valleyfield, bid the convention welcome, and declared that Valleyfield felt itself highly honoured by the Dairymen's Association. He trusted that the meeting would be completely successful.

The Mayor saw with pleasure the great number of the most distinguished; personages of the country who were in attendance at this meeting of farmers

proving by their presence that the day is past when the farmer was regarded with contempt ; as for himself, his highest ambition had always been to become a thriving farmer. He bid everyone welcome from the bottom of his heart.

ADDRESS OF M. J. D. GUAY, PRESIDENT, *pro tem.*

My Lord, Mr. Mayor,

Honourable Ministers, and Gentlemen.

We have been regretting all day the absence of our President, Mr. Milton Macdonald, who is unable to attend our meeting, and we have every reason for regretting his absence. But, having to supply his place, and to speak here this evening before the ecclesiastical and political dignitaries who are present, I must confess that I, individually, regret more than ever our president's absence.

Our president had this evening an important part to play in our programme; he was one of those who had to supply the greater part of the discussion of this evening, and I am convinced my colleagues regret his absence as much as I do.

But if we are deprived of our president, we have at least the consolation of having at this our opening session the presence of eminent persons who thereby confer great honour upon us. We are deeply sensible of the honour done us by Monseigneur Emard, the Bishop of Valleyfield, in associating himself with our labours. We quite understand the importance of the part played by the clergy in our province, even when farming and dairying are concerned. We do not al hail from the district of Montreal ; I, myself, come from afar, from the distant mountains of the Saguenay ; but there, as elsewhere, the clergy, with the Bishops at their head, have rendered services to the cause of agriculture and colonisation, for which we are indeed grateful. I know well that in the Montreal district the clergy have equally aided our work. Sixteen years have we been labouring to promote dairying in this province; we have done our best to increase its popularity, to make our people see how very important it is to them, and in this endeavour I am proud to say, to-day, we have been strenuously aided by the clergy.

I am rejoiced to see here present the Honourable Minister of Agriculture from Ottawa. Our Association has had many devoted friends since its formation, but I say with truth that few if any of them have shown so much devotion to its work as the Hon. Sydney Fisher. I have never attended a convention of this association in any part of the province without meeting Mr. Fisher there, making himself, like the rest of us, an active member of the association, paying his yearly subscription, like the rest of us, and profiting by every opportunity to tell us how happy he is to be of service to us ; and we have often profited by his kindness in our behalf.

I am also glad to have the opportunity of thanking the Hon. M. Déchène for coming hither to meet us. Our Association was founded to assist the progress of agriculture, whose interests that gentleman represents at Quebec. We have already received grants in favor of our society, and we are not threatened with any

proximate loss of them. But in addition to this, we need from the Minister of Agriculture at Ottawa and the Commissioner of Agriculture at Quebec, their most active moral support. We need, in every circumstance, the encouragement of our Association by these gentlemen with their most ardent incentives. They are here this evening to assist us, to help us along in our work, and we find they are, as always, well inclined toward us, and we are convinced that in the future they will do as much, if not more, for us, as they have done in the past.

I cannot close my address, gentlemen, without offering thanks, in my own name and in those of my colleagues, for whom I am now and always acting as interpreter, to the so prosperous town, and the Board of Trade of Valleyfield, whose guests we are this evening. The Mayor of this town has bidden us welcome, wished us success, and prosperity. I thank him for myself and for my colleagues; I thank the town and the Board of Trade for the kind reception they have offered us, and I trust they will find nothing to regret in having thus treated us. Our Association has always been pleasantly received wherever it has met; this shows that throughout the province the agricultural population, the commercial population, and the manufacturing population as represented here this evening by the manager of the cotton factory, appreciate the services rendered to the farming-class by the Dairymen's Association.

My Lord, Messieurs, the Ministers, members of the clergy, in fact everybody, pleased to accept my thanks for your attention. (Applause).

The Bishop of Valleyfield, Monseigneur Emard, then addressed the meeting in eloquent terms and with touching emotion. His Lordship spoke of the benefits of agriculture throughout the ages, and recalled to the minds of his hearers the delights of a country life.

N.B.—Those who were present at the Valleyfield convention will, with us, regret that, at the repeated request of His Lordship, we consented not to publish the stenographic report of the eloquent words that, by creating in the meeting a current of sympathy, contributed greatly to the success of the session.

SPEECH OF THE HON. S. A. FISHER,

Minister of Agriculture.

Mr. President, My Lord, and Gentlemen,

I am very happy to find myself once more taking part in this convention; it is the twelfth time I have attended the annual meeting of the Dairymen's Association of the Province of Quebec. I have just listened with much pleasure to the touching eloquence of Monseigneur Emard, who has unveiled to us the beauties and the true spirit of agriculture, and I now feel still prouder than

ever of being nothing more than a simple farmer. For, Mr. President, I am only a plain farmer; it is my sole business; and if at present I am engaged in political life, if I have had the honour of being selected to fill the post of Minister of Agriculture for the Dominion, it is because I am nothing but a simple farmer. (Applause.) I know it; the reason I was selected by the Premier to fill the place in his Cabinet of the representative of the agricultural class is, that I am a farmer. If I lately entered into politics, it was because I found that politicians did not sufficiently attend to the interests of agriculture, and that it was necessary that there should be farmers in parliament to promote the interests of agriculture, and support the claims and the wants of the inhabitants of the country. (Applause.)

If, gentlemen, I have had some success in my political career, I am less proud of my title of Minister of Agriculture than of the opportunity that this employment affords me of doing something for the farmers of Canada. At present, there reigns throughout Canada great prosperity. I make this statement with confidence, as I have in my hand the figures that prove this prosperity; and the figures prove moreover, that if Canada is prosperous, its prosperity is due to the successful labours of our farmers. For what, in truth, is the best proof of our prosperity, if it be not the vast exports that we are sending abroad, and with which we are paying our debts to the foreigner. If we examine these figures, of our exports, we shall find that it is in agricultural products that the greatest increase exists, and, if you will allow me, I will read to you the figures that prove my statement. Two years ago, we exported seven millions of dollars' worth of cattle; this year, just closing, we have exported to the value of eight millions and three-fourths, an increase of 23%. Of bacon, we exported two years ago, to the value of four millions and one-half; this year, we have exported almost the double, eight millions, an increase of 82%. As to sheep, we have not done so well; there has even been a slight falling off. Two years ago, we sent abroad butter to the value of a million dollars; this past season, our butter exports amounted in value to more than two millions, an increase of 94%.

Our cheese exports came to fourteen millions, two years ago, and this year we exported for seventeen millions, an increase of 25%. As to eggs, two years ago the exports were worth eight hundred thousand dollars, but last year, twelve hundred and fifty-five thousand, an increase of 55%. Of wheat we sent abroad two years ago, five million and three-fourths' worth; last year, our exports rose to seventeen million three hundred thousand dollars, making an increase of more than 200%. Of flour, two years ago, seven hundred thousand dollars; last year, five and one-half millions; an increase of 653%. of oats, two years ago, seven hundred thousand dollars; last year we exported for three million dollars, an increase of one thousand per cent Of peas, our exports increased by 40 per cent. over the previous year. You see by these figures that our agricultural products have increased not only as to our home consumption, but also in the foreign commerce of the country. As regards butter and cheese, products in which our Association is more specially interested, we have not very largely increased our exports, but at the same time we have established a good name for them, and this year, perhaps for the first time, we have succeeded in delivering

butter in England in good condition. I have here the opinion of Mr. McKergow, the greatest exporter in Montreal, and President of the Board of Trade of that city : " We have," says he, "always sent a good deal of butter to England, but it is only recently that we have exported direct the best butter. The price in England to-day is 96 to 104 shillings the cwt. (112 lbs.) I feel convinced that the future has a great success in reserve for Canada's dairy trade. I tell you this because I know that you, personally, have a right to be proud of this improvement in our butter-trade. This improvement is due to the power we now enjoy of sending our butter to England in refrigerating rooms fitted up in the steamers." I have made arrangements with the trans-Atlantic companies to have these compartments in the boats that cross between Montreal and England. And it is owing to this that we can deliver our butter in the English market in good order. This is a step that, both as a farmer and as Minister of Agriculture, I am happy to have brought about for the benefit of the farmers and the dairymen of Canada. (Applause.)

We now find ourselves, gentlemen, in this position : not only has our export of butter largely increased, but its reputation in England is so greatly enhanced that the demand for it is greater than we are able to supply. As to cheese, we must not try to increase its production much ; we are already arrived at the topmost quantity we can get rid of profitably. But for butter, there is a great future, and we shall always find in England a market for the sale of that. In 1894, we exported from Montreal 32 thousand tubs of butter; in '95, 65 thousand tubs, and in '96 twice that number, or 107 thousand tubs. In '97 we sent abroad 220 thousand tubs, and this year, in the past season, 263 thousand. A grand increase, and progressively grand, as you see ; one which will, I am sure, continue for several years.

I am now about to prove to you that I was right in what I said about the reputation of our butter in the English market. In 1896, the best Danish butter fetched in the English market from 100 to 105 shillings the cwt. (112 lbs.) ; the same year, the best Canadian butter was only selling for 72 to 85 shillings the cwt.; that is, our butter was selling for 20 shillings a cwt. less than Danish butter. This year, I saw, in a Manchester paper, a report, according to which the best Canada butter was worth from 88 to 94 shillings, and on the same day, on the same market, the best Danish was only selling for from 76 to 94 shillings; (Cheers). That is, Canada butter was selling higher than Danish. (Cheers). Three years ago, Danish butter was always worth, in the English market, 6 or 7 shillings a cwt. more than Canadian ; this year, Canadian butter is worth as much as Danish. Is not this proof positive that the position of our butter on the English market is greatly improved ? Wherefore, I congratulate you on this state of things ; I wish you to understand that in future we can with confidence increase our production of butter, and that we shall always find a sale for it on the English market.

On our dairy-farms we breed cattle to supply ourselves with cows, but there is another industry intimately connected with dairying : I mean the breeding of stock for the butcher. Our cows produce calves ; a few years ago, for want of a market, these calves had to be knocked on the head. When first I was Minister

of Agriculture, there existed between Canada and the States a quarantine against Canadian cattle, on account of which the Canadian farmer could find no market for his calves and yearlings. I went to Washington, on the invitation of the Minister of Agriculture of the United States, to try to make some arrangement to abolish this quarantine; I succeeded in my object, and for the last 21 months that quarantine has no longer existed. I will show you the advantages of this arrangement as regards the farmer. It had been in existence for 4½ years, and during that period we only sent to the States 3,763 head of cattle, representing a value of 52,000 dollars. This was the entire export value of the 4½ years that the quarantine lasted. It ceased on February 1st, 1897, that is, 22 months ago, but I only have the figures for 21 months. Since the abolition of the quarantine, that is, during 21 months, Canada has exported to the States 140,452 head of cattle, representing a value of one million nine hundred and ninety-eight dollars. This market is a very great thing for us, for it was certainly owing to the quarantine that we could not sell all our young stock. We can now add to the profits we make by our dairy products the profit earned by the raising of young stock.

I will not detain you any longer; you see how difficult it is for me to address you in French; it is, unfortunately, not my own language, and in a country like Canada, where people of different languages have to live together, we ought all to learn to speak both tongues. (Applause). I am very glad that I have been able to talk to you in your grand French tongue, but I must pray you to forgive me my faults of pronunciation and of expression; all the same, I must hope I have been able to make myself understood by all of you. I thank you, gentlemen, for your kind attention. (Applause.)

DISTRIBUTION OF THE DIPLOMAS OF INSPECTORS OF SYNDICATES.

The Secretary of the Association then distributed to the following:—

M. Maxime Robert, St. Valerien, Shefford, with the remark very *good*;

M. Donat Collette, St. Roch, Richelieu, " " *good*;

M. Etienne Marleau, Howick, Chateauguay, " " *good*;

The Diploma of Inspector of Cheeseries.

And to Mr. Théodule Corbeil, Jr., La Plaine, Terrebonne, with the remark *good*,

The Diploma of Inspector of Creameries.

SPEECH OF THE HON. MIVILLE DÉCHÈNE,

Commissioner of Agriculture.

Mr. President, My Lord, and Gentlemen,

I did not expect to have to address you this evening; I knew not that my name figured on the programme, but since I must deliver myself up to judgment, I must begin by telling you that I am anything but lucky. His Lordship developed, in much finer language than I am able to use, some of the ideas I should have expounded; all the interesting statistics I had prepared Mr. Fisher has just imparted to you, so that I am almost tempted to believe that he stole them from me; and M. Guay discharged his duty so well in thanking the citizens of Valleyfield for the reception they accorded us, that there is not much left for me to say.

But this does not by any means lessen the pleasure I feel at having come hither to be present at this great convention, and to see how numerous is the crowd of farmers attending it. As His Lordship told you, the men who will address you this evening do not pretend to offer you instruction; they come more for the purpose of testifying to you their sympathy, their friendly feelings; to express to you the good disposition of the Governments they represent, and to assure you of the entire devotion to everything that can interest the agricultural classes.

I have a confession to make to you; it is that I am not a farmer. I represent at Quebec the interests of agriculture, I was elected by an agricultural county, all my relations are farmers, I myself farmed for some time; but my father, who had some power of divination (un peu de flair), said to himself: "This fellow will never do for a farmer; we'll send him to college." I am not prepared to approve his judgment or to censure it. I know well that farmers have disappointments to bear, as have advocates, and, still more, politicians. Farmers, when their day's work is over, trust to the Lord to give increase to the grain they have sown; but when the lawyer's day is over, there remains for him too often a sleepless night, and the politician, more than anyone, finds a nightmare replacing those smiling visions he hoped to find in his dreams.

His Lordship told you that the profession of the farmer is the greatest on earth, since it is the only one that confides alone in itself and in the Almighty; the farmer has never to hang about an empty office till unfortunate suitors knock at the door. He has only to work, be economical, and to trust in Providence that causes the seed to germinate, and the plant to grow and ripen; farmers only need industry and a spirit of good management to secure a tranquil, pleasant, and prosperous life.

As I told you at starting, gentlemen, I do not come hither to instruct you in agriculture. My opinion as to that art is that Governments should encourage all industries and discourage none; but that they should be very careful, very prudent, before they give their official sanction to one method rather than to another;

my opinion is that Governments should not put themselves too forward, but should give every possible chance to Associations of this sort, who keep in their road without concerning themselves with the mutations of the political world. In the past, I was a partisan so violent, so rabid, that I can tell you politics spoil many a good cause in this province; and to hinder politics from invading the bounds of agriculture, it is consoling to see such a society as this, a society that has taken hold of popular instruction, and has placed it on a higher level than politics; I do not say, has placed it on the side, but above, on high, on the very summit, protected from the dust of the lower ground, where political struggles work their will.

Immense progress has been made in dairying during the last few years; but we must not say we have reached perfection, seeing that peoples, like individuals, who imagine that they have attained perfection, are those who approach the nearest to their fall. Our aim must always be *excelsior!* We have sent more than 50% of the cheese consumed in England to that market, so we must hardly try to go beyond that in that branch of dairying, but divert our activity to the production of butter, though by no means neglecting our cheese. It is no longer for the increase of quantity we must strive, but to improve the quality, to make our goods more uniform, and we may be sure that if we work on those lines, we shall succeed in rendering our business more and more profitable.

I have requested M. Gigault to submit to you a proposal, to wit, if the Government should not now place at the disposal of the proprietors of factories a certain amount to tempt them to establish in their cheeseries good ripening-rooms? You see, gentlemen, in what very vague terms this policy we are inaugurating is couched. I leave to this convention, at its session of to-morrow, the duty of arranging the details of the manner in which this grant should be distributed. We have, in this province, to direct the energy of the farmer not only as to butter and cheese, but as to poultry, fruit, etc. We have to distribute its activity as much as possible into different channels, for if everyone were to devote himself to butter or cheese-making it would have the same effect as if everyone set to planting potatoes: there would be no market for the goods.

If we really desire to win our place in the sun of the English market, we shall have to extrude some one; at present, the English can buy everything they need, and if we want to sell them new goods, we shall only succeed by turning out some one who has already been doing business with them. We must not imagine that we can win this position there by reasons of sympathy alone, because we are an English colony; we shall have to win a place on the English market by the superiority of our products. When the English dealer buys butter, he wants the best and the finest in appearance; there is no market so difficult as the English market.

Since we arrived at power, I have done my best to encourage every species of agricultural industry in this province. I have tried to discourage the too numerous creameries, and especially the too numerous cheeseries that are being built in this country. The mischief is that there are too often too many factories in one parish. The makers are obliged to submit to be "cut," the goods them-

selves are "cut," and you yourselves pay the expenses. They say: We are six or seven miles from the factory. Well, this is true, and a misfortune it is; but it is a still greater misfortune to have too many factories in the same parish, for there are only a few private individuals who suffer in the former case, that of having to cart their milk a long way to the factory, while the inferior cheese made in the small factories injures the reputation of the Province of Quebec in its entirety. And the day on which the province loses its reputation for making good cheese will be a sad day for us all. It would be better to sacrifice a few patrons and save the reputation of the province. We are told: There are no roads! I must give my predecessors the credit they earned by improving the roads in the rural parts. We have kept on this policy, but changed the manner of conducting its working; we increased the subsidy granted by our predecessors for that purpose, and we have to-day 1,200 miles of road either re-made or improved after the modern plan. Already have two or three counties applied to Government for stone-breakers with which to make macadamised roads. I hope there will be other applications, as the need of them is felt, and before long those roads, that are the disgrace of the Province of Quebec, will have ceased to exist in their old form. As to municipal roads, we are behind Ontario, behind the European countries, the last country in the world probably. Men who study political and agricultural economy agree in the statement that bad roads are the heaviest burden the farmer has to bear. It is a burden for the farmer who, with the same horse-power, on bad roads, can only carry the half of the load he could carry on good roads, and, another thing, at certain seasons of the year, he cannot get to the railroad station. It is indeed a heavy burden, and will have to be got rid of, not because Government wants to get rid of it, but because the electors entertain the same desire. And when the bad roads are abolished, the small factories will vanish too. The municipal councils, never mind to which political party their members incline, can address the Government without even the interposition of their member, and can reckon upon getting the amount we allow to each of them. We have aimed at placing this question above all parties, and we appeal to all right-thinking men, under whatever political flag they are serving, or have served in the past.

This year, we have instituted some experimental fruit-growing stations. Too often, in certain parts of the province—I am not speaking of this district, for I have only been here once before, and I do not know how things are carried on here—but in certain parts of the province, the farmers, anxious to secure some of the blessings that an orchard near the house confers upon the family, have been deceived by men who sell fruit trees by the catalogue, show them splendid specimens, and such magnificent fruit that it makes their mouths water. The trees are bought and set out, and then it is discovered that they will not stand the climate, and the farmers who have made this trial are terribly disenchanted. We have established experiment stations in different districts of the province, to see what kind of fruit trees will suit this or that region: we have one at Chicoutimi, one at Gaspé, some we have in different counties, and in 5 years time we shall change them from place to place, so as to see what trees will stand our climate. And when conclusive data have been reached, we shall tell the farmers: These are the trees that will pay you to grow; these will stand the

peculiar climate of this or that district; you can of course try other kinds if you like, but Government will have done its duty in showing you those that will best answer your purpose. Since we have been in power, I have tried to encourage fruit-growing as much as possible.

In our efforts to improve the lot of the farmer, I am bound to say that we have been well supported by the two parties; M. Vaillancourt, for instance, whose principles are well known, has been of great assistance to us. The Governments, whether Liberal or Conservative, have always had the full and entire support of the Dairymen's Association, and I thank them for it, in the name of the farmers, in whose name I have the right, I think, to speak, as well as in the name of the Government.

Some remarks fell from the lips of the Bishop that I cannot pass in silence. He told us: Keep your accounts; it is the only road to success. You will often see in the papers political economy spoken of as one of the most difficult of the sciences; in my opinion, it is the easiest of them all. Cut off the word "political," and there remains the simple word "economy" (1): That is all the farmer need know about this complex science. For the farmer, as for all classes, economy is the key to success. Try not to spend more than your income, but less, and when old age is reached, when you are advancing towards the cemetery with a more accelerated stride, there will remain for your latter days something tangible and some provision for your family. I know that this is perhaps one of the sore spots of the French-Canadian. I am well aware that economy is not the most frequently practised of our virtues; we may well console ourselves that we have plenty of other good qualities; still, the quality of economy would by no means hinder the exercise of the rest. When the farmer shall become saving, not only will he be rich, but the whole province will be rich too. When the farmer is in prosperous circumstances, all other classes of society are doing well. It has been said that agriculture is both an art and a science, and it is true. The farmer needs not only the machine with which he works, but he also needs the knowledge that teaches him to study the prices of the market and their variations. He must be mechanic, blacksmith, in fact he should know something of everything.

When the farmer prospers, the nation is full of life; of this, I only need the example of what passed in France, our mother-country, a few years ago. After '70, when her armies had been beaten; after the sad days of Gravelotte, when the Germans were occupying a great part of France, when there were no generals left, and the army was almost entirely scattered, a man of genius turned to the agricultural class, and that which the army had been unable to do, the French peasant accomplished. He expelled the enemy that was in possession of France. When the question was as to the providing of the seven milliards of francs ($1,400,000,000.00) required to eject the German from the sacred soil of France, it was to the peasant they turned; he opened his chests, in which lay in safety the savings of many a year; he paid the ransom of his people, and the army of the enemy had to take its road back to Germany.

1. (Literally, "House-management.")

Thus, Gentlemen, the wealthy peasant was able to save France; he was wealthy because he had been saving, because he had always thought of the morrow. And when the evil day arrived, the statesmen turned to the peasant, whom they had but too often contemned, and said to him: The army exists no longer; it is now your turn to save France! And, as I told you, the peasant it was who, in very deed, was the one who freed the country.

Well, Gentlemen, be you too always ready to be the liberators of the territory of the Province of Quebec, if a call be made upon your energies and resources. And as we are successful in agriculture, we shall be able to transmit to our descendants the same inheritance that our fathers bequeathed to us. (Applause.)

M. J. D. Guay—I desire, in the name of all those interested in dairying, to thank the Hon. the Minister of Agriculture at Ottawa, and the Hon. the Commissioner of Agriculture at Quebec, for the speeches they have been good enough to address to us. To attend this Convention, in spite of their occupations, was already much; but for Mr. Fisher to prepare so important an address, and for M. Déchène to come hither and, profiting by the opportunity, to announce to us the good news concerning the grant he proposes to make to factories for ripening-rooms; this was more than we had any right to expect. So I wish to offer them our thanks in a most special manner.

M. Déchène told us that he wants the Association to point out to him under what conditions this grant should be made that the best results may be derived from it. This is a compliment we highly appreciate. I see that, even if M. Déchène is not a farmer, he is by no means ignorant of the needs of the Dairyman, and he thoroughly understands that, far from the small cheeseries being deserving of encouragement, the sooner they are abolished the better. He by no means intends that this grant shall serve to keep the small factories going, for they are dying of inanition, and that is the reason why he seeks to know, from those who make dairying their special business, the best way in which to expend the grant. I therefore thank M. Déchène in an especial manner for this compliment, and for the service he is rendering to the dairy-industry.

M. Vaillancourt—I beg to be allowed to say a few words. You, Mr. President, have thanked our ministers for their addresses, in the name of the Dairymen's Association; I, in my turn, desire to thank them in the name of the trade, which also knows how to appreciate the services they are rendering to the dairy-industry. We knew as well as any one the disadvantage it was to have our goods reach the English market in a damaged condition. The Hon. Sydney Fisher had already given us cold-storage to keep our butter safe before it was sent off to the shipping ports; he granted, I think, a hundred dollars to each of these storages, and I trust he will continue this grant. The Hon. Miville Déchène offers us assistance in improving the ripening-rooms; there will be found means of getting a law passed to forbid cheese leaving then until it is fit for exportation. Cheese is often sent out now that is, after all, nothing but milk-curd, and this does immense harm to our trade. This practice it is my duty to denounce; it happens sometimes that cheese put under the press on

Thursday, is taken out on Friday, and sent to market on Monday. How can our cheese win a good name, if it is subjected to such treatment? When we have good ripening-rooms, if it were possible to compel the makers to keep the cheese until honestly ripe, it would be of great service to our dairy-trade. There is no doubt about M. Déchène helping us with all his heart; I hope to visit him often at Quebec, and as we are the spoilt children of the country, I trust we shall always be well received there. The good children should be protected as well as the naughty children.

Mr. C. H. Parmelee, M.P.—(Abstract.)—I deeply regret not being able to address you in French; I do not speak your fine language well enough to make myself understood in it; so, with your kind leave, I will say that which I have to say in English.

Like M. Déchène, I am no farmer, but I have felt for many a year how important the dairy-trade is. Those to whom I am speaking, being chiefly occupied with this business, know even better than I what a source of wealth it is to the country.

I am glad to acknowledge here that the Association has always been bravely supported by the clergy of the province; they encouraged the people, opened a road for them. I might say as much for the different governments of this country; they have done everything in their power to impart to the dairy-trade all the activity which it was capable of exercising.

But now, we must not sleep on the success we have already obtained, for we are not the only nation providing goods for the English market; there are the Danes, the Australians, and others, who are all struggling to grasp the first place there, and we must not let them win without a fight for it; we must contend manfully for the first place they are reaching after in the English market, and we are just as intelligent and skilful as they are.

I would offer you, as one of the best means of success in the butter-trade, the "cold-storage" plan. By this means, we can place our goods on the foreign market in all their original good order. The ruling powers have done their share to ensure us refrigerating compartments on board the steamers and on the railroads; it is our duty and advantage to avail ourselves of their aid.

When I see the papers praising the government highly for the great success we have obtained in dairying, I cannot help thinking that, after all, the man of the fields, he who milks the cow and ploughs the land, that he too deserves his share of praise.

We are probably not so far advanced in dairying as some of the other provinces of Canada, but we shall have overtaken them before long, and in a few years, if they do not look out, we shall have passed them. With all the advantages we possess in the Province of Quebec, we have it in our power to succeed better than any people in the world.

I am not making a speech, but I must say that I was charmed with everything I saw and heard this evening. I thank His Lordship the Bishop for attending this convention ; I thank the farmers for being here in such crowds, and I thank the people of Valleyfield for all that they have done for the Association.

Year after year, the deliberations of these meetings are printed and distributed among the members of this Association, constituting a valuable source of instruction. The mischief is that, owing to the vast distances that have to be travelled, we cannot get together sufficient numbers at these conventions.

We were talking just now about the small factories; they are disappearing by degrees in my neighbourhood, because the taste has turned more to butter-making. If we could divide our energies and make some butter and some cheese, we should find it pay better than making all butter or all cheese. Let us be guided by the advice of this Association which has always given good counsels to our people. I can say this without boasting, because the work was done before I joined : this is one of the best institutions of the kind in America, and I do not believe its superior can be found.

I thank you for your kind attention, gentlemen, expressing once more my regret at not being able to adress you in your own tongue. (Applause).

ADDRESS OF MR. LOUIS SIMPSON.

GENERAL MANAGER OF THE MONTREAL COTTON COMPANY.

(Abstract) Not being able to speak French, I will not detain you long Although I am not a farmer, I feel deeply interested in agriculture, not only because I have to direct the farmers employed by the Montreal Cotton Company on its farms, but also because I love agriculture, and I feel, moreover, that the prosperity of the country at large depends greatly on the well-doing of the farmer. So, if I cannot speak to you this evening as a farmer, allow me to address you as a manufacturer, and tell you that if you, farmers, seek to derive profit from farming, you will never succeed unless you impart into your farming the business-principles of the manufacturer. A farmer of the common type, that is one who grows only oats and hay for sale, far from making money, must inevitably come to grief ; but if the farmer converts his oats and hay into first-rate butter and cheese, not only will he make money, but he will at the same time be improving his land, so much so, that, year after year, his crops will be more considerable. Persuaded of this truth, as I am, I did not hesitate, manager of a Cotton Manufacturing Company though I be, to become a life-member of the Dairymen's Association of the Province of Quebec ; for I am convinced that it will accomplish a great and glorious work, if it could only persuade the farmers of the province that they must abandon their old routine, and become, one and all, manufacturers, aye, and manufacturers of the best products than can be found in the world.

There is no reason why this should not be brought about. Our farmers need protection ; our governments, past and present, have always protected them. As a manufacturer, I, who need protection for my trade, am glad to see that both political parties protect the farmer. The system of " cold storage," that the Minister of Agriculture has so wisely hastened to perfect, is, in some sense, a protection granted to the farmer, as it is thanks to it that his goods can be taken to the market and sold at higher prices than he could otherwise obtain. But there still remains room for further improvement ; the system will not be complete till the railroad companies are compelled to furnish proper sheds to receive agricultural products, in order to prevent butter and cheese from getting spoilt by remaining on the platforms of the stations in far too great proximity to foul-smelling goods : coal-oil and salt-fish.

Lastly, Gentlemen, I must tell the farmers of Canada that I foresee for them a brilliant future, if only they will accept the modern ideas that both the Hon. Minister and the officers of his department lay before them.

M. N. Garneau, M.P.P.—In the name of that district of Quebec that I represent, I beg to thank this Association for the invitation it sent me to come hither and address you this evening. Allow me next to congratulate the farmers of this district on the good example they are setting to the province in attending this convention in such crowds. Were I to attend to my desire alone, I should prefer perhaps to be silent, and to content myself by listening and learning as most of you are doing. This is the first time I have been present at one of these agricultural *fêtes*, and I am trying to find something interesting to say to you. Distinguished specialists are treating all agricultural questions. I might perhaps talk to you, farmers, about the Association itself. I have for several years watched its labours ; every year I read its report and I find it full of valuable information, not only from the point of view of the makers of butter and cheese, but also as regards the interests of agriculture in general. I will therefore say a few words on the improvements that have been made by the Association in the interests of farming since its foundation.

Without being an old man, I am no longer young, and I remember well the sad state of agriculture twenty years ago in this province. In those days, all those who could, left the country and came into the towns as servants, day-labourers, or anything, rather than work on the land. Hundreds of families left for the States at the same time. Travelling through our finest districts, we saw a crowd of empty houses, and if a passer-by was asked why they were shut-up, the reply invariably was: " Oh ! they have gone to the States." Did you follow up your enquiries as to the cause of their departure, you were told : " The land yields nothing now, and they left it ; if we could manage it, we would leave too."

When we reflect that agriculture is the basis of the wealth of a nation, and especially of our nation, in which three-fourths of the population are farmers, I shall tell you nothing new when I say that the leading classes were aroused by this state of things. Learned and devoted men asked each other if it were not possible to apply a remedy to the evil, and, seconded by our generous clergy,

who always do their best to aid the material progress of our country, they founded the Dairymen's Association. Some years afterwards, the efforts of the association, with the assistance of the different governments, saw farmer's clubs, lectures on agriculture, missioners, a dairy-school, breeders' societies, competitions of agricultural merit, &c., &c., spring into existence. The question of dairying was discussed as likely to extricate our agriculture from the atrophy that was throttling it. Competent men were sent abroad by our governments to study the question, as well as to look up the different markets for the consumption of our products.

And what do we see now, gentlemen? It is high time to ask if the efforts of these devoted men have been successful. On consulting the reports of trade and agriculture, I find that Canada's exports of agricultural products have increased by $27,000,000! When I look around on our lovly rural parts, I find on every side, cheeseries, creameries, bringing ease and content to every family that looks after its own interests, farmers proud of their position, wearing with pride the honorable medal of the Mérite Agricole; here, I see exhibitions; there, competitions of the best cultivated farms, ploughing matches, and governments freely making grants to everything that can contribute to the progress of agriculture.

"Looking through the reports of our colonisation societies, I find that our compatriots are returning hither by hundreds at a time, almost at the same rate as that in which they left us."

But, when I read the list of the members of this our association, I find, to my regret, that it does not reckon, in the whole province, so many as a thousand subscribers; ought there not to be, on the lowest computation, at least ten thousand? Would it not be fair to acknowledge in this way the services the association has rendered to the country as a whole? If we were more numerous, we should have more power, and be able to exercise greater influence on the interests of the farmer. We, in this country, do not know how to benefit by the grand associations established in the interest of agriculture. If we patronised our societies more freely, by attending their meetings and subscribing as members, we should before long have the pleasure of seeing the agricultural class occupying the place to which it is entitled in the Province of Quebec. (Applause).

M. Jos. Girard, M.P.P.—I most confess that I am slightly taken by surprise, for I did not come to Valleyfield to make a speech before a meeting so numerous as this, especially before men occupying such distinguished positions and so well informed as those who are honouring this convention by their presence.

I came hither to report to my friends at home all that I heard here. Farming is more advanced here than in the district in which we live, and I wanted to study here, as it were by stealth, the different systems you practise, to pilfer them from you if possible, so as to use them for the benefit of my neighbours. I have already learnt some secrets: I followed the discussions with pleasure, and I have

gleaned some information which will without doubt be of service to our district. Should any of you take it into your heads to visit Lac St-Jean, I think you will meet with indications of my having been at this meeting, and will find, transplanted into our region, several of your excellent methods.

I heard this afternoon Mr. D. M. Macpherson speak very practically, unfortunately in a tongue not understood by everyone, on the breeding of swine, and the profits to be derived from that business by the farmer. If I remember rightly, the breeding of swine is one of the subjects to which the Dairymen's Association has already drawn the attention of the farmers of Quebec. Mr. Macpherson told us that in this country pork could be made at about 2 cts. a pound. I am happy to say, not to brag about our skill, but to show that we too are looking after our business, that for the first time, from the 10th November to last Sunday, a thousand dollars in cash was paid to some thirty farmers of my parish who had started the breeding of swine. The price we received was not more than 5½ cts. a pound dead-weight, and the farmers are satisfied. Mr. Macpherson was right when he said we can grow pork cheaply. Even by selling it low, money can be made in our country. I desire to state these facts to confirm Mr. Macpherson's statements, as some persons seem to think he exaggerates. Doubtless he can grow pork cheaper than we can, on account of the difference of climate, but let us follow his advice, and we shall find our profit in it. I presume, gentlemen, that you began this practice a long time ago, but, if not, begin it at once without hesitation. We have tried in the depths of the woods, and we are well satisfied with it.

The Ministers who have addressed us show that they are well inclined to the farmer-class. The Commissioner of this province especially, made you a proposal, for which I am glad to offer him my thanks. It is the first time that a Government has troubled itself about ripening-rooms for cheese, and in assisting us to overcome our difficulties in this branch of the manufacture, he is certainly doing us great service. As to the feelings of the Minister of Agriculture, we have appreciated them for many a day. Mr. Fisher is for us, if I may so express myself, "un vieux de la veille" *(i.e., a veteran of Napoleon's old army. A. R. J. F.)*, one of the fathers of the Dairymen's Association; we know that he has supported it from the foundation, and that he will never abandon it until the day when Providence shall deprive us of his presence, a day that will be a day of mourning for the whole country as well as Quebec. (Applause.)

Mr. D. M. Macpherson.—(Summary.)—Here I am again, but this time as a farmer. I am happy to be present and to take part in your important discussion. The presence of His Lordship, the Ministers, and the other distinguished men whom I see here this evening, shows me there are people with us who are capable of promoting the interests of the farmer.

As has been already said, agriculture is of all professions perhaps the most difficult to learn and to understand. Farmers, then, should study their profession and try to thoroughly understand it. They have already made great efforts to that end and the governments have helped them as far as they could. But there still remains much to be done, and I think that before long we shall have

made a great stride along the path of progress. The governments have expended large sums of money during the last few years in aid of agriculturists, and I must say that they have been well backed by associations like yours. I have studied this question, and I am convinced that, with the same amount of money, the governments could now do a great deal more good by or through the intervention of such associations, if the farmers would only take a little more interest in them ; but the misfortune is, that farmers will not join these societies in sufficient numbers. In the county of Glengarry, for instance, out of 2,000 farmers, there are not a hundred who belong to agricultural societies ; in fact, I hear that these societies are likely to be abandoned altogether. This is indeed a misfortune and should be amended ; for there is nothing more conducive to the interests of the farmer in general than these societies.

MAGIC LANTERN SLIDES.

The session closed with an exhibition of magic lantern slides, showing views of the Danish dairy-industry.

These views, as they passed over the field, were illustrated by Mr. R. A. Lister, of the firm of R. A. Lister & Co., Dursley, Glo'stershire, England.

M. J. de L. Taché translated into French the remarks of Mr. Lister as they were enunciated.

Unfortunately, Mr. Lister's words could not be taken down by the stenographers, on account of the necessary obscurity of the hall in which the exhibition took place, and therefore we cannot have the pleasure of laying them before our readers.

The following is the list of the views :

1. Inner yard of a Danish farm, showing the well and the mixen close together.
2. Another inner yard, in the same condition.
3. Another in the same order.
4. Herd of Danish cows.
5. do do
6. A Danish bull.
7. A Danish horse led by a farmer's wife.
8. A Danish horse led by a farmer.

The above are taken from W. D. Young's pamphlet on Denmark.

9. An important factory, where milk is arranged for sale in the town.

10. The same, seen from the railroad, on the wharves connected with which it is situated.

11. Interior view of factory ; skimming and pasteurising room.

12. Automatic filling of the delivery cans.

13. Automatic bottling of the pasteurised milk.

MORNING SESSION OF WEDNESDAY, DEC. 17th. 1898.

The session was opened, Mr. Robert Ness in the chair.

"THE CURD-TEST."

M. E. Bourbeau—In conducting this curd-test, we collect the samples of doubtful milk in flasks, and place them in this box ; we then heat them up to 100°, add the rennet, strain and press the curd, and then allow it to ferment in the same manner as it does in the curd-vat, except that in our case the flasks are hermetically sealed. If there is any gas, it will develop itself more than usual, because the air is not renewed and the temperature is favourable to that action. If the milk had any bad smell, it will soon be manifested if the flasks are uncorked.

At the St. Hyacinthe dairy-school, last winter, we had some trouble with bad milk, as is but too often the case with winter-milk, for it is very difficult to judge correctly as to the quality of milk that reaches the factory at a low temperature ; this often happens at factories that work in the late fall. On account of the temperature, it is difficult to tell if the milk has been properly or improperly kept, is clean or the reverse. There may be injurious germs in it, and it is almost impossible to detect them on account of the low temperature. At the school, then, we had trouble with some of the milk ; we took samples of it, submitted it to the curd-test, and found out the patron who had sent in the milk. We searched for the cause, and we found it. This curd-test will surely prove very valuable to the dairy-trade, and I declare before you all that this apparatus is very useful and even indispensable. If, in the past, the "Babcock" has done us great service, the curd-test will be, in the future, still more serviceable, because when milk is simply watered, no damage is inflicted on our neighbours, except in proportion to the adulteration-swindle ; while, if damaged milk is delivered and worked up, not only is the whole factory injured, but the reputation of the products of the whole country. It is absolutely necessary that the use of this apparatus become general. This summer, our inspectors had orders to use it in every factory they visit when the milk was found to be out of order. The curd-test was employed, and the test led to the discovery, not

only of the faulty patron, but of the cause that had made his milk bad. I cannot see why every factory does not get one of these apparatus; the cost is trifling and it is of immense use. It is all very well to say that the patron is responsible for the milk sent in, but the responsibility does not rest on him alone. Many of the makers in this province are responsible for the present state of things. Frequently, the farmers send in bad milk without knowing it, and it is then the maker's business to discover the bad milk, the cause of its badness, and to apply the proper remedy. Now, in order to discover the faults in milk, a perfectly sure test is needed, and here it is that the curd-test is going to be of immense service to the maker. For, as I said yesterday, it is in vain to try to make good articles with bad milk: it cannot be done. But, with the curd-test, it will always be an easy matter to find out where the mischief lurks, and then to apply the remedy.

In Wisconsin, Mr. Decker, teacher of cheese-making in the Madison School, told me what was done in the case of a factory whose cheese had always a bad flavour. The curd-test was applied to the milk of every patron; the one in fault was discovered; of course he had no doubt about his milk being good, because he took every possible care of it. His farm was visited; the curd-test applied to each cow separately; two cows were found whose milk gave a bad tasted curd, they were got rid of, and the cream of the whole district felt the benefit of the discovery. It takes but little bad milk to damage the whole output of a factory; one or two patrons, or, as above, one or two cows, are sufficient.

Yesterday, you heard all about ferments of pure culture; well gentlemen, a bad can of milk is just as powerful, only it is more dangerous. If to a vat of good milk you add some bad milk, you may be sure it will contaminate the whole lot.

When you have examined the samples of milk tested by M. Plamondon, we, M. Plamondon and I, shall be happy to answer any questions you may like to ask us.

In this test, it may be we have not succeeded so well as we could wish.

M. Plamondon says the rennet is not good, not so strong as it ought to be.

M. Plamondon then described the effects on the samples of milk of the curd-test.

In order to give the readers of this report, as far as can be done, the benefit of this object lesson, by which those present at the Valleyfield meeting profited, we give here—from the Farmers' Bulletin No. 84, published by the Washington Department of Agriculture,—fresh details on the curd-test.

This bulletin is simply a summary of Bulletin No. 67 of the Experiment Station of Wisconsin.

By offering to the farmers of the entire Union a special edition of the Wisconsin bulletin, the officials of the federal government have stamped the importance of this test with its approval. Here then is a lesson that the makers and farmers of this province cannot fail to appreciate.

THE CURD-TEST OF MILK AND THE MAKING OF CHEESE.

In order that a cheese may be of uniform excellence, throughout, it is absolutely necessary that the milk from which it is made be uniformly good. Through want of care, ignorance or design (?), milk is sometimes delivered at the factory in bad condition. For his own protection, the maker, while acting fairly by conscientious, careful patrons, must be qualified to decide positively as to the quality of the milk delivered at his factory. It is especially in some districts, where it is the custom to exact from him certain guarantees, that he must keep himself informed on the latest and most accurate methods invented for determining the real value of the raw material.

The following is a description of the mode known as the "Wisconsin curd-test." The apparatus invented for this test is, in some degree, like the apparatus used for the "Gerber-test," and can be found at any of the dealers in dairy-fittings. However, a home-made affair can be used with good results.

HOME-MADE TEST-APPARATUS.

This is a simple tub half-full of hot-water; a set of jam-pots or preserve-jars, holding about a pint each, to hold the samples (C), a pipette (P), and a table-knife with which to break up the curd.

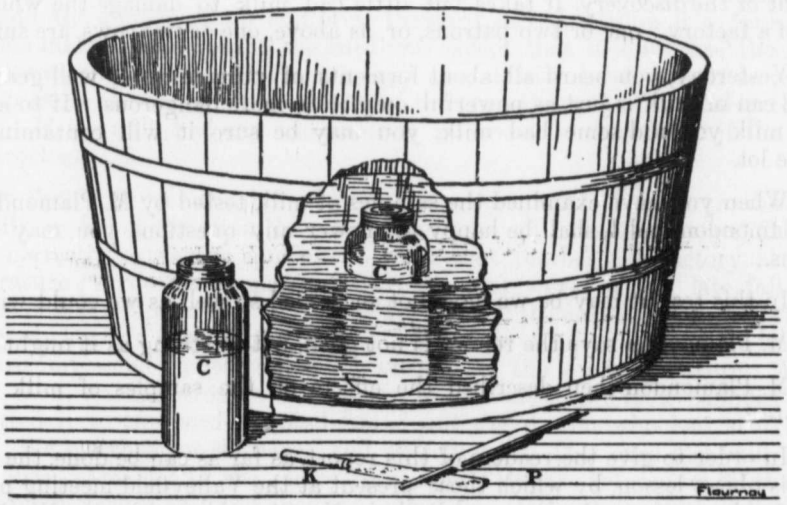


FIG. 1

Home-made Curd Test.

How to make the test.—Fill the sample-jars half full of the milk to be tested; place them in the tub and half fill it with hot-water. As a general rule, if the water is at 115° F., it will be hot enough to raise the temperature of the milk to the proper degree, *i. e.*, 98°. When the milk is very cold, care must be taken not to use too hot water, for fear of cracking the jars.

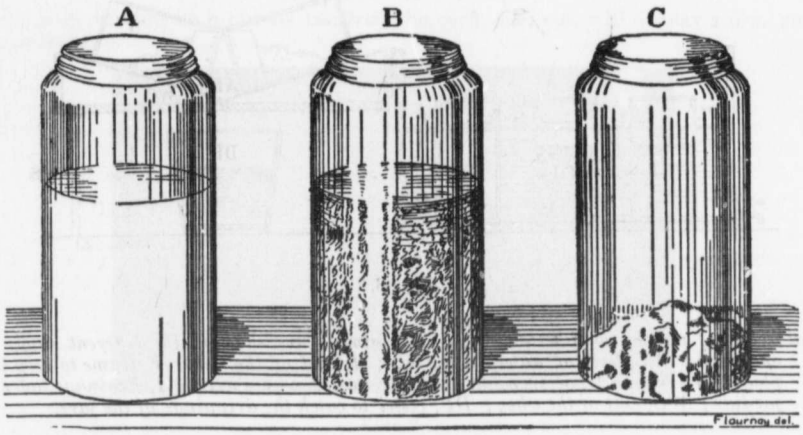


FIG. 2.

Different stages of the home curd-test. A. the milk ; B. the curd broken-up in the whey ; C. the curd in a lump.

When the temperature of the milk reaches 98°, add, through the pipette, 10 drops of rennet-extract and stir it in at once. Then, leave the jars alone until the milk is curdled, when, with knife, break up the curd into small pieces to allow the whey to exude. When using either thermometer to take the temperature, or the pipette to add the rennet or to stir up the milk, or the knife to break up the curd, *be particularly careful* to rinse these implements in boiling water, to guard against transferring a crowd of germs from one sample to another.

When the curd has sunk to the bottom of the jars, the whey is poured or drawn off, and the operation is repeated till the curd is solidified into a lump. By this means, the excess of whey is got rid of, with the fermentable sugar it contains, and this process is brought still nearer to the regular method of making cheese. The temperature of the water in the tub is to be kept up for 6 or 8 hours, to favour the rapid development of the germs present in the milk, etc.

This improvised apparatus will enable any cheese maker to conduct a test satisfactorily ; but a good deal of time and trouble can be saved by employing an apparatus epecially designed for the purpose of this test ; and as the curd-test should be in daily use in every cheesery, its utility fully justifies the cost of a special apparatus, a description of which here follows :

IMPROVED CURD-TEST.

The improved apparatus, v. figs. 3 and 4, has the following improvements over the one above described :

1. A water-trough, with a tightly fitting cover, allows the water to be kept hot longer than an open tub ; an important thing in cold weather.

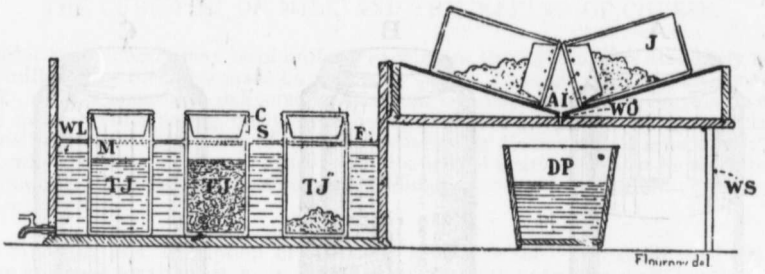


FIG. 3.

Vertical section of an improved test-box; TJ, TJ', sample-jars showing the different stages of the operation; WL, level of water in the box; M, level of the milk; F, frame to keep jars in place; WS, supports, of iron, to hold the turned over cover; AI, drainage holes in the jar-lids; WO, exit of the whey; DP, vessel to catch the drippings of the jars.

2. A tap allows the water, when getting cool, to be drawn off and replaced by hot water, without shifting the jars, thereby saving time and trouble.

3. A frame (F) keeps the jars in place; without this, they are very likely to lean over into the water when the whey is being abstracted from them.

4. The mouths of the jars are large and the sides upright, which facilitates the drawing off of the whey and the removal of the jars.

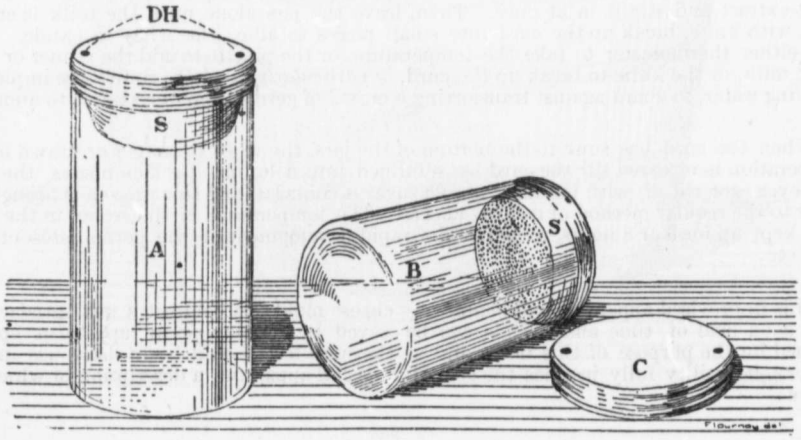


FIG. 4.

Improved test-jar; A. perfected test-jar; S. Strainer; DH, drainage-holes in the cover; B, test-jar showing the construction of the cover; C, the outer cover

(5) The strainer (S) in the cover enables the operator to place the jars in a sloping position to run off the whey, and thereby get rid of it both more quickly and more completely.

THE RESULT EXPLAINED.

If the milk contains no injurious bacteria, the curd, once cut, will display a firm, smooth texture, as in fig. 5.

FIG. 5.

Curd from good milk. Holes mechanical, wide and irregular.

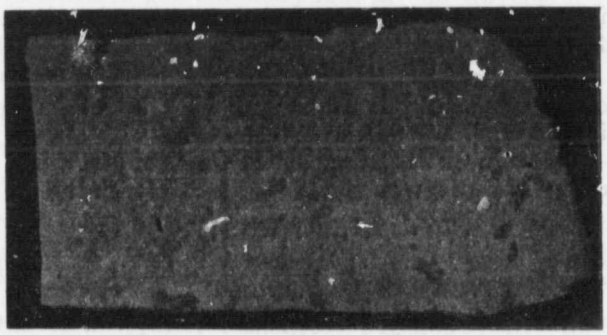


FIG. 6.

Curd from bad milk. Holes mechanical, wide and irregular; numerous pin-holes due to gas.

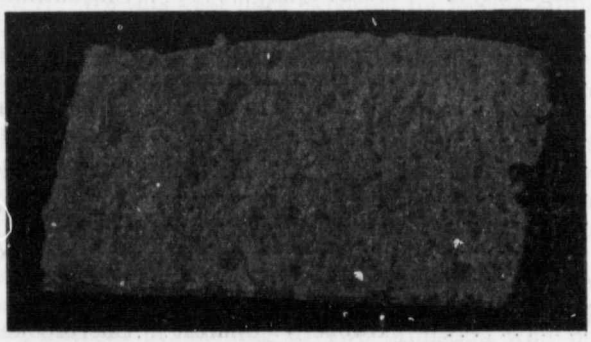


FIG. 7.

Floating curd from very bad milk; this state is brought about by the development of the conditions of fig. 6, or by a greater number of gas-producing bacteria.

Care must be taken to distinguish between such holes as are purely mechanical, that produce themselves when the curd "does not pack well," and those that are due to the gases of fermentation. The mechanical holes are irregular in shape, and varied in form, while the gas-formed holes are circular in shape and more uniformly distributed over the whole mass of the curd.

It must not be forgotten that the formation of gas is generally accompanied by other products of decomposition, of hardly pleasant aroma or smell, more, or less decided, and that the injury done to the cheese is rather due to them than to the purely mechanical presence of the gas; it also is possible that the products of the decomposition of the bacteria contaminates the milk, in cases where no gas is produced.

....The bacteria, that get into milk with the dust and filth that find access to it, are peculiarly prompt in producing these taints; and this kind of fermentation is of frequent occurrence in summer. In the curd-test, such milk is often condemned not only by the appearance of the curd, but also by the more or less prominent smells that it sets free when the jars are opened.

This test was successfully employed at the Experiment-Station and in many cheeseries in Wisconsin. In the hands of the maker of cheese, it seems to be a certain means of detecting contaminated milk; it is, besides, of special service in aiding to solve the difficulties that arise in every factory, between maker and patron, as regards the existence and the origin of contaminated milk.

ELECTION OF OFFICERS AND DIRECTORS.

The election of officers and directors of the Association for the year 1899, took place as follows:

OFFICERS:

Honorary President: M. Milton McDonald, M. P. P., Actonvale, Que.
President: M. J. A. Vaillancourt, Montreal.
Vice-president: M. J. C. Chapais, St-Denis en bas, Que.
Secretary-Treasurer: M. Emile Castel, St-Hyacinthe.

DIRECTORS:

DISTRICT	NAMES	RESIDENCE
Arthabaska	MM. D. O. Bourbeau	Victoriaville.
Beauce	J. de L. Taché	St-Hyacinthe.
Beauharnois	Robert Ness	Howick.
Bedford	C. H. Parmelee, M. P.	Waterloo.
Charlevoix et Saguenay	J. D. Guay	Chicoutimi.
Chicoutimi	Jos. Girard, M. P. P.	St-Gédéon, Lac St-Jean.
Gaspé	Alexis Chicoine	St-Marc, Verchères.
Iberville	Edouard McGowan	Ste-Martine, Chat.
Joliette	Sam. Chagnon	St-Paul l'Ermite.
Kamouraska	François Gagnon	St-Denis de la Bouteillerie.
Montmagny	M. l'abbé F. P. Côté	St-Valérien, Shefford.
Montréal	J. H. Scott	Montréal.
Ottawa	Louis Labelle	St-Jérôme, Terreb.
Québec	N. Garneau, M. P. P.	Ste-Foye, Qué.
Richelieu	J. L. Lemire	La Baie du Febvre.
Rimouski	Chs. Préfontaine	Isle Verte.
St-François	L'abbé V. Charest	Sherbrooke.
St-Hyacinthe	L. T. Brodeur	St-Hugues, Bagot.
Terrebonne	L'abbé Cousineau	Ste-Thérèse, Terrebonne.
Trois-Rivières	Charles Milot	Ste-Monique, Nicolet.

ADDRESS OF MR. J. A. VAILLANCOURT,

PRESIDENT-ELECT.

You must not expect a grand speech from me, gentlemen, for I did not expect the honour you have just done me, and I am utterly unprepared to address you.

My first duty is to thank you for the honour conferred upon me. I feel all the importance of the position to which you have just called me, and I tell you plainly that, though I do not feel quite competent to occupy it, you may believe that, since I have been selected, I will do all in my power, from a practical point of view, to fulfil my duties. (Applause.)

The Association and the Dairy School at St. Hyacinthe are going, so to speak, hand in hand towards the same destination. They have already done much for the dairy-trade, but we are far from having reached perfection; we have still many a mile of road to travel before we reach it; and it is the very height of my ambition to get our dairy-industry to traverse a few additional miles of that road. To do this I depend greatly on the advice and assistance of the board of directors, without whose support I should feel myself incapable of discharging the duties of the post to which you have called me.

I shall, then, do all I can to promote the improvement of dairying, and so to continue the work so well begun by my predecessors.

And for this I reckon also on the support of the clergy. Since His Lordship told us yesterday that the agriculturists were the partners of the Almighty, I see nothing out of the way for these gentlemen to labour for the progress of dairying, which is not the least important of the branches of agriculture.

And on the Hon. Sydney Fisher, too, I reckon greatly, for he has always been a great friend to the dairy-industry, and will continue to aid us, as he has always done. We never had greater need of his support. Dairying has become a national industry. We this year have exported for twelve millions of dollars of cheese, and for four and a half millions of butter. We had better not increase our make of cheese, but I trust that we shall make more butter than ever. I hope that, before long, with the aid of the two Governments, we shall manage to raise our exports of butter to twelve million dollars a year, the same as our present export of cheese. You have seen in the papers that our butter has gained a good name on the English market. Mr. Fisher told you yesterday the price we were getting for it; we are now on an equality with our rivals, and before long our butter will fetch a higher price even than the Danish butter.

You saw, yesterday evening, how the inclination of M. Déchène is tending; you see that his only wish is to help us; so that we can reckon upon him. We had the pleasure yesterday of listening to two Ministers, who not only speak well, but whose words may be trusted.

And now, gentlemen, there remains for us a mournful duty to discharge. Since the first foundation of our Association, it has reckoned in its ranks a man

whom you have all known and appreciated, and who was, if not the actual founder, at least one of the founders of the Dairymen's Association of the Province of Quebec. He was the most energetic athlete we have ever had among our members, and his name will for ever be connected with the restoration of the agriculture of the province. You all know that I am speaking of the regretted Mr. Edward Barnard. I feel that it is the duty of this meeting to pass a resolution of condolence, to be published and sent to the family now in mourning for Mr. Barnard. We feel sure that Mr. Barnard had none but friends among us, and this resolution will not only meet with the liveliest sympathy from us, but also with the most complete unanimity. (Applause.)

M. Louis Labelle proposed, seconded by Mr. Ed. McGowan, that a vote of condolence be sent to the family of Mr. Ed. Barnard, and that it be also published in the report of the convention.

Mr. Robert Ness—As I knew Mr. Barnard well, and esteemed him highly, I request that my name be added as seconding the motion. There are many more friends of Mr Barnard who would like to see their names figure in connection with this resolution, as a testimony to the family of Mr. Barnard of all their esteem for him, and of their sympathy with the bereaved ones.

M. J. de L. Tache—I believe that Mr. Ness wishes that several names should appear in this resolution, in order that those whose names appear in it may, by this means, be enabled to show to the family how great is the attachment they feel for the deceased. I think that the names of all those of the Directors who are present may figure in the resolution, some as proposers, others as seconders, in order that the whole of the family of Mr. Barnard and all those who knew him may understand that the resolution is the unanimous voice of the entire assembly.

RESOLUTION OF CONDOLENCE;

On the occasion of the death of Mr. Ed. A. Barnard, director of the Dairymen's Association.

Proposed by MM. D. O. Bourbeau, J. de L. Taché, Rob. Ness, C. H. Parmelee, M. P., J. D. Guay, Jos Girard, M. P. P., Alex. Chicoine, Ed. McGowan, Sam. Chagnon.

Seconded by MM. l'abbé F. P. Côté, J. H. Scott, Louis Labelle, N. Garneau, M. P. P., Chs. Préfontaine, l'abbé F. Venant Charest, l'abbé Cousineau, Charles Milot et Emile Castel.

That the Dairymen's Association, met in annual convention, being desirous of testifying to the family of the late Ed. A. Barnard all its sympathy on the occasion of the loss of its regretted head, and at the same time to consign to its

archives a fair and worthy appreciation of the services rendered, to agriculture in general, and to the dairy-industry in particular, by that eminent agronome, whose death is a cause of mourning to the whole agricultural population,

Determines to insert in the report of the present convention a portrait of the late Ed. Barnard, accompanied by a biographical notice, a copy of which shall be forwarded to Mrs. Barnard and the family, before its insertion in the report.

And that a copy of these presents be sent to Mr. Barnard's family and published in the papers. (1)

AN ACCOUNT OF THE LABOURS OF MR. ED. BARNARD.

Director of the Dairymen's Association ; Director of The Journal of Agriculture, and Secretary of the Council of Agriculture of the Province of Quebec.

A statement of the many services rendered to his country by the late Mr. Ed. A. Barnard has not yet been drawn up. On the day after his death, a Quebec newspaper, to which he had often contributed, sketched the following portrait of him, which the Dairymen's Association thinks it its duty to preserve among its archives.

Speaking of Mr. Barnard, M. J. P. Tardivel observes : " He was a model of a Catholic, believing and practising his religion as few do nowadays ; a Christian without any regard to worldly considerations ; one who would have confessed Christ at any sacrifice, and who, had he lived in the days of Nero, would have entered upon the road of martyrdom, not only with an unblenching stride, but with eager joy.

And this faith of his was by no means a barren faith : his labours show that it was a lively faith. Witness, for instance, the origination of the Pontifical Zouaves in Canada, which was his idea, and of which he was one of the most zealous promoters.

Our friend was essentially a disseminator of ideas. He was, beyond all dispute, the greatest factor in the progress accomplished by agriculture in the province of Quebec during the last thirty years.

(1) The names of the officials and directors of the Dairymen's Association present at the Valleyfield meeting figure in this resolution as proposers and seconders in the order of their inscription in the above list.

M. de Boucherville conferred upon him the title of Director of Agriculture, and this was indeed a fit title for him. Thanks to his numerous experiments, carried out mostly at his own expense ; thanks to his extensive information, to his spirit of initiative, to his ardent activity, to his indefatigable zeal, he was indubitably the Director, the Leader (*meneur*) of agriculture. He extricated it from its long travelled ruts, and gave it that impulse, the effects of which we experience to-day. All the reforms, all the progress that have been accomplished in farming since 1872, have been, more or less, his work. Nearly half his life was an apostleship of agriculture of the most productive kind ; for, even when his ideas were not accepted, they had to be discussed ; that is, to be studied, and by that study, the sluggishness so habitual to man was necessarily shaken off.

We may say then, without fear of contradiction, that he was a public benefactor, as we shall show in a future article.

" Before taking up farming, Mr. Barnard had been a soldier. He had obtained his infantry, cavalry, and musketry certificates. In 1866, he commanded the volunteer companies at St. Armand, and at Freligsburgh ; in 1865, he was at Niagara, in command of a strong detachment sent against the Fenians. In 1870, he was on the staff, as paymaster, a position he resigned to accept the post of emigration agent in Europe.

" Mr. Barnard was a man of superior mind. English by his father's side, on his mother's French-Canadian, he spoke both languages well. In appearance he was thoroughly English, but his heart was purely French-Canadian. He was a man of decided views, a rare thing nowadays ; a most perfectly disinterested man, which is a still rarer thing, perhaps. All his deeds were done for others, for his country, not for himself ; he died poor. He was a fine, distinguished looking man. (1)"

As we said just now, the author of the above did not consider the portrait finished. Regretting that his skilful pen never finished the work so well begun, we will try, rather photographically than artistically, to draw up a summary of the agricultural career of M. Barnard.

Farmer, journalist, lecturer, agricultural functionary, Mr. Barnard soon found out the necessity of supporting by practical demonstrations the theoretical teaching he proposed to disseminate throughout the province. It was to the realisation of this project, incessantly hampered by men no less than by events, but no less incessantly pursued with equal perseverance and personal sacrifices, that he devoted all his energy to, and consumed his strength in, the service of his country.

By recording here in broad lines that which Mr. Barnard carried out under these varied designations, we hope to give our readers an opportunity of appreciating at its true value the vastness of the labour accomplished.

(1) *La Verité*, Quebec, August 27th, 1898.

Leaving school at 15 years of age, Mr. Barnard passed a few years in a mercantile house; on reaching 21 years, he took a lease of a poor sandy farm at Three-Rivers, where he, not unsuccessfully, began dairying, especially winter butter-making; but the land did not respond to his application; it needed a great deal of imported manure to induce it to produce anything like a crop. Amid the troubles of his early start, the young farmer felt the ardour of the warrior stirring in his breast at the news of the Trent affair. We have already seen that from 1864 to 1868, Mr. Barnard was more of a soldier than a farmer.

Returning from Rome in 1868, and while busying himself with the organisation of the Pontifical Zouaves, he passed a short time at his farm at Three-Rivers, leaving it in 1869 for Varennes, where he established his model-farm under better conditions as to the fertility of the land, but very hard as regarded himself, on account of his lecturing tours throughout the province; his foreign missions, his inspections of agricultural and colonisation associations, his duties as director of agriculture and of the official Journal of Agriculture, kept him away from his farm, and compelled him to have recourse to paid men for the execution of work that seldom prospers except when done under the master's eye. In spite of the utility of the experiments proposed and carried out at Varennes having been acknowledged in 1879 by a decree in council, no grant in aid of his labours was made to Mr. Barnard, and they were all executed at his own proper expense.

Compelled to transfer to Rougemont. for a few months, the agricultural school he was organising at Varennes, he was called into residence at Quebec in the course of the same year.

From 1884 to 1888, Mr. Barnard once more began his agricultural demonstrations at Three Rivers, still with his own funds. In 1887, at Three Rivers, the first meeting of the Farmer's Clubs of the Province of Quebec passed a resolution: "That a provincial model farm, for the benefit of all the farmers that read the Journal d'Agriculture, be established, with a school of practice annexed." The project proposed that members of the clergy, specialists, be entrusted with this religious, patriotic, and thoroughly national work.

Recalled to Quebec in 1888, Mr. Barnard took with him the greater part of his herd of Canadian and Jersey-Canadian cows, which he kept at the Sacred Heart Hospital, where he pursued his inquiries into the economical production of milk in winter, until the farms of the Hospital were sold.

When the Farmers' Syndicate was organised at Quebec, in 1892, Mr. Barnard took on lease a farm at l'Ange-Gardien, near Quebec, with the intention of there carrying on his experiments, the programme of which, endorsed by the Farmers' Syndicate, was approved by the first Farmers' Congress of the Province of Quebec (3rd session, 1st resolution). It was on this farm at l'Ange Gardien that Mr. Barnard died, prematurely, on the 19th of August, 1898, without having the consolation of having realised the dream of his whole life.

Our readers already are aware of the manner in which the practical labours in agriculture of Mr. Barnard were greatly hindered, both by circumstances and events, the greater part of which were beyond his control.

By the study of his work as a publicist and his labours as a civil servant, it will be easy for us to show how the immense extent of his external work contributed to the financial failure of his practical work, which was so often and so unfairly thrown in his teeth.

Appointed in 1869, by the Council of Agriculture, as editor of the "*Semaine Agricole*," he saw, in 1870, that journal become, under his direction, the organ of the Council. Then was the time that he began that work of rehabilitating the Canadian cow, which he pursued throughout his life. If he had, at least, the satisfaction of seeing at last his endeavours in that sense completely successful they did not the less lead to the existence of great difficulties, which caused him in 1871, to resign his editorship: the paper ceased to appear in the following year.

In the interval, Mr. Barnard had been sent by the Quebec Cabinet on an important mission to Europe, there to study farming and its allied industries, for the benefit of the province, as well as to make known to the farmers of the old countries the advantages of colonisation in Canada. This tour did not interrupt his work as a publicist, for every week he sent home letters on agriculture, which were generally read. The report of his mission to the Quebec Government having been communicated to the Dominion Cabinet, a fresh mission was entrusted to him by the two, whence arose the first experiments in the growing of sugar-beets in this country.

It was at that epoch that, in spite of the handsome salary offered, he refused the post of emigration-agent in Europe, in order to return to his agricultural lectures in this province. In his campaigns, he became, with all the ardour of his convictions, the apostle of dairying and of the establishment of creameries and cheeseries. This crusade he carried on up to 1888 and 1889, into the most Northern parts of the province, as well as to Lake St-John.

In his earlier lecturing tours, he also inspected the agricultural and colonisation societies, and his report brought about several important reforms, at least in the colonisation societies.

In 1876, it was decided to establish the Official Journal of Agriculture, which the Council of Agriculture had never ceased to call for since the Semaine Agricole was abolished. At the recommendation of the Council, Mr. Barnard, appointed Director of Agriculture for the Province of Quebec, was also made Director of the Journal d'Agriculture, which he retained till his death. His work in this capacity is too well known to the farming public to need furthur comment.

In the intervals of his work, Mr. Barnard published, in or about 1874, *Causeries agricoles*, of which a second edition appeared in 1879, under the title of *Manuel Pratique d'agriculture*. In 1894, appeared the *Manuel d'Agriculture*

(for the use of the Farmer's Clubs), of which one of our former presidents said with truth, "that this book is the crown of his life of labour, spent in a struggle with routine, and in striving to convince our farmers of the true value of sound ideas on agricultural matters" (14th Rep. D. Ass., p. 87). We must also mention other works from the fertile pen of Mr. Barnard: In 1872, Memorandum on the creation of le Journal d'Agriculture; 1878, Eloge de l'Agriculture; this pamphlet which was "couronné" by the Institut Canadien at Quebec, contains a thorough study of the best means of improving Canadian farming, and was the starting point of the many improvements that date from that period; in 1881, a pamphlet on the production of meat, butter, and cheese in the Province of Quebec, which, at that time, only had 22 creameries, 140 cheeseries, and 5 combined factories. It is in this pamphlet that is found, if not the *fœtus* of our Association, at least the general temperature needed for its incubation; our annual reports, to which Mr. Barnard was subsequently to be the most authoritative contributor, were already mentioned in it. Mention is also made in it of the creation of a provincial dairy-school.

But these publications were not sufficient to exhaust the generous ardour of our Director of Agriculture. He was determined to put his ideas into working order. So, seeing in the grouping into bodies of the farmers the surest pledge of their prosperity, what zeal did he not expend in inciting them to enrol themselves in parochial farmers' clubs! And later, wishing to extend to the whole province the benefits of association, he took an active, if not a preponderant part, in the instituting of the Pomological Society, in 1878; of our Association, in 1882; of the Farmers' Syndicate of Quebec, in 1892; of the Silage society, in 1893; of the Good Roads society, in 1894, and of the Canadian Breeders' Society, in 1896. By examining the annual reports of these numerous associations, it is easy to appreciate the multiplicity and the diversity no less than the value of the multifarious contributions made to them by Mr. Barnard.

And to how many other branches of agricultural work did he not lay his effective hand? Was he not, with M. J. C. Chapais, our present Vice-President, the suggester and the chief cause of the opening of the dairy-school at St. Denis de Kamouraska, in 1881, the first of the establishments of this kind in America? In this affair, he had need of all his energy of conviction and of his zeal in argument to triumph over the resistance of influential persons among his friends, whose assent was indispensable to the success of the enterprise, but who were not as yet convinced of the certainty of success promised to the dairy-industry; as well as over the deeply rooted prejudices of those who were to be the patrons of the new establishment. This school, by the bye, was the first factory opened below Quebec.

Was he not also one of the first to moot the question of starting experiment-farms? Did he not, in 1884, lay the foundations of the "*Mérite Agricole*"? And of how large a part of the progress of agriculture was he not the initiator and the promulgator! Manure-cellars, siloes, economical farm-buildings, manufacture of drain-pipes, preparation of manures from apatite, ashes, etc., etc.

In undertaking so many and such varied labours, Mr. Barnard frequently exposed his robust constitution to rough ordeals. At two different times, at Rougemont and at l'Ange-Gardien, he had already experienced the attacks of over-work, which was slowly sapping his strength.

At the time determined upon by Providence, this valiant athlete fell, his arms, so to speak, in his hand. He had used the talents entrusted to him by his Master for the good of his country ; and he has found in Him, above, the reward that he sought in vain here below.

He has always kept in view the good of the agricultural classes ; may they worthily honour his memory by, at least, putting into practice his teachings and his example !

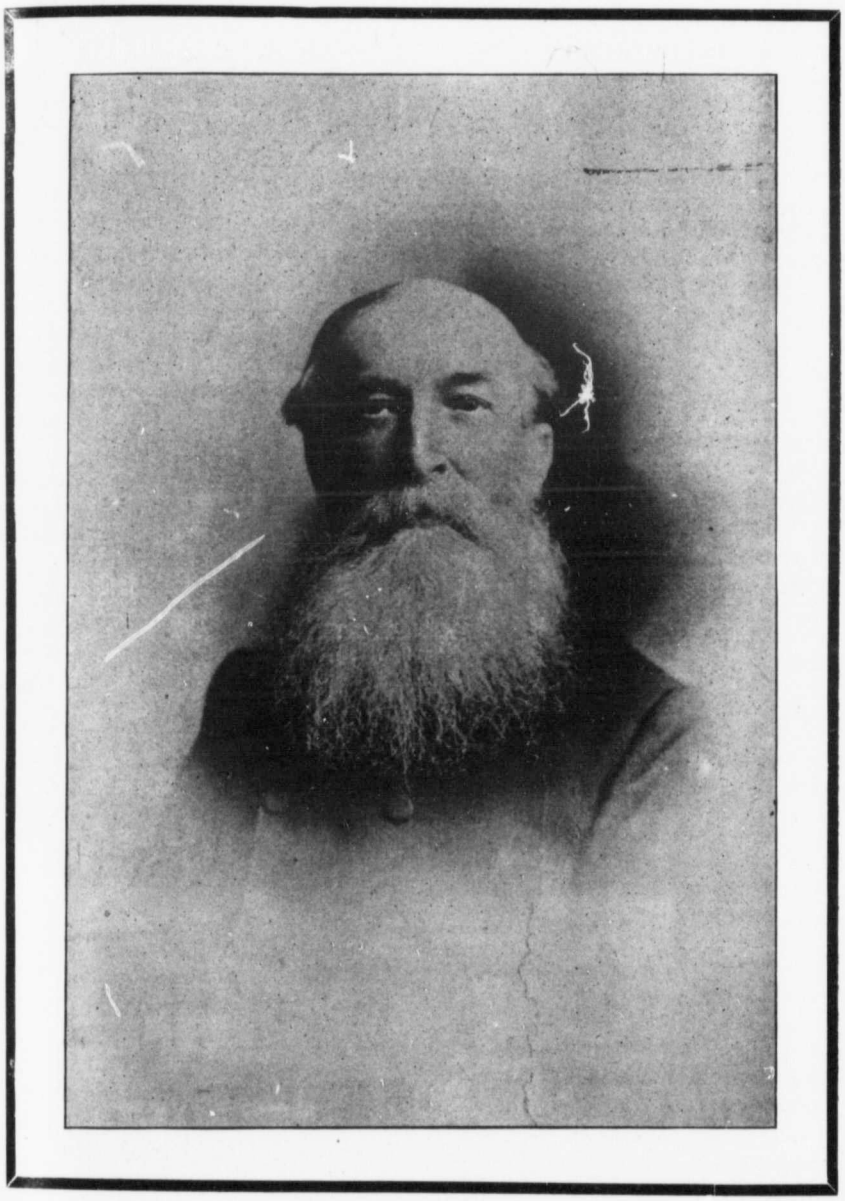
M. J. A. Vaillancourt—I have now only a word or two to say about our dairy-school at St. Hyacinthe. I trust it will continue to form good pupils, and I shall certainly be very sorry to hear that any one, pupil or inspector, does not turn out satisfactory. And I hope that if much is said in future about the school, nothing will be said but in its praise and commendation. Thanks, gentlemen, for your confidence ; pray believe that, aided by the board of directors you have just appointed, I shall put my shoulder vigorously to the wheel, and do my best to impel the chariot of the dairy-industry as rapidly as possible along the road of progress.

Mr. Fisher is about to address you ; I know that you are always happy to listen to him.

The Hon. S. A. Fisher—I desire, first of all, Mr. President, to congratulate you on the honourable position you have been chosen to fill ; and I must also congratulate this Association on the fortunate choice it has made of a man so capable and energetic as you. The President of the Dairymen's Association occupies a position full of responsibility; the title is not honorary, but the position demands a vast amount of work from its occupant, and I know that M. Vaillancourt will employ all his powers to further the progress of dairying in our fine province.

I wish to say a few words this morning on the liberal proposal made to you yesterday by the Hon. the Commissioner of Agriculture at Quebec, in offering to the cheeseries a grant for the purpose of improving the ripening-rooms. I must tell you, frankly, that if all is not perfect in the making of cheese in Canada, the defects are chiefly to be found in those rooms.

I visited England last summer ; you know how good the position and reputation of our cheese are in the English market. Well, I was surprised to hear the dealers and importers in England complain, for the first time for many years, of the quality of Canadian cheese. This is a very curious matter ; for many a day Canadian cheese has enjoyed the brightest reputation in England ; but if we allow this reputation to be tarnished, we shall find our cheese hard to get rid of.



ED. A. BARNARD.

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Many dealers in England told me that our cheese had heated this summer in the ripening-rooms. I was not surprised to hear it, seeing that I knew that many of these rooms are not built as they should be. I am therefore rejoiced to hear that the Quebec Cabinet is going to encourage the proprietors of cheeseries to improve this part of their factories.

In a good ripening-room, the temperature should be absolutely under control. It was discovered some time ago that the best temperature for ripening-rooms is from 60° to 65° F. ; and yet I am sure that in most of our factories the temperature in summer rises as high as from 75° to 80° ! Every time the temperature reaches such extremes, your cheese is in danger, and in the majority of cases, it is damaged. If cheese is to ripen properly, the temperature desired must be always kept to ; it must be completely under control, and the same plan of building that serves to keep the temperature low in summer, will keep the building warm in spring and autumn.

In order to secure this, the walls of the ripening-rooms must be better built than they usually are. They should be made of two boards outside and the same inside, so that neither the heat of summer nor the cold of spring and fall can penetrate into the ripening-room. A ripening-room should be built something like a refrigerator, though perhaps it does not need quite so much nicety of construction. And the more perfectly you can control the temperature of your ripening-room, the better will you succeed in your cheese-making. I give you this advice as being absolutely necessary, for unless you have ripening-rooms of such construction as that I have described, you will fail to keep the position your cheese now occupies on the English market.

You have, here present, M. Gabriel Henry, the Engineer of the Quebec Department of Agriculture, who has studied this question, and is ready to impart all necessary information to such proprietors as shall be desirous of improving their ripening-rooms.

Our cheese-trade has another danger to dread, on which I think Mr. Vaillancourt said a word or two last night ; we send off our cheese too green. If you do not want your cheese to heat during the voyage, it must positively be well-ripened before it leaves the factory.

Still another danger, and this it is my business to provide against as far as possible ; it is this : on the vessels that take our cheese to England, the hold, in summer, gets hot. To avoid this danger, I have made arrangements with the different steamboat companies to fit up systems of ventilation, in the holds of their boats, which will admit the external air, and prevent the cheese from heating. This ventilation was needed, not for the cheese alone, but also for apples and other fruit. These arrangements were first put into operation this fall on the greater part of the vessels belonging to the different companies. Next season, all the large steamers going from Montreal to England will be fitted up with this apparatus, and thereby a great danger to our cheese will be avoided.

Now, the government has done its part, and it is your duty, you, the makers and the proprietors of factories, to improve your ripening chambers,

for I must tell you plainly that if you do not, you run a great risk of no longer obtaining so good a price as formerly for your cheese on the English market.

There is another thing, closely connected with dairying, that I want to talk to you about this morning: the breeding of pigs. We have lately acquired a great and valuable experience in this business, namely, that whey, with the addition of certain other matters, is a capital food for pigs. Certain kinds of grain must be given. Corn must never be used with whey, but it is very useful to mix with skim-milk. Beans, not corn, and pease-meal or some other grain rich in nitrogen, should be added to whey.

If you want to make export-bacon, a trade that is of great importance, at present the leading article of our agricultural produce, you must push your pigs along quickly; that is, they must not exceed 9 months in age, and weigh about 200 lbs. when slaughtered. It pays better to make bacon thus with small pigs, than pork with big hogs: you will get higher prices for them. The pork-trade is now utterly unlike what it used to be. What is wanted is a small hog of 175 to 200 pounds; not too fat, but rather lean; and it is not for salt-pork that pigs are sought after. The hog must be long and deep, because if the pork is too thick on the back, the export-trade will not take it. To make the sort of meat the export-trade wants, the hogs need exercise. Get them out of doors, and give them every chance to take plenty of exercise, adding, of course, plenty of sound food. Pasture is the thing for pigs that are to be made to pay. While the little ones are growing, put them on the land and let them run about. The best pasture for pigs is tares and oats, or some other mixture of grain and pulse. If you want to breed pigs in the winter, you must give them a good roomy covered court, warmish, but not too warm, so that they may have plenty of space to run about in. You ought to have pigs for sale in every month of the year. At this time of year, hogs are seldom worth more than 4 to 4½ cents a pound, live-weight, but in July and August, they will fetch 5½, 6, and perhaps as much as 7 cents.

It is just as easy to breed pigs in winter as in summer, if you take due precautions; but, for the bacon-trade, you must have the same number and the same quality of swine every month of the year. As things are now, there are always rather too many in the fall, and not enough at the other seasons of the year. If you mean to make money by pigs, you must have some to sell every month of the year.

Mr. Macpherson, I know, spoke to you about this trade yesterday afternoon. I can tell you that the bacon-trade is one of the most important of all the trades carried on now in Canada; and it is so intimately allied to dairying, that it is almost indispensable to the profitable carrying on of the latter.

I desired, gentlemen, to offer these few ideas to the makers and farmers present, because I felt assured that the two questions I have treated are of the highest importance, and require the whole of your experience and energy to be devoted to them.

I thank you very much for your attention; I trust that in the course of the coming year we shall find a great improvement in the dairy-industry. Thanks, Mr. President; thanks, Gentlemen. (Applause).

REMARKS BY MR. H. S. FOSTER.

Dairying in our province is now passing through a crisis that demands instant attention, not only from those specially engaged in it, but also from all those who have interests at stake in this province, be they dealers are financiers. Dairying is the sole and the most important trade to which our farmers can devote themselves. Well managed, it will make the farmers prosperous, and by that means ensure the prosperity of all the manufactures and trades of the country. Since it has been proved to demonstration, that we can make here butter and cheese of the very finest quality, the development of this important trade depends entirely upon our skill and management.

The first, and the most important point of all to be considered, is the proper arrangement of our creameries and cheeseries. This is the key to the whole situation, for we can produce as good milk as any country in the world. The *making* is then the sole difficulty. In the circumstances we are now traversing, I appeal to the good will of merchants and capitalists who are interested in this province, to invoke their assistance in persuading the patrons and the makers of cheese to organise themselves on a footing capable of justifying the employment of a capital of from $5,000 to $8,000, to be expended in the construction of combined butter and cheese-factories, provided with good ripening-rooms, with refrigerating rooms, and with all the apparatus needed to make the very finest butter and cheese.

The first thing to be considered is the selection of a site for these factories, each of which ought to receive the milk of at least a thousand (1,000) cows. By the selection of a central place, it would be easy to draw the milk from a distance of from 6 to 8 miles, and even more, by rail. This would impose the cartage on the company. We must not forget that we can do this as cheaply as it is done in other countries, where this system has been practised for many years, to the great advantage of the farmer-patrons. In Denmark, all the milk is thus carted, and it is to this system that the Danes attribute their success in dairying, for it is thanks to their large factories that they have been able to employ true experts to make their butter, as well as to lay out the sums necessary to place their factories on the best possible footing. This combination of creamery and cheesery is the question of the day ; for there is an unlimited demand on the market for choice butter, and these combined factories can work on throughout the year, making cheese in hot weather and butter during the rest of the year ; or making, indifferently, that article which is most in demand.

In order to make dairying as profitable as possible, farmers ought to contrive to prolong the period of lactation of their cows as much as possible. This can be done in this province by care and good food, for our climate admits of the growing of maize, with which silage is made at a cost within the reach of every one. If we have creameries that can work throughout fall and winter, our farmers will soon find out that it is infinitely more profitable to derive from the cow a return sufficient to pay liberally for her keep in the cowhouse, than to winter her, as they have been in the habit of doing, at their own proper cost.

The truth is, that, if we mean to enjoy prosperity through dairying, we must positively organise ourselves on a different basis than that of the past, and as, after ten years more of consideration, farmers and those directly interested in the trade, do not seem to feel the necessity of an alteration, and of adopting the principle of combination, so as to ensure the production of an article of the best quality and of greater uniformity, I come here to-day to appeal to merchants and those interested in the financial prosperity of our Province, and to ask them to come to the front and organise a few of these combined factories, so as to give an object lesson to the farmers, in order to convince them at once of the sort of madness it is for them to practise dairying by sending their milk to factories such as are constantly met with from one end of the province to the other.

Milk can be carted, by contract, for a dollar a ton. No farmer can sacrifice his time at that price for carting his milk; but we have to educate farmers on this point that we may convince them that it is to their advantage that the entire milk produced within a radius of at least six miles be concentrated in one single factory, so as to justify the erection of a first-class factory, and the employment of expert makers.

All depends, indeed, upon the scale on which the company is organised, as it is in all lines of business and manufactures, that realise and pay their shareholders good dividends. Allow me to give you an instance of the benefit derived from organising a company on a footing sufficient to provide good buildings and good makers. I mean the combined factory of Black Creek, situated near Stratford, Perth, Ont. In the cheese season, this factory turns out some 60 cheeses a day. Mr. Andrew Clements, of Glasgow, told me he was paying for the cheese of the factory 1½ cents more than the highest maket-price. This, I hope will convince you of the benefits of the kind of organisation I advise you to adopt; the extra price of the product would of itself provide for the cost of carting the milk and of the making of the cheese.

There is another point to which I am anxious to draw your attention: the rate of freight we have to pay to Montreal on butter and cheese. I have prepared a table of the charges and distances, so as to show you at a glance the unfairness of the present tariff, and of the necessity of at once establishing rates proportional to the distance. The farmers of the New England States, who were suffering a like injustice, took the question seriously to heart, and, organising themselves, obtained, from their respective governments, the creation of proportional rates of charges for freight.

Here is a table, in which I have tried to show some of the most salient of these anomalies:

COST OF FREIGHT FOR BUTTER AND CHEESE PER 100 LBS., FROM THE FOLLOWING STATIONS TO MONTREAL.

CANADIAN PACIFIC				GRAND TRUNK.			
Stations.	Distance from Montreal.	Butter. cts.	Cheese. cts.	Stations.	Distance from Montreal.	Butter. cts.	Cheese. cts.
Kingston	**212**	**18**	**15**	**Kingston**	**174**	**18**	**15**
				Mallorytown	138	18	12½
Brockville	155	18	12½	Brockville	125	18	12½
Prescott	130	18	12½	Prescott	113	18	12½
Avonmore	73	18	10	**Cornwall**	**67**	**14**	**10**
St-Polycarpe Junc.	40	14	10	**Coteau Junc**	**37**	**14**	**10**
Montreal	O	"	"	Montreal	O	"	"
Versailles	**37**	**17**	**11**				
L'Ange Gardien	**50**	**21**	**14**				
St-Hyacinthe	69	13	10	**St-Hyacinthe**	**36**	**13**	**10**
St-Hugues	83	23	15				
				Upton	48	13	10
Cowansville	**57**	**21**	**14**	Danby	**62**	**16**	**13**
Foster	**70**			Richmond	76	17	**12**
Sherbrooke	**108**	**18**	**14**	**Sherbrooke**	**101**	**18**	**14**
Cookshire	**128**	**21**	**18**	**Coaticook**	**122**	**20**	**16**
Champlain	107	17	14	**Arthabasca**	**108**	**21**	**15**
Ste-Anne	119	17	14				
Bélair	159	18	15	Chaudière Junc.	**163**	**23**	**17**
Quebec	**172**	**18**	**10**	**Quebec**	**172**	**18**	**15**

You see that if Quebec enjoys on the two lines, the G. T. R. and the C. P. R., a rate equal to that from Kingston; Cornwall, which is 67 miles from Montreal, has a tariff equal to that from St-Hyacinthe, which is only 36 miles off, as well as a rate very much less than that of L'Ange Gardien, Rouville, and Cowansville, that are less distant from Montreal. Thus, too, we find that Sherbrooke pays obviously the same rates as Kingston, which is twice as far from Montreal, and Chaudière Junction, 50 miles nearer than Kingston, pays a higher rate. It is not necessary to insist on the flagrant unfairness of these rates, and I trust that you will get up an organisation, as our cousins in New York did, to induce the railway companies, by the influence and interposition of our rulers, to alter these rates in your favour.

AFTERNOON SESSION OF WEDNESDAY, DEC. 7TH.

ADDRESS OF M. G. A. GIGAULT,

Asst. Commissioner of Agriculture.

Mr. President and Gentlemen,

This year, the exports of cheese to England have decreased. Mr. Lister, an Englishman, who was present at this meeting, tells us that, whereas, the consumption of cheese in England has decreased, the consumption of butter has increased. He, therefore, advises us to turn our attention specially to the production of butter. According to his views, if we were to make twenty times our present production of butter, it would not lower its price by two cents. We must pay great attention to this advice of Mr. Lister.

Besides, we should do our best to expand the demands of our home-market. If the exports from the States of cheese have decreased, it is not only because we make better cheese than they do, but also because their people eat a great deal more cheese than formerly. When MM. Bourbeau and Henry visited the Western States, they found that the people were using a great quantity of a new kind of cheese, called "Brick-cheese." It seems that it pays better than Cheddar, and might easily be made here, especially in winter, if the Dairy-school were to take up its instruction. It is to be hoped that our makers will turn their attention to the making of "brick-cheese" this winter. The paper, *Farming*, of Toronto, has just published an excellent article, in which it strongly recommends dairymen to pay great attention to the demands of the home-market, and to endeavour to increase the consumption of dairy-products.

There is no good in dreaming of increasing our exports of cheese, but, on the other hand, as the production of milk has increased and is still increasing considerably, we have got to find profitable markets for our dairy-products, either by expanding our butter-trade, or by making such varieties of cheese as shall be more suited to the taste of Canadian consumers than the cheese we are now turning out.

The facts that look us in the face show that the competition in the English market is becoming annually more intense. They who will finally win in the contest are those who will learn how to produce the best articles at the most economical rate. It is to the quality of our exports that we must look, if we do not wish to see our dairy-trade go to pieces. Nothing but the production of first-rate commodities will save us. And to succeed, the first thing necessary is that our farmers supply the factories with milk in the best possible condition; for, unless it is delivered perfectly clean and pure, good butter and cheese cannot possibly be made from it. The makers, too, must be skilful and the factories well fitted up. A good ripening-chamber, also, is requisite, and the Minister of Agriculture is about to take measures to encourage the improvement of these chambers.

That the trade be profitable, it is indispensable that the milk be produced economically. On this point, Mr. Macpherson has given us valuable hints. In his opinion, milk could be produced for 25 cents the 100 lbs., if we knew how to improve our pastures and meadows, and to improve the productive powers of our farms so as to enable them to yield abundant crops of green fodder.

The selection, or weeding out, of our herds of cows is one of the best means of lowering the cost of our milk. With the view of encouraging this selection, the Hon. the Commissioner of Agriculture wishes the Clubs and Societies to organise competitions of milch-cows, in which nothing shall be considered but the yield of milk. Registers will be furnished, and a special grant will be made to such agriculture societies as shall offer the highest prizes at these competitions in each county.

In Germany, an experiment has been made on 60 cows of the same breed, and receiving the same food. It was shown that the annual yield of cows of the same breed, etc., may vary by as much as 216 pounds. The best cow gave, in a milking period of 300 days, 350 pounds of butter, while the worst only produced, in the same period, 174 pounds. This fact shows how necessary it is to select our milch-cows carefully.

And, as to the bye-products of our dairies, Mr. Macpherson told us just now how important it is for the dairy-farmer to breed plenty of pigs. This is well understood in Denmark, the farmers of which country sell more than ten million dollars' worth of bacon annually. This is the best way of making the most of our skim-milk and whey. The fattening of hogs after the fashion prescribed by Mr. Macpherson would constitute a new source of profit for our dairy-farmers.

We occupy, at present, an excellent position as to the reputation of our goods on the English market; and this position we may maintain, and even improve, if we set to work to put into practice the good advice given to us by the lectures we have listened to at this convention.

LECTURE BY M. GABRIEL HENRY.

B. Sc., M. Can. Soc. C. E.

ON RIPENING-ROOMS.

Mr. President and Gentlemen,

A great many cheese-makers imagine that their work is finished as soon as they find that their curd has no bad smell, and that it leaves the press after having assumed the shape of a cheese of good appearance.

If, in all the countries that compete with Canada on the English market, this notion prevailed generally, if consumers as well as dealers held the same

opinion, the importance of the subject I am called upon to treat before you, would be null. But, unfortunately, it is not so, and the cheeses once out of press and transferred to the ripening-room, suffer; under the influence of atmospheric agents, the temperature, the moisture of the air, and of the innumerable germs that are invariably therein contained; rapid transmutations that render them irrecognisable (1) by the taste at the end of a few days.

By these interior transmutations the curd becomes cheese. If they were not held in check by some means or other, a bad flavour would supervene, the cheese would lose weight, the exterior change its look, and an article would reach the market which the consumers, and therefore the dealers, would either reject altogether, or would only buy at a reduced price.

All the efforts of the patrons to supply good milk, and of the makers to produce good curd from that milk, would be absolutely nugatory, and if such goods are made generally in a country that supplies the market, that country would soon see itself evicted from that market by competitors who understand business better.

If, in this province, the importance of good milk and of a good system of making is partly understood, the value of proper ripening is not, as yet, appreciated. Nothing, or hardly anything, has yet been done either by the factory-owners or the makers, to improve this so important part of cheese-making, and if those interested do not take care, the cheese-trade of the province will before long be seriously compromised. The exceptional heat of the past summer has developed the importance of this fact sufficiently to render it quite unnecessary to insist at length to-day on this subject; so I will at once enter into the theoretical and practical considerations, on the construction of good ripening rooms, without which the proper ripening of cheese is impossible.

There are many things that affect the ripening of cheese. They are: (2)

1. *The number and kind of the germs it contains*—These germs proceed chiefly from the milk employed in the making. Dirty milk will always introduce bad germs, that will induce bad secondary fermentations.

2. *The cleanliness of the factories*—In the air of dirty factories, there are always in suspension bad germs that fall into the curd while working; they become incorporated with it, and develop there during the time of ripening.

3. *Want of cleanliness in the vats and utensils that are used during the ripening of the cheese*—By this neglect, bad germs are again introduced into the curd.

4. *The degree of humidity of the cheese, its acidity, compactness, etc., which again have great influence on the development of the ferments acting during the ripening period*—These things ought to be known to every good maker,

(1) I fear this word is a "coiner"! A. R. J. F.
(2) Cheese, plural cheeses, please. A. R. J. F.

who should consider as one of his essential qualities a holy horror of bad microbes. They (the degree, etc.,) do not enter into the case of those I wish to treat to-day, and which are:

1. The length of the ripening-period.

2. The temperature of the ripening-room.

3. The quantity of moisture contained in the air of that room.

4. The smells that pervade it, and its cleanliness.

5. The constant renewal of the air in it that must be observed.

It is to these five last too much neglected points that I now wish to draw your attention, while treating of the construction and ventilation of the ripening-room.

There are on this subject several facts only lately acquired, on which our basis must be laid.

It is now generally admitted: 1. That ripening is chiefly carried on during the 10 or 20 days that succeed the cheese leaving the press. Cheese, therefore, must not be carried about during this period, if it is not desired to arrest its ripening, and its sale must not take place before it has acquired all its best qualities.

2. That when the temperature during ripening exceeds 70° F., the quality of the cheese suffers greatly.

3. That cheese can be ripened at a temperature relatively low (below 60°), without losing either texture or flavour.

4. That cheese, kept at a relatively low temperature, ripens more slowly but more surely, and ends by becoming better than cheese ripened at a relatively high temperature.

5. That, in spite of this, cheese put, immediately after leaving the press, in a low temperature, is liable to acquire a bitter taste.

6. That when the air of the ripening-room is too dry, the cheese loses a good deal of weight and ripens badly.

7. That sudden variations of temperature prevent the perfect ripening of cheese.

8. That currents of air—draught,—passing over ripening cheese injure it.

9. That damp and unrenewed air favours the development of mildew and bad smells.

A well planned ripening-room, then, should secure.

1. A constant temperature in-doors, in spite of the variations of temperature out of doors: the most important point, of all.

2. A sufficiently low temperature.

3. A proper degree of humidity.

4. A quiet but continuous renewal of the air in every part of the room, but without draughts.

The temperature of exterior air in this province is very changeable, and very great variations in it from day to day may occur. Now, the exterior variations of temperature may make themselves felt in the ripening-room in two different ways.

1. By conduction, convection, and radiation of heat.

2. By the renewal of the air.

The explanation of this phenomena is as follows:

Boiling water is put into a vessel of cold iron, for instance; at the end of a few seconds, the vessel cannot be held in the hands without burning them. The heat is then said to have passed through the sides of the vessel by conduction. Had this vessel been of wood, the heat would still have passed, but much more slowly, and it would be said that wood is a worse conductor than iron; lastly, if this vessel were placed in a wooden box, and surrounded by sawdust, the heat would take a considerable time in passing through the sides of the vessel, the sawdust, and the sides of the vessel containing them.

The nature, then, of the sides has great influence on the ease with which heat passes through them.

Instead of the sides of a vessel, we may look at the walls of a ripening-room and the action will still be the same. If the temperature is higher out of doors than in the room, a certain amount of heat will pass through the walls by conduction, from the exterior to the interior, and the quantity of heat thus passed will depend upon the extent of the walls and their nature. The quantity of heat that traverses a wall, per square foot and per hour, depends not only upon the conductive power of the wall, but also on the difference of temperature between the external and the internal air: it will be proportional to the difference. Thus, if the interior temperature be 60° and the exterior 80°, one-half more heat will pass in the same time than if the temperature were 70°; for the difference between the exterior and interior temperatures would be, in this latter case, 10°, instead of 20°, as in the former, i. e., twice as much.

The quantity of heat that traverses a wall depends again, not only on the conductibility of the wall and on the difference between the external and internal temperatures, but on the facility with which it is carried to the wall by the surrounding air, and then with the ease with which it can penetrate the wall from without and enter the interior of the room through it. I must call upon you to attend seriously to this point, which is generally misunderstood, as much so when the object is to arrange cooling or heating apparatus, as when ripening-rooms are the points to be considered.

Although a wall may be a very good conductor of heat, if heat be not placed within its reach, and if the heat that is placed within its reach be not able to penetrate it or leave it, it will not pass through it, never mind how great may be the conductive power of the wall for heat.

The quantity of heat that can pass through a wall depends, then, on two principal things that I proceed to explain to you.

Here come in two terms: convection and radiation. The heat that penetrates a wall comes, first of all, from the layers of air in immediate contact with it, so that when the heat of the thin layer that touches it shall have penetrated it, if the air is at rest, the heat from the neighbouring layers can only reach it by traversing, by conduction, the thin layers next the wall. Now, air at rest is a very bad conductor of heat; consequently, the amount of heat that can reach the wall will be but trifling. But, if the air is briskly agitated against the wall, the phenomena will be reversed, and the fresh quantities of heat will be continuously borne to it by the layers of air that successively come in contact with it. It is then said that heat is transmitted to the wall *by convection*. As I will show before long, convection is a phenomenon that plays a great part every time that the transmission of heat is concerned, particularly in the case of the walls of ripening-rooms.

Convection it is that explains why walls exposed to the dominant hot winds allow more heat to pass than do others. The same things happen inside the rooms, and if the air there circulates in eddies along the walls, the heat can all the more readily penetrate.

Heat, again, can penetrate or escape from a wall by what is termed radiation and absorption. If you place your hand at a certain distance from a vessel of hot water, a lamp, or a hot stove, you feel the heat, and that heat is said to be emitted by the lamp and transmitted to the hand by radiation. Heat from the sun reaches by radiation through the celestial regions. A wall exposed to the solar rays will evidently receive by radiation much more heat than a wall that lies in the shade. This is a well known fact, by which we must profit, as we shall see further on.

But the radiant heat falling thus on a wall is not all absorbed by that wall; the proportion that is absorbed depends greatly on the exterior surface of that wall. A well polished, brilliant surface, of a very light shade of colour, will admit the radiant heat into the wall with much less ease than a rough dark-coloured surface. This is an experiental fact. A wall, with a perfectly smooth, brilliant surface, would be almost impermeable to radiant heat. In the interior of the room, the phenomena are still the same, and the heat is not emitted with equal facility by all kinds of walls. If a wall is very smooth and white in colour, it will less easily emit heat by radiation into the interior of the room, than if it were made of unplaned wood and painted black.

The practical conclusions deducible from these considerations are the following:

1. In building the walls, use materials of bad conducting power.

2. Use these materials in such a manner as to diminish as much as possible the conductivity of the wall.

3. Lessen as much as possible the extent of surface of the walls and ceiling of the room, and, above all, expose as small a part as possible of that surface to outer atmospheric action.

4. Have the room with such an exposure (1) that the smallest possible part of the walls be open to the sun and the dominant winds; plant trees near the factory to cast a shade and to mollify the force of the wind.

5. Never place the ripening-room in the garret of the factory, where it would be at the mercy of the winds and sun.

6. If there is a garret above the ripening-room, ventilate it so that the heat shall not accumulate there, but not so as that the air be too vigorously agitated, in order not to favour the passage of the heat by convection towards the interior of the ripening-room through its ceiling.

7. Outside, use well-planed wood, painted white; and inside, too, the same.

8. The sashes allow a great deal more heat to pass by conduction than the walls, and that not only when they are in full sunshine, but when they are in the shade as well. Besides, they allow the radiant heat to pass through directly.

A square foot of glass will admit ten times as much heat, in the same time, as a square foot of the wall of an ordinary building. Consequently, the size of the sashes must be diminished as much as possible, and as light is wanted in a ripening-room, it would be better to have several small windows placed so as to throw a moderate light all over the room, than to have one or two large windows.

We know that a layer of air at rest is a very bad conductor of heat; therefore, could we solidify air and make it into walls for the ripening-room, these rooms would have a constant temperature; but if this is out of the question, the difficulty may still be overcome. Spaces filled with air may be contrived in the interior of the walls, and manage it so that the air in these spaces may be as nearly as possible in a quiescent state.

The best way to do this would be to make the walls of alternate layers of air and 1 inch to 1½ in. boards. For instance, the frame may be made of 2 x 6 studding, and then on each side of these may be placed a rank of boards, then on the boards a rank of felt-paper, very impervious to heat. Next, on the outside, on the facing of the boards, nail vertically, and at intervals of two feet from one another, strips or laths, 1 to 1½ inches in thickness, on which lay two ranks

(1) *Orienter*, is, to coin a word, to "eastify" anything. In England, an "orientator" is an instrument by means of which the name of the Saint to whom a church is dedicated is discovered, by finding on what day of the year the sun rises at exactly that point of the heavens opposite to the centre mullion of the East or Chancel window. A. R. J. F.

of inch-boards, interposing two thicknesses of paper. If the exterior rank of boards be tongue-and-grooved, it may suffice to place on the inside, on the first facing, two layers of paper, and finish off the paper with a facing of planed boards tongue-and-grooved. The construction of walls may be varied according to whether or no they will be subjected to the rays of the sun or to the dominant hot winds. By the above method, there will be, on the inner side of the wall, a space of 6 inches filled with air, and on the outer side, a space of 1½ inch.

But under the influence of the variations of temperature, the air eddies round in these air-spaces all the more rapidly the larger they are, and this increases the transmission of heat by interior convection. To remedy this sawdust used to be employed, and still is, to fill up the vacant spaces ; for sawdust, if it is not packed, encloses in its interstices an immense number of little vacant spaces in which it is impossible for the air to eddy. But, after all, the sawdust will get packed sooner or later, the spaces will be clogged, and the effect greatly diminished. It is the same with the husks, or glumes, of grain.

At present, the favourite plan is to put nothing in the vacant spaces, but not to allow them more than an inch and a half of width ; for then there is very little eddying of the air, and the desired effect is attained.

To prevent the re-entrance of the air into the interior of the walls, a bed of sawdust or of mineral wool, six inches thick, is placed on the sill, at the foundation of the building, and on the whole of its circumference, for it is from below that the access of air is the most easy.

One means that can be recommended for the diminishing of the eddies of air in the interior of the 6 in. space between the studdings, is to nail vertically on the interior parts of each studding, and following their axess, a 1 or 1½ thickness of laths or strips, on each side of which a rank of boards is to be nailed. The interval of six inches would thus be divided into three layers of air from 1 to 1½ inches thick.

By following the principles I have laid down, ripening-rooms can be built economically, in which the variations of temperature occurring out of doors can be rendered hardly perceptible, if the room is kept shut up.

But we saw that, to attain to a good degree of ripeness, we must be able to :

1. Renew constantly the air in the room.

2. Maintain a suitable degree of humidity. Now, the introduction of a certain quantity of warm air into a ripening-room, not only warms its temperature, but also dries the air in it.

In order to keep up the coolness of the room while renewing the air, there are two kinds of means :

1. Those which introduce the exterior warm air, and cool the interior air in proportion to the degree it is warmed by the entrance of air.

2. Those which only introduce cold air.

3. Mixed methods composed of the preceding two.

The means of the first lot have not, generally speaking, produced good results, either as regards humidity or heat. People used to water the room to cool it, or they placed ice in flat pans of water, or let water drip on cloths hung up in the room for the same purpose. These contrivances only gave passable results in places where the exterior variations of temperature were trifling, where the walls of the room were sufficiently impermeable to heat, and where the renewal of the air was limited, and even then, by these means it was impossible to keep the air in the room at a proper degree of moisture.

The second lot of means have, at present, given better results, but they require a certain expenditure of money to install the special apparatus or a provision of ice.

The first condition of success in both cases is, that the ripening-room be, first of all, not only impermeable to heat, as I said just now, but also air-tight. The door and windows must shut close, and air must be stopped out from every part except where special openings, that can be shut or closed at will, are left ; these openings being connected with the cooling apparatus, if one is employed.

The apparatus for cooling and renewing the air of the ripening-room, and keeping up the proper degree of humidity, is composed of two distinct essential parts :

1. The air-shaft.

2. The foul-air-shaft.

3. The apparatus, properly so called, in which the air is cooled.

As to the foul-air-shaft, I need only say that it should be wide enough. It should have a section of 1½ to 2 by 2, or 3 to 4 feet square, for a ripening-room of average dimensions, and connect with that room by several apertures just under the ceiling, and in different points in the room.

Each of these apertures should have means of closing, so that the draught may be suited to the need of it. The height of the shaft should be about 25 feet from the ground.

As to the means of cooling the air and of giving it the proper degree of moisture before its introduction into the ripening-room, there are several of them. The best known, are the "sub-earth-ducts," the description of which, in detail, has been given in the Journal d'Agriculture and in the bulletin published by the Department of Agriculture ; then, there are the ice-cylinders now employed in many factories to cool the butter store-room.

I am convinced that the first step to be taken in the improvement of our ripening-rooms for cheese, is to preserve them from the variations of temperature by thorough good construction of the building ; and that is why I have so firmly insisted on this point to-day. In badly built factories, no cooling apparatus has a chance of success. So, I will not keep on about apparatus for cooling the air.

The need of these apparatus is established, and doubtless before long the trade will place cooling apparatus at a moderate price before the proprietors of factories.

Will it pay to expend the sums necessary to the arrangement of a good ripening-room?

Such is the question frequently asked, and to which the answer is: Yes. Experience, wherever it has been tried, proves it.

In the first factory that made the "sub-earth-ducts," in Wisconsin, the apparatus cost $104.00, plus the digging of the trenches for the underground conduits, which was done by the patrons.

It was calculated then in that state that the average loss of weight in cheese while ripening was 3½ per cent. in 15 days. With the apparatus, the loss was reduced to 1 per cent. on an average, which makes a gain of 2½ per cent. of cheese in a fortnight, or 15 lbs. in 15 days, for a lot of 600 lbs.

As all the cheese has to pass through this room, it is clear that this apparatus pays well.

Besides, in cheeseries thus furnished, the cheese ripens more regularly, retains its shape better, and thereby fetches a higher price.

With a well-built ripening-room, the first condition of success, it may safely be said that the purchase of such an apparatus is laying out money at a high rate of interest.

My aim, in this lecture, has been to insist on the first step to be taken in the improvement of ripening-rooms in cheeseries; I have tried to do it as clearly as possible, and it only remains for me to thank you, Mr. President, and gentlemen, for your favourable attention.

LECTURE BY M. O. E. DALLAIRE,

Secretary of the Provincial Commission of Agricultural Merit, and Official Lecturer.

Mr. President and Gentlemen,

It is a pleasant thing for me to have to respond to the kind invitation of our devoted Secretary to address to you a few notes on *Economy in the production of milk.*

This subject is indisputably of the greatest importance; but specialists have so often treated it at our meetings, with much more skill than I can pretend to, that I will limit myself to giving you an abstract of the things I have learnt from their interesting labours.

I can also, with great advantage, avail myself of the experience of a numerous company of good farmers, *laureates of agricultural merit*, and others, whom I have consulted while visiting the farms entered in the provincial competition.

As our dairy-industry has to compete with that of other countries, we cannot keep the farmers too much on their guard, for they, after all, are the most interested of all classes.

Not only must each farmer take pride in supplying the very best milk, but it is also to his greatest interest to encourage every possible means of getting all the other patrons to do the same, unless he is prepared to see his own praiseworthy efforts come to naught.

Besides, each individual should strive to put into practice the now well understood means of *lessening the cost of producing milk.*

These principal means, and they are worthy of being repeated here to-day, are the following :

1. Proper rotations for dairy-farms.

2. Careful treatment of pastures.

3. Subdivision of pastures.

4. Green-fodder crops.

5. Water, salt, shelter for cattle, and other special treatment, such as gentleness, exercise, the way to milk properly, etc.

6. Proper mode of wintering stock.

7. Prudent practice of silage and its positive advantages.

8. Roots, and their judicious expenditure.

9. Utility of the chaff-cutter for rough-fodder.

10. Grinding (or bruising) grain for milch-cows.

11. The maintenance of ratio, and its proportionate production for each head of stock.

12. Proper care of cowhouse,stable, etc.

13. A convenient and fair-sized piggery.

14. Especial attention to selection of cows.

Each of these means would supply the subject for a very interesting lecture; but I must observe that most farmers are now acquainted with all these improvements.

People know, with more or less certainty, what there is to do ; still, it is a very different thing to say that they all do their best to put what they know into practice.

So true is it that our weak human nature too often neglects the very most important of all things.

Still, I will make some remarks on the *system of cropping.*

How comes it that there are farmers who keep with profit one head of stock to 2 or 3 arpents, *i. e.*, 30 to 40 head on the 100 arpents, while the majority only keep one head to the 5 and even 10 arpents ?

How comes it that those who keep the fewest cattle are those who have the most trouble with them ?

It is because dairying ought not to be a secondary part of the business of the farm.

As Shakespeare says, *to be or not to be* ; since cattle are indispensable on a farm, let us try to manage so that they do not consume more than they pay for.

No use asking if dairying pays or not ; whether one likes it or not, cattle must be kept, or the land will go to ruin very quickly. We cannot get out of that.

Therefore, a good system or rotation is necessary, and will be established in time, without doubt, to supply plenty of grass, clover, green-meat, silage, roots, pulse, &c.

In every trade, it is the large supply that makes cheapness.

On Ensilage.

I am glad to see a favourable reaction going on in the building of siloes.

Many farmers are to-day becoming acquainted with their value.

It is doubtless regrettable that several have not understood how to avail themselves of the advantages of the system. The want of knowledge of most of those who have spoken about it, and of those who have tried it, has greatly injured this improvement ; but it must be learnt : We have learnt it.

We affirm then that silage of maize is the only means by which more than one head of cattle can be kept to the 5 arpents with any profit.

Every county of the province proves this to those who do not keep their eyes shut.

All the objections possible are not worth one good feed of silage for the economical wintering of stock.

Let us then follow good examples.

Maintenance ration and Nutritive ration.

It is only needful to open the agricultural papers, the interesting reports of this Association, and a pile of other books, pamphlets, &c., to be found in the hands of the members of the farmers' clubs to-day, to see examples of these rations.

In the first place, the animal eats to maintain life; if he eats more, the surplus goes to the more abundant supply of meat, fat, milk, eggs, wool, &c.

The important, though often difficult point is, to have enough judgment not to give an animal more food than it can utilise profitably.

One cow can make good use of lots of silage; another will pay better if fed on dry oatmeal.

It all depends upon constitution, and this would lead me to speak of the importance of uniformity in a herd.

In all this then, a great deal of the spirit of observation is wanted: the result is called—experience.

Perish, then, the man of routine!

In this matter, the success obtained and the quality of the manure are the most natural guides.

The selection of Milch-cows.

How happens it that most of the men, who have been farming for 25 or 3 years, have not even now more than 2 or 3 good cows out of 10, and even fewer

In the Provincial Competitions of Agricultural Merit, we have the advantage of visiting many of the best farmers in the province.

Out of the 15 marks allotted to stock, it seldom happens that we give more than 9 or 10.

Is it then very difficult to provide ourself with good dairy-cows.

This is, and will be for many a day, the cause of most of the failures, or rather of discouragement, to a very large number.

Doubtless, the price of butter and cheese are rather lower; but I would be *men of good will* to make a *slight calculation* in their parish, and find out what is the average yield of milk from the cows.

If the creameries and cheeseries receive between them 40,000 lbs. of milk (*a day?*) from 4,000 cows, you have an average of 10 lbs. a cow; but if the same quantity is supplied by 2,000 cows, the average is 20 lbs. a cow.

Well! There are parishes, and therefore farmers, where the average yield of the cows is not more than 8 to 10 pounds a day.

It is then surprising that dairying ruins some men and pays others ?

Let us then keep good cows.

To hear some men talk, one would think that each has better cows than any one else !

Just make this little calculation ; that will open your eyes as much as any amount of big talk. It is so simple, that there must be something in it.

Oh yes ! but whence are we to get the good cows ?

All men of experience know ; I will not tell ; but I may add that it would perhaps be as well to inquire.

How keep good cows, when we have them ?

My goodness ! Don't sell them, and treat them properly.

The trouble is, that if a man wants some thirty dollars or so, in a hurry, the best cow is picked out, and sold to a town milkman, to the village tradesman, or even to one's neighbour.

Who can reckon up the number of first-rate cows sold to town milkmen, and sent to the butcher the following year.

Cannot we, somehow or other, amend this ?

A little less extravagance in dress, carriages, houses, etc., would often prevent this misfortune. Let us practice economy more.

Sell one's best cows ! As well sell the farm at once.

What would one think of a carpenter who should sell his best tools to pay for a piano ?

No one would confess himself guilty of such a crime : still it has been done by many a one !

Let us then be in earnest, and use wisely the gifts bestowed upon us by Providence.

Of the Spirit of Combination.

Is there to-day a class of professional people or of tradesmen that forms a greater and more perfect association than the farmer-class ?

Is there any organisation more powerful, more capable of studying its true interests, and of making better use of its resources ?

Can we not reckon upon more than 500 parochial or farmers' clubs, whose meetings are held with a view to the instruction and improvement of the lot of the farmer ?

Do the farmers, as a body, understand this thoroughly ?

Let us put new life into our zeal, gentlemen, and be worthy of the honourable position we hold in society.

Let us inform ourselves more concerning the things that affect us, and the more we learn, the more attached shall we become to the soil of our country.

Let us be men of courage, prudent and earnest, proud of the products of our good sense and our labours ; let us be proud of the good repute of our province ; let us make it still more grand by a novel gallantry, and to our children let us leave as a heritage the recollection of passages of glory and of inexpugnable honour !

Of Primary Instruction.

The Dairymen's Association being the greatest and most distinguished expression of the great agricultural family, I beg respectfully to express a desire: that, in conjunction with religion, agriculture may occupy the leading position in the rural primary school.

To explain :

I wish, if ever the uniformity of school-books is the rule, a matter, now, very much in discussion, that the reading-books be filled with agricultural matter.

That the arithmetics and book-keeping forms be crowded with problems in agriculture, in land-measuring, etc.

That the examples given in grammar, and the exercises in grammar and style, be chiefly on agricultural subjects.

And lastly, that the text books be, as far as possible, saturated with things pertaining to rural life.

This subject is inexhaustible and full of all manner of attractions.

I would not have a dry, entirely material science, but that everything should be treated from a point of view purely Christian.

The child would thus be accustomed to observe, always and everywhere, the admirable unity of the works of the Almighty.

Both his mind and heart would become filled with love for the manifold wonders and blessings he sees around him.

He could not avoid admiring the infinite and provident wisdom of Divine Providence.

He would all the more believe in the care that the Creator is taking of all things, and his life-long experience would keep him safe under the eye of his God.

Oh ! how grand and practical would be the teaching in our rural districts were it given from this point of view.

Without reckoning that, with text books worthily prepared, the teaching of our masters and mistresses would be all sketched out beforehand.

What grand chapters have been written, by how many great men, on the happiness and blessings of a country life!

Did not our Lord himself draw some of his finest illustrations from the book of nature?

Let us imitate, to the best of our ability, his method of teaching; then shall we succeed in retaining our rising generation in the pleasant paths of agriculture.

They will wander far less from that pure and Christian life, which forms the chiefest adornment of our good Canadian homes, and gave to the country those men whose advent forms an epoch in history.

Then, let us love agriculture, let us love it practically, let our children study, again and again, the successes of our model farmers and settlers.

Let them have constantly before their eyes the grand examples of laborious exertions, management, and justice; then will they continue the wholesome traditions which make nations happy and prosperous.

Gentlemen, I cannot, under the emotion of a sentiment of deep gratitude, leave this platform, without uniting with you all in recalling the memory of him who was one of the most devoted members of our Association.

You already feel that I bewail with you the very serious loss of that excellent Edward Barnard, whose memory rests, and will rest for ever graven on the heart of the true friends of the farmer.

Who can relate the enormous labours accomplished by this unwearying worker?

Exists there any improvement to which Mr. Barnard did not supply a large share of the devotion and sacrifices needed to secure it?

Was he not always on the breach, burning with a desire to be useful to everything and to everybody?

Turn over the leaves of the Journal d'Agriculture, the founding of which goes back as far as a quarter of a century, and you will find him always the same Edward Barnard, struggling with invincible energy against ignorance and prejudices of every kind.

Was he ever seen to relax his course against every species of imaginable obstacles?

Has not the fire that devoured him made burst forth in us those sparks that illumined the ardent love that animates us to-day?

Was he not the ever-precious support of all our agricultural meetings?

Who is he who, having known intimately his generous sentiments, has not felt himself moved by equally warm convictions?

His faults, even, were the subject of grand and useful lessons.

Honour then to that illustrious agronome! Honour to his memory and to his virtues!

Honour to him who poured forth all his resources, all the riches of his fine mind and of his noble heart for the grand cause of agriculture!

Honour to him who, in the very night of his death, was preparing for his paper the practical counsels of his long experience!

Let an enthusiastic outburst of gratitude raise to him at least a monument of prayers!

And may that heart, so overflowing with love for his countrymen, that heart so widely open to all sorts of noble causes, that heart so warmly devoted to his religion and his God, rest in peace!

EDMOND DALLAIRE.

DISCUSSION.

An unknown Delegate.—You said in your lecture, that, in the county of Deux Montagnes, there was a parish in which the cows averaged 20 lbs. of milk a day throughout the year.

M. Dallaire.—No, not throughout the year, but throughout the cheese-making season, *i. e.* 7 or 8 months, from May 1st to about Xmas.

The Delegate.—Will you tell us how the cows of that parish are fed; they must have something besides grass, or else they must be extraordinary cows?

M. Dallaire.—Nothing but water and good grass; but proper pastures must be prepared for them. I wish you would make another calculation. How many pounds of clover-seed are annually bought in your parish? There are parishes in the province where not a pound of clover-seed has ever been sold! When buying is the question, there is always liberality enough, except as regards clover-seed. Clover and green-fodder are both necessary.

M. l'Abbé Côté.—Are ten pounds of clover-seed to the arpent enough?

M. Dallaire.—Ten, twelve and even more are needed. I heard, yesterday, at the hotel, people complaining of the cheapness of clover-hay. What can be better than that? When we do not know how to get rid of our clover-hay, let us start dairying, make pork cheaply. If a dealer comes hither after a carload of hogs, could he get it? There are none! There are farmers now who are trying to buy lean pigs to fatten; that is not what they ought to be doing; they should have hogs to sell and make money by. Two lean pigs to each cow; that's the ratio. I call them lean pigs, because I won't say fat. It is the uni-

versal aim to make hogs too fat. That is not the thing ; about 150 lbs. is what is wanted. Come to Montreal, and you will see full carloads of small hogs from Ontario unloaded there.

To make a dairy of cows pay, they must average from 15 to 20 pounds a day each. A bad cow will eat more than a good one, and won't give any more milk.

The Delegate—This year, we had such grass as I never knew of before in my 30 years of farming ; my cows are as good as my neigbour's, but they won't average 20 lbs. a day.

M. Dallaire—Yes, but they are not better than your neigbour's ?

The Delegate—I always give them green-fodder, but they don't give 20 lbs. a day.

M. Dallaire—Improve your herd. With so much grass as that, a good cow would give you 25, 30, 35, 40 lbs. of milk a day.

The Delegate—We cannot buy such cows in our parish every day.

M. Dallaire—Go elsewhere.

The Delegate—Nobody has ever succeeded in obtaining the result you speak of ; for a whole herd, that is.

M. Dallaire—Just calculate : since your cows are as good as any in the parish, you get an average of ten or eleven pounds of milk a day from each cow.

The Delegate—I get more than that.

M. Dallaire—True, but you are the best.

The Delegate—You have already been to Ste-Martine, to lecture. You told us to keep a pig to the arpent. I took your advice. In spring, I took a piece of land and divided $\frac{3}{4}$ of an arpent into two lots, sowed clover on them, and put the pigs there. While the clover was growing, the pigs profited, but when it dried up, if I had left them there they would have died. You tell us things that get us into a scrape.

M. Dallaire—If you had a little green-fodder handy, pease and oats for instance, to give them till the clover had grown again.

The Delegate—When the fall came, what should I have done ?

M. Dallaire—Sent them to the bacon-dealer, whatever they weighed.

The Delegate—They were not good enough for slaughter.

M. Dallaire—Then they must have been of a bad breed. Why do you not succeed like others ?

The Delegate—Just so ; that is what I want you to tell me.

M. Dallaire—Manage so as to always have something to give to your pigs. Be prudent ; begin with a small number of hogs, and you will then keep more and more every year. Farming is like everything else : begin on a small scale.

REMARKS BY MR. J. H. SCOTT, OF THE FIRM OF MESSRS. A. A. AYER & CO.

I am glad to have been asked to address a few words to the butter-men of this province, and to have the opportunity of offering them my sincere congratulations on the satisfactory results of last season. The demand for our butter was never better, and the market easily took all we sent thither, and at prices that we have every reason to believe most gratifying.

The improvements in the service of the carriage of butter, result of the establishment of refrigerators on vessels and cars, enable us to get our butter to England in perfect condition, and all those who took our butter last season seem to have been well pleased with its condition and quality ; besides, there is no doubt that the English market can take all our make even if it were quadrupled. So, let us appeal to the farmer not to allow this opportunity of making money escape him. As to cheese, we seem to have reached the *margin of safety*, and all future increase would be the ruin of that trade, for it would be over-production. With butter, it is just the contrary ; the market is there ready for us, prepared to take all the butter of good quality we like to send thither.

If it is true that a large percentage of our butter was classified as "*Choice*." last season, there was still plenty of "*second quality*," the chief defects being mould, taste of fish, a strong or oily aroma, mottles or white spots. (1)

Makers ought to avoid these faults, especially bad aroma of every sort. The taste of fish is the worst aroma of all, and depreciates the price by 2 to 4 cents a pound.

Packing is a very important point; unfortunately, we find a sad tendency to buy cheap boxes instead of those of the best quality. Allow me to advise you to buy nothing that is not of the best quality, whether boxes, salt, or, especially, workmen. It will pay you to keep strictly to the best of everything.

Let everything belonging to the creamery be kept perfectly clean; your refrigerator must be well built, so as to be always cool, dry, and clean. Mould is caused by bad boxes and bad refrigerators : avoid both.

The exports of butter from May 1st to November 26th, 1898, from the port of Montreal, were 284,401 packages; in 1897, during the same period, they were only 221,766 packages: an increase of 62,635. But these figures do not

(1) *Aroma* is the Greek for *seasoning* or *spice*. A. R. J. F.

really show the true increase of *Canadian* butter exported, for in 1897 we had 53,774 packages of *American* butter, while in 1898 there were only 23,971; so that it may fairly be stated that the exports of *Canadian* butter during last season, exceeded by 92,438 packages those of 1897.

Out of a total of 2,115,954 cwts. of butter, equivalent to 4,231,508 boxes of 56 lbs. each, imported by the United Kingdom, from the Colonies and from abroad, from May 7th to December 3rd, Canada supplied 133,384 cwts., or 266,768 boxes, that is 6½% of the entire import.

Looking at the marked improvement in the quality and the reputation of Canada butter, especially of that of the province of Quebec, during the last season, and considering also the fact that our butter on the English market is received with more and more favour, I dare predict that the day is not far off when instead of supplying England with 6½% of her butter-imports, Canada alone, will send her 25%.

THE RIPENING OF CHEDDAR CHEESE.

By Emile Castel.

The question of the ripening of cheese is on the orders of the day, not only on our programme, but over every one of the States of the American Union in which cheese-making is of any importance. For several years already, it has been under investigation in the Madison dairy-school, where has been made a series of researches and experiments, destined to establish the laws governing the ripening of Cheddar cheese. The task is arduous, and the problems demanding solution are numerous; but the affair is in good hands. Professors S. M. Babcock and F. L. Russell are not unknown to us, and we are sure that their labours are worthy of confidence. These two *savants* publish from time to time, in the reports of the Wisconsin Station, the progress of their researches, and it is in these reports that I found the diagram you have before you, and which I have had enlarged to submit it to your kind consideration.

Before attacking the explanation of this table, I think it well to submit to you some observations taken from the 14th annual report of the Wisconsin Station:

"The ripening of cheese is a natural phenomenon, the details of which are as yet but imperfectly known. Throughout the whole manufacture of cheese, there is no one single process at once so important and yet more neglected than that of ripening. As soon as the cheese is on the shelves, the maker, too often, troubles himself no more about it. If we consider the conditions under which cheese ripens in this country, we find that, as a rule, the details of the process of maturation receive either no attention at all, or very little. The ripening-rooms are in general built as cheaply as possible, no effort being made to control the temperature or the degree of humidity. It is by no means rare to find cheese in

rooms whose temperature is subject to all the variations of the exterior temperature. Under such conditions, the losses are enormous, and in the opinion of the most authoritative experts, they amount in money to several millions of dollars."

Messrs. Babcock and Russell are speaking here of the losses incurred by American cheese; and we—what shall we say of the losses incurred by Canadian cheese? The descriptions of the ripening-rooms you have just listened to only apply too well to those that we dare to call ripening-rooms here, and which are nothing but drying-rooms.

To appreciate properly the necessity of thorough ripening, it is essential to understand, at least in a general way, the changes that take place during that process, as much as regards the physical as the chemical mutations. The solids of cheese, in a fresh state, consist of proteids (casein, etc.), fatty matter (butter), sugar and ash. During ripening, the sugar rapidly disappears, being converted into lactic acid and other sub-products; the fat and the constituents of the ash practically undergo no change, while the proteids, both physically and chemically, are the objects of recondite transformations. The addition of rennet to the milk converts the colloïdal casein into an insoluble substance; and unless submitted to exterior agents, it remains for an indefinite period in the same state. During ripening, it gradually loses its properties, and is converted into a plastic mass (capable of being moulded or kneaded), having both texture and appearance utterly different. This alteration is caused by the decomposition, more or less perfect, of the curd, into substances analogous to *peptones*, and finally into compounds still more simple, which are more easy of digestion, and still more soluble than they originally were. The effects of these changes is to convert the green-cheese into a substance easily assimilable, and of a peculiar aroma, which is the essential characteristic of well matured cheese.

These two factors, texture and aroma, are to be considered apart from one another, for, in the light of our present knowledge, they are due to causes of a different order. In support of this assertion, we cite the fact, commonly noted, that, in the ripening of cheese, the texture has already undergone considerable changes before any characteristic aroma is developed. Up to the present, in most of the treatises on cheese, these two points have been treated as one: whence much confusion. We shall only discuss here the alterations that affect the texture of cheese.

THEORIES ON THE RIPENING OF CHEESE.

The first researches into the solution of this problem were made solely from the chemical point of view, and all the elucidations propounded of the changes observed were based on purely chemical action. The discoveries of Pasteur on fermentation gave a fresh impetus to the investigation, and a novel direction was indicated. Since that time, the biological side of the question has taken precedence, and, practically speaking, it may be said that all the theories relating to the ripening of cheese are founded on the activity of living organisms: principally of bacteria. As to the presence of bacteria, in hard cheese, like Cheddar, the following facts are generally accepted:

When the casein becomes coagulated, a considerable proportion of the bacteria, present in the milk, find themselves in confinement. So that the cheese when it leaves the press contains precisely the same *flora* (plants) as the milk. In a few days (from 2 to 5), according to the condition in which the cheese is kept, the bacteria begin to develop themselves rapidly. Not that all the species develop at the same pace; the most active are those capable of the production of lactic acid. Those bacteria that have the property of peptonising or digesting the curd, are suppressed by the development of those producing lactic acid, and are generally eliminated. On the other hand, the lactic acid bacteria assume an enormous development, so that each *gramme* (about 15½ grains), often contains several millions of them. This phenomenal development continues for a variable time, and then the bacteria, all of a sudden, quickly become fewer. During the period of development, the cheese shows clear signs of maturation, the casein (curd) becoming soft and more soluble.

It is the English savant, Lloyd, who first showed the predominance of the lactic type of bacteria in Cheddar cheese. Freüdenreich had showed it in Gruyère; and Russell confirmed their discoveries by his studies on American Cheddar. Lloyd and Freüdenreich agree in attributing the leading part in the ripening of cheese to these bacteria. Since these investigations, the general tendency has been to study the phenomena of the ripening of cheese solely from the bacteriological point of view. Professors Babcock and Russell now hold that they should be studied from both points of view, chemical and biological; their researches lead them to conclude that there is an inorganic ferment present, and here are the conclusions arrived at in their last publication:

"Nowadays, the phenomena of the ripening of cheese are explained by the sole action, direct or indirect, of bacteria that, present in the milk, become incorporated in the cheese. These phenomena are both physical and chemical in order. Physically, the green cheese is hard, elastic, and insoluble, presenting in thin slices an especially opaque appearance. In ripening, it softens, becomes more soluble and semi-transparent. Chemically speaking, the changes are almost entirely limited to the nitrogenous constituents, which are rendered more soluble and, consequently, more digestible. Resulting from the decomposition of its proteids, the cheese contains albuminoids, *albumoses*, peptones, starchy products (tyrosin, leucin), and ammonia.

"The enormous development of the lactic acid bacteria in hard cheese, and the elimination, from the starting of the ripening, of the organisms of digestion and peptonisation, led Lloyd, in his labours on English Cheddar, and Freüdenreich, in his researches on Gruyère, to attribute the principal part in these changes to the ferments of sour milk.

"As far as they depend upon the bacteriological changes, we have been able to confirm these results; but, from the beginning of our work, we observed facts that do not agree with their theories.

"Two independent series of experiments showed us that very great changes, in both physical and chemical order, are produced in milk from which bacterial ferments have been excluded. In these experiments, the casein of the milk

underwent practically the same phenomena of decomposition that are produced in the ripening of cheese, that is, all the insoluble casein was converted into soluble nitrogenous matters, as was observed before.

" Parallel experiments with cheese gave like results, qualitative and quantitative, the products obtained being in no wise different from those of a cheese ripened normally.

" Having eliminated the effects of the organised ferments (bacteria) by means of chemical agents, such as ether, chloroform, benzol, &c., which do not affect the action of non-organised ferments, we arrived at the conclusion that the changes produced were not due to the living organisms, but, without the slightest doubt, to enzymes. (1)

" As to the origin of these enzymes, two hypotheses offer themselves : either they are produced by the bacteria which were developed in the milk before the application of the anæsthetics ; or they are inherent in the milk itself. The possibility of the work of the bacteria may be got rid of by taking milk, very carefully drawn from the cow, and treated at once with antiseptics. Milk, tested immediately after milking, undergoes the same changes as the rest, thus proving that enzymes exist in milk. By the use of the ordinary physiological methods, the enzymes that act on nitrogenous matters, and which, applied to milk, have coagulating as well as digestive powers, were isolated. The recent efforts to explain the peptonisation of the casein by a digestive function of the bacteria of the lactic acid type, have eliminated that factor, because the milk employed in these experiments had been sterilised by heat, a process which weakened, if not destrayed, the natural ferments of the milk. It is, then, our conviction, at present, that the ripening of hard cheese, instead of being due solely to bacterial action, is caused by the united action of organic ferments (bacteria) and inorganic ferments (enzymes). To the action of the enzymes on the cheese is undoubtedly due in great part the softening of the casein ; as regards the production of the characteristic aromas, our knowledge is, as yet, too vague to allow of our affirming anything positively, as to their origin. According to all probability, the bacteria, in this point, play a much more important part.

INFLUENCE OF TEMPERATURE ON THE RIPENING OF CHEESE.

The value of cheese, such as we find it on the market, is subject to many variations ; this is due to the difference of quality, and this again is due either to the use of faulty milk in the making of the cheese, to the want of skill in its manipulation, or to the defective installation of the department wherein the cheese is placed for ripening. Though all these factors are of vast importance, the first and the last are of the greatest importance, and it is to them that must be chiefly attributed the loss which now occurs, under the present commercial conditions.

(1) *Zumè* is Greek of yeast. A. R. J. F.

The conditions necessary to the good working up of the milk are generally pretty well understood, and the losses due to this source usually spring from want of care more than from ignorance. But with the process of ripening, it is not so. There, we have still many difficulties to overcome, given our ignorance of the changes produced, and until we have more information on this matter, the results obtained will most frequently depend upon purely empirical methods of working.

It is impossible for us to estimate, even approximately, the extent of the losses that the State of Wisconsin alone suffers, on account of the want of proper arrangments for the ripening of its cheese. Experts estimate these losses at hundreds of thousands of dollars a year. If these losses absorb so large a proportion of the profits that this trade ought to realise in Wisconsin, what must be the state of things in those parts of the country, that do not possess the same advantages of climate.

Still, the natural conditions existing in our State are far from being ideal. In the ordinary ripening-rooms, no effort is made to control the temperature, and, in consequence, its fluctuations in these rooms are almost the same as out of doors. The reports furnished us by the pupils of our dairy-school on the most striking features of the present conditions of their factories, contain the following information for the month of July, 1897. In the best factories, those that have cellars and sub-earth ducts for the ventilation of their ripening-rooms, the fluctuations of temperature were about 10° F., 65° being the maximum ; the temperature in one ripening-room, fairly ventilated, where no precautions had been taken to lower the temperature, varied from 20° to 30° F. In the majority of the rooms, no attempt at isolation has been made, and the temperature rises to almost the same degree as that of the exterior air. Not only is this maximum too high for ripening cheese (104° F. was observed in one factory, and in many more, upwards of 90°), but the sudden changes of temperature are still more dangerous.

The effect of such high temperatures is very injurious to the quality of cheese, which loses in value not only by the melting and exuding of the fat, but also by the damage caused to both texture and aroma by these abnormal heats. In the following diagram, the variations of temperature, taken in a badly built ripening-room, are shown in comparison with those taken in the cheese-cellar of our dairy-school. The line B.B. shows the fluctuations of temperature that too often take place in our ripening-rooms; the more the pernicious effect of these high temperatures is decided, the darker are the lines that represent it. It is worth remarking, that the ripening cheeses were never in a proper temperature, except for a small fraction of the three days occupied in the investigation. This diagram represents the real conditions observed in September, 1897. There is no doubt that, if these observations had been made in the summer, the cheese would never once have been found to be in a temperature really favourable to its ripening. As opposed to the line B.B., the line A.A. represents the condition of temperature which reigned during the same length of time in our own cheese-cellar. The effects of perfect isolation opposing itself to the fluctuations of temperature, are thus graphically demonstrated.

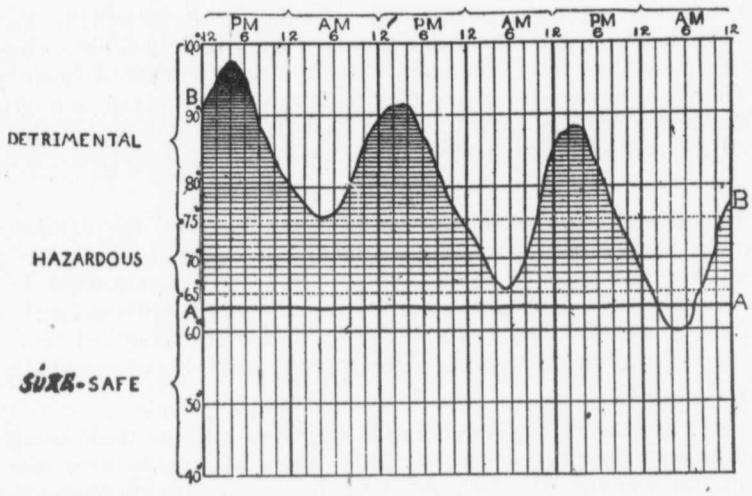

Diagram showing the daily fluctuations of temperature in the ripening-rooms in September, 1897. *A. A. cheese-cellar in the Wisconsin dairy-school. B. B. a badly isolated ripening-room too often to be met with. The depths of the shading represent the relative injurious effects of high temperatures.*

We can then divide the variations of temperature generally occurring into three zones, more or less well defined. 1. Variation of temperature, invariably injurious, starting from the maximum limit, which may be reached at 100° F., falling thence to as low as 75°, according to the kind of cheese made. 2. An intermediate zone, starting from the above minimum limit down to the point where no injurious effect is noted. This zone, that may be called "hazardous," varies from 75° to 65° F. 3. A lower zone, at which favourable results are always arrived, embraces the lower temperatures up to 65° F. Naturally, the cheese cannot ripen in the neighbourhood of the freezing point, but we have, in our experiments, succeeded admirably with cheese ripened in a temperature of about 40° F. The chief objection to ripening at so low a temperature is the time it takes to finish off cheese. People say that very low temperatures, especially at the beginning of the ripening, are injurious to the aroma, and impart a bitter taste to the cheese. It is for this reason not considered safe to put cheese at once into cold-storage.

To settle the conditions of good ripening, the Madison Station undertook a series of 5 experiments, in each of which from 3 to 5 cheeses of normal size were made, with mixed milk, under exactly the same conditions of making. It was not until the cheeses were taken out of the press, that they were put to ripen under different conditions. At regular intervals, the cheeses were examined as to quality, and analysed both chemically and biologically. We shall not enter into the details of these analyses, but limit ourselves to giving the results as to the commercial value put upon the cheese maintained at different temperatures. The difference of the temperatures to which these cheeses were exposed, made

them ripen more or less rapidly, so that it would be necessarily unfair to compare them directly with one another by judging them all on the same day. If they are judged very soon, the cheeses kept in cold compartments would be too green to please the market ; contrariwise, if the judging is postponed until they are in good order, those kept to ripen in a high temperature would be found to be already too far advanced ; but in our case, it invariably turned out that whenever the cheeses were kept for a long time, the result was that the cheeses ripened in a low temperature were of excellent quality, while those ripened in a high temperature were manifestly inferior, both as regards texture and aroma. The cheeses ripened in a low temperature were quite as good as those ripened in the normal temperature, although the time required to complete their ripening was of course longer. Thanks to the courtesy of Prof. N. J. Noyes, of the Ohio dairy-school, we were enabled to obtain a perfectly unbiassed estimate of the trade-value of the different cheeses. Prof. Noyes fixed the value of the cheeses ripened in the cold-storage at $7\frac{3}{4}$ cents, while those ripened in a high temperature were rancid, and not worth more than 3 to 4 cents a pound, the cheese ripened in the normal temperature being worth within a trifle as much as those ripened in a low temperature. At the time of the valuation, the best Cheddar was quoted at $7\frac{1}{2}$ to 8 cents. Prof. Noyes remarked, that the difference in value was due entirely to the effect of the mode of ripening, the flavour and texture being injured by the high temperature, while the cheeses ripened in the cold-storage were quite as good as those ripened in the ordinary or normal temperature.

PRACTICAL CONCLUSIONS.

1. *Influence of temperature on the period of ripening.*—High temperature materially accelerates the changes that ripening produces in the cheese. At a temperature of 85° to 90° F., the softening of the casein, measured by the soluble proteïds formed, travels 2 or 3 times as far in the first few days of the ripening as in cheese kept at a low temperature (50° to 55° F.), but, finally, cheese kept at a low temperature ripens more completely than cheese kept in a higher temperature.

2. *Influence of the temperature on the quality of the product.*—Cheese ripened in a high temperature (about 70°) is inferior to cheese kept in a lower temperature ; even at or about 50°, no ill effects are found. Cheeses ripened in a high temperature were found to have suffered, not only in texture, but also in aroma ; they have a piquant or sharp flavor, very perceptible, which is often met with in cheese coming from a bad ripening-room, where the temperature is, most of the time, within the hazardous or detrimental zone.

Cheese ripened at 55° F., and below, is invariably of good quality, although mild in flavor ; it is entirely free from any bitterness (this contradicts the usual opinion), and compares very favourable with cheese kept at 60° to 65° F.

The relative humidity of the air in ripening-rooms kept at a low temperature is generally greater than in ordinary ripening-rooms ; whence it follows

that cheese put into a cold ripening-room never has a rind so solid as is desirable. Such cheese also moulds much more. Still, a good rind can be had by keeping the cheese for a few of the earlier days in a warmer, drier room.

3. *Relation of temperature to the loss of weight.*—The average loss of weight in Cheddars is about 5%. It is due chiefly to the partial drying of the cheese. At a high temperature, this drying goes on rapidly, and is accompanied by a considerable loss of fat, which escapes from the cheese on account of its liquid state. In a low temperature, there is no escape of fat, and the drying is greatly diminished.

4. *Relation of the temperature to the period during which cheese lasts fit for market* (Quality of keeping).—Cheese ripened in a high temperature attains maturity rapidly, but only lasts in its best condition for a time relatively short. Its "commercial period," therefore, is short. Cheese, ripened in a low temperature, attains maturity more slowly, but as its quality is generally much better, and as its "commercial period" lasts much longer, the lengthened time occupied in its ripening is fully repaid by the extra value of the product.

5. *Low temperatures are safer for the ripening process.*—Here, in Wisconsin, the ripening-rooms of the ordinary style almost invariably attain in summer a temperature incompatible with good ripening, so the erection of ripening-rooms of low temperature has always invariably paid, for by this means the cheese was kept at a safe temperature, and not left at the mercy of the daily variations of the weather. This low temperature can be very economically maintained by improving the isolation of the ripening-rooms and the cooling of the air, by means of cellars and sub-earth ducts, and by using ice and mechanical apparatus.

6. *Central Co-operative ripening-rooms.*—It being granted that the cost of a proper ripening-room and well built stores is considerable, many private factories cannot, without inconvenience, incur the outlay necessary for their erection, in spite of the profits that would be the result of the increased value of their products. This difficulty might be easily overcome in those districts where cheesemaking is a leading trade, by the erection of central ripening-rooms, with cold storage compartments, to which the cheese of a certain number of factories might be sent, at frequent intervals, there to ripen under uniform conditions of safety. The improvement of quality, and the extra value thus secured for products ripened in this way, would doubtless secure large returns for, capital employed. Wherever the majority of factories are private property, this system recommends itself. It is another legitimate consequence of the spirit of co-operation that is the main feature of dairying in this country. This centralisation and co-operation in the most important part of cheesemaking, has the following advantages :

(*a*). It would decrease the inevitable losses produced in the quality and quantity of the cheese, and consequently ensure to the patrons of the cheeseries larger profits than those reaped to-day.

(*b*). The same results could be secured at a less cost than in private factories.

(*c*). It would admit of the employment of experts to watch the ripening of the goods and to look after them in a way much more satisfactory than can be done, in the factories, by the cheesemaker, whose time is always sufficiently occupied with other cares.

(*d*). It would facilitate the sale of the goods, by giving buyers a chance to inspect personally, at less expense, large lots of uniformly ripened cheese, and this would insure a higher price for the cheese, even for the same quality. This, too, would put a stop to all cuts after delivery, and the cost of freight would equally be lowered by the sending out of large consignments. In private factories, if the cheese is kept to send off by rail, the ripening of the goods undergoes great changes, by which their value is greatly diminished.

(*f*). Granting that these dépôts should have cold-storages, the cheese might be kept there in safety for sale at any opportunity that might offer. Generally speaking, the cheese in factories has to be sold when the hot weather arrives, whether prices are good or not. This often places factory-proprietors at the mercy of buyers.

ADDRESS BY MR. J. A. McMURRAY,

Of the Ottawa Experiment-Farm.

Pray do not imagine, Gentlemen, that, because my name is Scotch, I cannot address you in good Canadian.

When I got leave from my superiors to come hither, I expected to come to listen to the lectures and discussions; I came as an enquirer, to gain information. To my great surprise, I was asked to address you. Taken thus unexpectedly, I cannot treat any predeterminate subject, but, as you were just told, I am on the staff of the greatest agricultural establishment of the country, The Central Experiment-Farm at Ottawa, and I am about to say a few words on each of the following points:

1. The Experiment-Farm;
2. The part it plays in the different branches of farming;
3. Its importance to farmers as a model-farm.

I should have also something to say to you about the breeding of pigs and the selection of good milch-cows, but I shall not have time this afternoon; so, if you will allow me, I will treat those subjects this evening.

The Ottawa Experiment and Central Farm, as well as its branches at Nappan (N. S),. Brandon (Man.), Indian Head (N. W. T.), and Agassiz (B. C.), belong to the Dominion; they are the property of the Canada-farmer. The Ottawa Experiment-Farm was established by the Federal government for the purpose of making experiments in every branch of farming, and to answer the requirements of the provinces of Quebec and Ontario, as the branches do to the other provinces. By means of the branches the experiments made at Ottawa are repeated, to find out those that succeed in one climate but fail in others.

The Ottawa Experiment-Farm contains 465 acres of land (550 *arpents*); of which 65 acres are devoted to the planting of forest and ornamental trees; 30 acres to experiments of re-foresting; 35 acres to experiments in the practical cultivation of fruit. In this orchard we have 700 sorts of fruit-trees. In the kitchen-garden, we grow a thousand sorts of vegetables. Besides this, there are grown on the farm 125 sorts of wheat, 74 of pease, 72 of oats, 125 of potatoes, 67 of roots, swedes, potatoes, etc. Thirty-six kinds of corn are grown for cow-fodder; so, as you see, experiments in all the branches of farming are carried on. The branches in the other provinces do the same kind of work in accordance with the needs of their respective province.

Besides this, there is the *stock* of the farm: 100 to 110 head of cattle, and 60 to 75 pigs, besides poultry, of which we have 17 breeds, and 300 subjects; as to bees we have 60 hives.

The work of all this is done experimentally, practically, just as it ought to be done by farmers.

At the head of each department, there are professors: a specialist to attend to the poultry; another for the bees; a botanist, an entomologist; a chemist to analyse everything pertaining to agriculture, and a horticulturist to make experiments and to reply, as all the others of the staff have to do, to every question asked by the farmers.

This great farm publishes yearly a complete report of all the experiments made, not only at Ottawa, but at all the branches; all the experiments there are reported and explained. This report is sent, free, to all farmers who ask for it. You have not even to prepay your letters; all correspondence with the officers of the experiment-farm is free of charge.

Now, every variety of pease, oats, barley, wheat are also placed, free, at the service of any farmer who wants to try them. You have only to write to us and say that you want a good kind of pea, potato, wheat, etc., and a bag of 3 lbs. weight will be sent to you free of charge. This is another service the farm does you.

In the annual report of the farm, printed in both French and English, you will find a full report of everything we are doing. In 1877, I think, all the grain in Manitoba was ruined by a general frost. There was no Canadian Pacific then; the Government was obliged to buy wheat in the United States, and to send it through Dakota to be able to distribute it for seeding. Then, we

tried to find a more suitable variety of wheat. A Russian kind was imported and tried. It was found to ripen well, but the straw rusted a good deal. Then this was crossed with another kind of wheat, just as in crossing stock, with this difference, that this operation on wheat is one of the most difficult and delicate that can be done. By this means, a new wheat was obtained that does well in the Northwest. All these investigations and experiments were carried on at the Experiment-Farm.

The prosperity of our farmers and the success they have met with are due in great measure to the labor and experiments of the Experiment-Farm. The work done there is slow and costly; it requires much study from each of its officers; but when once an experiment succeeds, it is spread all over the country, through the reports and bulletins, and every one is enabled to benefit by it.

Look, gentlemen, at the work being done at the Experiment-Farm. Ask for and read its reports; you will find in them many things useful to you. They are all sent out gratuitously; not even your letter asking for them needs pre-payment.

I shall have something more to say this evening; so I beg to say: *au revoir.* (Applause).

The session was then adjourned.

CLOSING SESSION OF WEDNESDAY EVENING, DECEMBER 7TH.

This session opened under the Chairmanship of M. l'Abbé Côté.

Mr. McMurray—If this evening we have not so large a number of attendants, we have at least the choicest specimens. Those present have certainly come for the purpose of learning and of gaining information about the things belonging to their business. As I told you this afternoon, I came hither to learn, simply to gain instruction, but as you wish to hear me on the experiment farms, I will go on with my story of this afternoon.

As I told you, we have from 100 to 110 head of horned-stock at the farm; among them, there are the large breeds you were shown yesterday, the Holsteins, Shorthorns, Ayrshires, Canadians, Guernseys, etc. Now, when I speak to you about the *Canadian Cow*, you must not think I mean the registered Canadian; I mean the Canadian cow, such as one sees in most of your cowhouses in the Province of Quebec.

We have a piggery too, with from 50 to 80 pigs in it; there are pigs of the improved breeds, and common pigs, such as you keep.

Why do we keep all these breeds, do you ask? To make experiments on the way in which they fat, breed, and do for crossing.

What breed do we need to answer the demands of the market to-day? If you want to make bacon in connection with dairying, and choose Chinese or Berkshires, you will not succeed; you will make pork for the shanties. The trade does not want that sort of pork to-day. These pigs will make fat, but not the style of bacon in fashion at present, for the wants of to-day's market are very different from what they were ten or fifteen years ago; in those days, we wanted fat pork for the shanties, which was consumed in this country; now, we want a kind less fat and intermixed with alternate layers of lean; and for the production of such, do we need a special kind of pig? Yes, and the best kind is the one you have, your Canadian pig. An excellent cross, too, is one between a Canadian sow and a Tamworth or Yorkshire boar. These are the two great breeds that have the greatest power of transmitting their form. As soon as you put your small sows to one of these boars, you will have pigs just like the male parent; long and lank. If you already have sows of the great improved breeds you can, without diminishing the quality of the meat, put them to your own young boars or to a Berkshire. The Berkshires are smaller, and quicker in growth; they come to their full size in 7 months. More meat can be made out of these large breeds, but their pork is not suited to the demand of the dealers. When you buy males, take care what you are about; tradesmen are of course always honest men, but for all that do not trust them. I advise you not to buy by letter; try always to see the animal before buying it. You can get these animals at the experiment farm; for though, on account of the losses through *tuberculosis*, we have had no cattle to sell for some time, we have many specimens of the different kinds of pigs for sale.

I have advised you to buy your breeding-stock at the experiment-farm because, although you may have to pay more for it than from private breeders, you are more certain of getting that for which you are paying. I do not say this as an advertisement, just the contrary. If I advise you to make your purchases at the farm, it is because every animal that leaves us is a selected subject. No animal leaves the farm till it is two months old, and those that are not considered fit for breeding are kept for the butcher. We raise animals for breeding; we sell them at 8 weeks old, for eight dollars; if you want one of four weeks old, you will not be allowed to get it, so as not to send out to farmers anything but the best subjects. (1)

Now, we must reckon with natural defects; the boar you buy may turn out impotent; when you have tried him, if he does not answer, the Farm will take him back or change him for another. The object of the Farm is not to make money; you will not be told, as a dealer would tell you: it's not my fault. Such is the object of the Farm, that exists only for the assistance it can be to the farmer. So you will always do best in buying your stock at the Farm.

And now, recollect this: the pig, of all animals, must be kept clean; this may seem droll to you, but, all the same, it is the very truth.

(1) The word "subject" (*sujet*), used instead of *specimen*, is one of the myriad of French words retained by the Scotch. A. R. J. F.

Dr. Grignon—You tell us that the experiment-farms were created for the purposes of helping the farmer; will you be the intermediary between this meeting and the Farm to get us pigs rather cheaper? There are breeders, at Oka and elsewhere, who only ask 5 or 6 dollars a piece for theirs. It seems to me that if the experiment-farms wish to help the farmer, they would sell their pigs for that price, and I think the Dairymen's Association will approve of my idea. I see well enough that this would be entering into competition with the breeders of boars and sows, but it would be doing a service to the greatest number.

Mr. McMurray—Yes, that is true: I am quite ready to do what you ask, but it would be better for the Association to pass a resolution to that effect. The Farm does not to these things to make money; the farms are not ours or the government's, they are yours; they belong to the provinces of Canada; the people paid for them; they are your property; so, we must keep ourselves above criticism and all ideas of competition. Now, you pay us a visit, you will say: there's a fine calf; you offer us twenty dollars for it, and you won't get it; an hour, perhaps, afterwards, comes a butcher, and he gets it for a dollar and a-half! Why? Because the calf was not in every respect what a good breeding animal ought to be. You see we do not speculate; we are not allowed to deal in that way.

Were we to put our animals on the same footing as other breeders, we should be competing with them, and as farmers always have more confidence in the stock of the Farm than in the stock of private men, that would cause trouble. Look at eggs, for instance: you pay a dollar for a dozen eggs for hatching, and yet you can get the same eggs for 15 cents a dozen for eating. Why? because for hatching, only the eggs of the best breeds are chosen; and if the eggs prove infertile, the seller will, next year, either give you others or let you have them for half price.

To return to our pigs, I may tell you that whenever Farmer's Clubs have bought any from the farm, they have always turned our well.

In order to succeed with pigs, they must be kept warm, but not too warm though, and receive plenty of good but not too rich food. The hog is a greedy beast; he eats, as the saying is, "like a hog;" he eats so much that, if you give him enough, he will kill himself. He wants food enough to fill his belly, but the food must not be too rich. Don't let your pigs run about round your buildings in winter; you know well how the pig befouls things (*c'est détestable un cochon*); besides, they feel the cold and suffer from it. They must be kept indoors.

You will find it a good plan to have your sows farrow at the beginning of March or in April, so that the little ones can be weaned at the beginning or in the middle of May. Then they can eat grass, and the cows having calved, you can give them skim milk and bran. Never give your young pigs raw potatoes, they are almost poisonous for them. Cook both potatoes and roots for them, and keep the water in which they have been boiled to make a mash with some oatmeal. Never give them swedes, as they are too hard, and not rich food at all.

And now give them all the grass they will eat. The little ones should have every chance to learn to root; they should not be ringed at first. Put them up to fat at 5 months old, and at 7 or 8 they will be fit to kill, when they ought to weigh hard upon 200 lbs. If you fatten them in the open air, that is all right; they will do well, too, on boards. If you tell me there is such a thing as the foot-disease, I shall contradict you. It is you yourselves that give them that complaint. When they are kept on boards, they must have rich food, composed of a mixture of grain of different kinds. Give them all that cannot be sold; ground or not, but preferably ground.

Now, I am going to give you a sketch of the experiments being made at present at the Farm on the fattening of pigs. We have eleven sties, in each of which are 4 pigs; the sties are six to eight feet square. They are on boards, as they are here, but the boards are a little on the slope. The trough for food is in 4 compartments, so as to admit the head of only one pig at once. Being thus separated, they are all fed alike, and cannot dirty the food with their feet. The experiments that we are now making are for the purpose of finding the way to make the bacon best suited to the English market; not so much to find how to make the greatest quantity of pork at the cheapest rate, as to see what sort of pork can be made from such a given sort of food. The pigs get clean water twice a day.

In the sty No. 1, the pigs get unground maize.

In No. 2, ground maize, soaked for 30 hours, is given to the pigs; just the reverse of the former, you see.

Those in No. 3 get ground maize, soaked for 30 hours, and skim-milk, instead of water.

The pigs in No. 4 have the following ration: half, ground corn, and half, an equal weight of pease, barley, and oats, all mixed and soaked for 30 hours; then, an addition of milk. Water is given freely in a separate trough. The grain and pulse added to the maize are not ground.

The pigs in No. 5 get the same as the preceding, only the grain and pulse are all ground.

Those in sty No. 6, the same food as those in 4 and 5, with 24 lbs. of milk in addition.

The pigs in No. 7 are fed on a ration of pease, barley, and oats, unground, and mixed in equal quantities of each. This is given dry, with water separately.

Those in No. 8 have the same as the last, but the grain is ground, soaked for 30 hours, and given with lots of water.

You will perhaps ask me what difference it can make whether the grain is given mixed with water, or the water is given alone. If you will come to the Farm, I will show you the difference. The pigs that are given the grain dry, eat quietly; this takes a good deal of time, while eating, they masticate much more slowly; they have to leave off now and then to go to the trough to drink,

so digestion goes on better. Their hair is fine, they are lively, good-humoured, they lark about. But those that get their food soaking, eat much more a day; they eat a pound a day more than the rest, and increase quite a pound less in weight. They are not so jolly after eating: they feel themselves overloaded.

The No. 9 pigs are fed like those in Nos. 7 and 8, plus 24 lbs. of skim-milk and lots of water.

Those in No. 10 are fed on the following ration: half bran, and half a mixture of pease, barley, and oats, all ground up, soaked for 30 hours, and given in plenty of water.

Lastly, the pigs in sty 11 are fed in the same way as those in No. 10, with the addition of one-fifth of chaffed clover soaked in plenty of water. The clover thus added to the ration gives a good return and is a saving. Clover is good for young pigs; it is also good for the health of stock in general.

You perceive then that the experiments we are making at the Farm on the feeding of pigs are numerous. You cannot remember all that I have been telling you, but you can ask for our report, and therein you will find a full account of all the experiments now in operation.

Keep your pigs shut-up; give them good food, and keep them always clean. Don't give them, on any account, too stale milk that is putrid in the barrel; that is as good as poison to them.

Dr. Grignon—Do you recommend giving salt to pigs?

Mr. McMurray—Pig's food should never be salted. Swine need salt, but only in this way: if they are out in the field, they do not want it; they only take salt as a purge, and in the fields they can do without it. But if they are in the sty, give them coal and ashes, put in a corner for them, with a handful of salt thrown in from time to time. When the pigs feel that they need salt, they will go and get it. They digest their food better if they have salt, but they must be allowed to get it when they feel a desire for it.

Now, how are pigs to be fed?

If you have roots for them, cook them; make a sort of soup of them. Don't give your pigs their food in a trough in which remains some of the preceding meal. Don't feed them too lavishly; it is better that they should cry out for food than leave any. When you begin to fatten them, they will gain faster than towards the end; but take care not to make them sick; don't give them more than their stomach can assimilate. The moment you give your hogs too much to eat, they will have the foot-disease; and it is you that will have given it to them. The appetite leaves them, and it will be a week before it returns; you will have lost a week of the fattening, and your pigs will have been eating just the same. Feed three or four times a day, but in small quantities.

Now as to cleanliness. Even in winter, let your swine have clean water to drink. The stomach being full of food they utilise water to aid digestion, and are continually in want of water.

And by no means allow them to be cold ; with all this attention your pigs will never be ill.

When you want to have a good sow, look well to the number of her teats. Never take one with only eight, but choose one with from ten to fourteen. If a sow has fourteen teats, she will give you ten, twelve, and even fourteen little ones. Select a sow that looks like a milker ; lengthy, and with a belly that does not show as if hollow. (1.) If the belly of the sow looks "tucked-up," she will never make a good nurse, and the young ones will take after their dam.

Allow me also to say a word about cows ; others have told you how to feed them, and how to produce cheap milk. I also advise you to take good care of your cows, to feed them well, and I almost dare to beseech you to pay as much attention to your milch-cow as to your wife ; that is a good deal, as you see. Not only does the cow yield products of the highest class, from which we draw more than twenty millions of dollars yearly, by our exports of butter and cheese, but how many pleasant things does she bring into the household ! There you see a poor sufferer, whom the physician despairs of saving ; he has exhausted all the resources of his art, and when he can place no more confidence in anything, he says : let us try to get him to drink milk. See the mother who is at the point of death, leaving a poor little new born child ; who will care for this weakling, with what shall it be fed ? With the pleasant milk of the gentle cow, is the reply. The cow is a true benefactress ; she is almost a mother to us in our babyhood : let us take the greatest care of so good a being.

Your cowhouses must be well lighted, well ventilated. Tie up your cows in such a way that they can scratch themselves in the stall, and rub their necks. Let them always have clean water before them, and let it be of the same temperature as the cowhouse.

Feed them well and with a variety of foods. Do you think that a cow is likely to give you a fine calf if, during pregnancy, she has only dry straw to eat, and if she has to get her drink through a hole cut in the ice ? You will not have herds of fine calves and cows if you treat them thus.

If you want to know what is the best kind of cow for you to keep, I will tell you frankly : it is the cow you already have on your farms, the good little Canadian cow. One great fault in our farmers is that they only keep a yearling bull to get their stock. I advise you to keep a good strong bull, one able to transmit his good points. Make your cows calve late, that is not before they are 30 months old, for, before that age, unless they are especially well fed, they injure themselves by being in calf : they are too weak to stand it. The mother gives the milking qualities, the sire the form and colour. If we put our big

(1.) This phrase, I take to mean, "whose belly does not look tucked-up," as we say of a horse. A. R. J. F.

cows to a Canadian bull, he will very probably get a calf that will turn out a good milker, but just as probably, it will be nothing of the sort. The Canadian cows always give good milkers. Let us remember that, for richness of milk, our Canadian has never been beaten. You are never to put your cows to any but a good bull; he should be well fed, so that he may be strong and active in service? without activity, you will not succeed.

I thank you, Gentlemen, for the attention you have paid to my observations, and I invite you all to visit the Ottawa Experiment-farm: you will be received there with opens arms. (Applause.)

DISCUSSION.

Q.—In the crossings of the different breeds you have at Ottawa, have you tried the cross between Canadian and Jersey?

R.—Yes.

Q.—How did it turn out?

R.—The Jersey and our Canadian are almost alike, except that the Jersey is rather more black. We have crosses of the two breeds at the Farm, and they cannot be distinguished one from the other. The milk is as rich, and I think the crossing has increased the yield. Nothing but good can come from this cross.

LECTURE BY DR. GRIGNON.

I feel rather uncomfortable in addressing you, for the lecturers that have already spoken have said almost everything I was going to say. After having been a couple of days at our sessions, and after listening to all the speeches on the butter and cheese trade, you must surely think that we are in the "buttering" season. You know how, in election time, you voters are "buttered" by the candidates, by the canvassers, in fact by everyone; and now here you are being just as much "buttered" by the members of the Dairymen's Association. I hope, gentlemen, that you at least prefer our "butter" to the "butter" of the politician.

You are perhaps asking yourselves: Is not it queer what they want to do with us? They bring forward lawyers, priests, notaries, and now here they are putting up a doctor to talk farming to us! You would be wrong, however, to be surprised at that, since nowadays everybody takes an interest in farming. I saw in a paper that the Holy Father the Pope had directed wheat to be sown on his land, to see if there were lime enough in it; whereupon, I said to myself, if the Pope is a farmer, I do not see why Dr. Grignon should not be one, too. And if the clergy interest themselves in it, no blame can attach to them: for the same reason. All over the world, agriculture attracts the affections of all kinds of

dispositions, and still more does it affect them in our country, I think. I have seen in the House, while ordinary matters were under discussion, members fast asleep at their desks, but as soon as the word agriculture was heard, everyone was wide awake. Have you not read in the papers how Lady Aberdeen had built a dairy at Rideau Hall, that her children might be taught to make butter in it? Do you not know, too, that Our Gracious Sovereign, Queen Victoria, has a herd of cows, and has butter made by the princesses of the royal family? Looking upon such examples, is it not a shame for our little Canadian women to despise the farmer? For my part, I should always prefer a good milker to a *piano-smasher!* (Applause), and if I had advice to give you, it would be to convert all your fine carriages, your trinkets, and your pianos into good milch-cows: depend upon it the country would be all the richer for the change. When you see your Bishops, your priests, preaching agriculture, attending your meetings, you ought to be proud of the sympathy they manifest for you. Proud, too, ought you to be of the encouragement you receive from members of the House, and from Ministers. You have listened to their speeches, so full of good advice, and I trust you will put it in practice.

You have observed that the lectures and discussions at this meeting bore chiefly on dairying and pig-breeding. Well, there is still room for butter and for cheese. You are told everywhere in the province: make butter, make cheese; you will perchance inquire: Who is going to eat it all? Don't be afraid; there is plenty of room. England consumes yearly more than $60,000,000 worth of butter, out of which we only supply two millions' worth. Why, then, you will ask me, do we not get higher prices for our butter? Just consider; you are not the only people that send butter to England; there are other countries as well that are trying to get a hold on that market. So, we must do our best to make the best possible goods to prevent them. Don't fancy for a moment that the English will buy your butter out of sympathy, because Canada is an English colony. If our butter is better than the butter of other peoples, the English will buy it; what they want is something good; and when a good thing is offered for sale, the English do not stick at the price.

What distressed me more than anything else that I saw in my tours through this province, was the little care farmers take of their milk. At Beauce, last year, a farmer said to me: "What do you think of a man who takes a can of milk to the cheesery at the bottom of which, when it was emptied, was found a rat?" I replied: "You spoke about it to the man?" "Oh! yes," said he, "I told him it was not a wise thing to allow, and he replied: 'There is no use making such a fuss about it; this cheese is for the English.'" A peculiar way of looking at it, is it not?

I met a maker who was receiving 15,000 lbs. of milk a day in October. When he had shown me his books, and I saw the great quantity of milk he was receiving, I said to him: You must be rich and happy. "Not so much so as you fancy, Doctor; there are people who do not take much care of their milk, I can assure you. I have had milk here that had even dung in it." To which I replied: "Do you know that the man who sends in such milk is wasting three things; his milk, the milk of the other patrons, and a third thing: his dung?"

"What then," he asked, "should be done to such a man?" "What is done to cats that are dirty in a house: rub his nose in it." "But," said the maker, "that is not so easy; he is a powerful man; a 'bully' in the parish." "But there is the law," said I. "That is not an easy remedy, either," replied he. "This man is the father of 26 children, all married, and all living in the parish. If I refuse his milk, he will go to his children, his sons-in-law, their friends, and will tell them to keep their milk at home, and I shall not have a drop of milk." He was right, was this maker, up to a certain point; but, anyhow, he ought to have sent back the man with his milk, to see how his wife would have received him. Women are not always inclined to make butter, with a creamery at the door. And it is not every woman who knows how to make butter. In this case, the man, "catching it" from his wife, would have to give way; he would strain his milk, and every one would be satisfied.

Now, why do not people used aerating-strainers? Milk must be aired to rid it of the *cowy* taste that is communicated to both cheese and butter when the milk is not aerated, and it is to cure this that the use of aerating-strainers is recommended. Here is the reason why these implements are not in general use: of two neighbouring farmers, one bought an aerating-cooler and used it for some time; after which his wife said to him, one fine day: "I say; our neighbour does not use that strainer there, and he get as much for his milk as thou dost; if we do not use ours any more, it will make one fewer vessel to wash." The strainer was stuck up on a post, where it rusted quite at its ease. The neighbour sees it, and says to himself: "What is the good of having an aerating-strainer? My neighbour has tried one, and does not use it any more; it can't be good for much. And it ends by nobody using a strainer at all.

At St-Prime, Lake St-John, there was not, formerly, a single-aerator-strainer; the cheese made there was bad, and was refused at Quebec, whither it was sent for sale. A rule was then passed, to compel the farmers tc use the aerator-strainer, and now good cheese is made there that will sell anywhere. The dealers no longer ask for samples; they simply write: "Send us your cheese, and we will pay you the highest market price for it."

Just now, you were told all about the selecting of cows, but you were not told how to select them. What sort of cows do we want? It has been found that the best cows for us are the Canadian, the Jersey, and the Ayrshire. This does not mean that you have not in your herds all that is needed to make good cows. If you would take the trouble to rear no heifers but those from your best cows, before the expiry of ten years, you would have the best herds in the world.

If you would pick out a good cow, take care that she is short-legged, with a refined, delicate head, the horns curved inwards, the eye prominent and so intelligent that one would say it was about to wink at one. The brisket should be narrow, the hide supple, the ribs wide apart, and the *rosette* (?) on the back rather in the rear than in front; the further back it is, the better. These are some of the best points of a good milch-cow.

In selecting a cow, remember, next, that food seldom produces two things from a cow: meat and milk. If you have several cows, you will find that, with

one, food causes the formation of fat; with another, the production of milk; these differing aptitudes are also found in their ancestry. A good milker is never very fat, neither is the heifer born from her; she arrives in the world weak, hardly able to get up alone; you feel inclined to kill her. But take the trouble to lift her up for a day or two, and you will soon find her as active and vigorous as her dam.

Now, there is a mistake often made by our farmers, and encouraged even by some lecturers: they do not let their heifers calve early enough. In my opinion, heifers should calve at two years old, rather than wait till three. Why loss a year? Of course, this will not allow of the heifers being brought up along the high-road; for the high-road and lanes are not the places in which to rear heifers. When I first began farming, I did like the rest; the first heifer that came, *hop!* on the road with her; another came, and the same treatment followed. The fall came, and the heifers were so poor and I was so ashamed of them that I denied having anything to do with them. A man came to see us one day, who, seeing the heifers, asked to whom they belonged. I said I did not know; but my boy, who was there, exclaimed: "Dost thou not recognise them, papa, they are thine." I thought I should have died with shame, and I said to him: "Thou shalt never again make thy father blush about his calves."

Near us lived one Eusèbe Lajeunesse, who always had fine calves. I asked him how he managed, that I might have fine ones too. "Easily enough," replied he; "come and see mine;" and he took me to the shed. "What, do you keep your calves indoor?" "Of course I do;" then, I observed what a trouble it must be to keep calves thus in a shed. He said it was no trouble; in the morning, he gave them clover and skim-milk for the first few months, and then clean water to drink. "I began with dry grain, skim-milk, and green-fodder, and in four months I refused ten dollars apiece from the butcher for my calves." "Why do you keep them in," said I? "Because," he answered, "the sun, the rain, and the cold nights keep my calves back." This man had a herd of 25 cows, out of which eleven or twelve had calved at two years old, and I could not distinguish these from the rest of the herd.

As I left, I said to myself: "Next year, Doctor Grignon, thou shalt have as fine calves thyself." The first heifer calf was promptly put safely into a shed, so was the second, and the third followed suit: it was a perfectly successful plan. Just try it, and you will see. Keep one calf in, and another out, and compare the two in the fall; you will find a difference between them.

Another mistake is, farmers do not keep on milking a heifer with her first calf long enough. At Michaelmas, a heifer with her first calf slackens in her yield; the wife says: "The cow begins to weary, and I do, too; she is giving less than a couple of quarts; we will dry her off." With the second or third calf, this cow, towards the time when she was dried off the first season, will dry herself off, just as if she seemed to say to herself: "There; that's my task done; I shall stop now." If you milk her 9 or 10 months after her first calving, you are making an udder of 10 months. Do so; for a ten months' udder is worth more than one of six months.

Now, you can escape having your cows lose one or more teats, by using *massage* to the udder 3 or 4 weeks before they calve. Do this every fourth or fifth day. The object of this massage is to dilate the vessels that conduct the milk. Some time before calving, the milk begins to circulate through the vessels, and these require opening, enlarging. Otherwise, lumps of milk will form, producing inflammation, and, in consequence, causing the loss of one or more of the cow's teats.

An Unknown Delegate—If I understand you rightly, you say that we ought to milk our cows about every fourth or fifth day for three or four weeks before calving.

Dr. Grignon—Not to milk them, but to massage (knead) them. Draw the teats down as if you were milking, but without trying to bring milk. This will have the effect of opening the ducts, through which the milk is to descend afterwards. Do this a few times a week during 4 weeks before calving.

It sometimes happens that a cow has a difficulty in getting rid of the after-birth (1), that is, she does not cleanse easily; this is a loss of from 15 to 20 dollars, because she will dry-off, and the little milk she gives is good for nothing. A veterinary-surgeon at Ottawa gave us some advice on this subject, saying that if we followed his counsel, the cow could be relieved in a few hours. When you see that a cow does not cleanse, leave her alone for 24 hours or even for two days. Then, wrap her up in a warm blanket, and poultice her with linseed. Get an ounce of ergot of rye, not in powder, but in its natural state; crush it, put it into a pan and pour upon it 3 half-pints of boiling water. Put the whole into two bottles, and give it to the cow in the morning, fasting; in 24 hours she will be completely cured.

Mr. McMurray—You will allow me to make a remark: at the Farm we never have any trouble with our cows. They should have rather laxative food before calving; a little bran, a thin mash. Not too much food; not too much hay; neither must they be crammed too full, as they will have to exert themselves to cleanse. Give them a little bran; a little linseed may be added, but not too much. Never give down calving cows any pease-meal.

Dr. Grignon—You have also been told about salting your cows. Experiments were made—at Ottawa I think—where ten cows were taken, 5 of which had salt given them, and the other 5 went without it. The latter fell off 14% in the yield of milk. And it is found that cows that have salt are never ill; their appetites are better, they drink more, and you know that the more a cow drinks, the more milk she gives, for 87% of milk is water. Besides, the cream of salted cows is more easily churned; the butter comes quicker.

I recommend saw-dust as litter for your cows; I have used it for 12 years, and have always been satisfied with it. I keep my straw for my cows; chaff it with clover-hay, and feed the cows with it.

(1.) Sometimes called the *heam*. A. R. J. F.

Thanks, gentlemen, for the attention with which you have listened to me. I hope that on another occasion we shall have a longer conversation. (Applause.)

CONCLUSION—THANKS.

M. l'Abbé Côté—Before closing this meeting, I must, not only in the name of the lecturers, but also in the name of the Dairymen's Association, thank the Board of Trade, His Honour the Mayor and the Town Council of Valleyfield, for the kind reception their care and attention have afforded us. I would that his Lordship the Bishop were still here, that we might thank him for the goodness he has displayed in being present at two of our sessions. I trust you will all preserve a good recollection of us ; so we will not say adieu, but au revoir. (Applause.)

M. Girard, M.P.—There has been omitted a resolution that the Association has been in the habit of passing every year : thanks to the officials leaving their posts. I think it would be right that this resolution be passed this year as usual.

Dr. Grignon—I second the motion. (The motion was carried unanimously.)

The Convention then adjourned.

The session closed with a set of magic-lantern slides, prepared to illustrate a lecture that M. J. C. Chapais was to have delivered at Valleyfield. Unfortunately, M. Chapais was kept at home by illness.

SUPPLEMENT TO THE REPORT OF THE CONVENTION.

THE HOG IN CONNECTION WITH THE DAIRY-INDUSTRY

By M. J.-C. Chapais, Dominion Assistant Commissioner of Dairying.

SUMMARY :

Introduction—Importance of breeding pigs as a complement of dairying—Markets open for the sale of pig-meat—Breeds for the production of salt-pork—Breeds for the production of bacon—Description of breeds—Special characteristics of each breed—Berkshires—Chester-whites—Poland-Chinas—Tamworths—Improved Yorkshires—Selection of breeders—Type of a good boar—Type of a good sow—Feeding, &c., of the boar—Of the sow—Farrowing of the sow—Feeding the sow while nursing—Feeding of the pigs up to weaning—Weaning—Feeding the sow immediately before and after weaning—Feeding the young pigs until putting up to fatten—A word on clover—Composition and value of fresh milk, skim-milk, whey, and butter-milk—Food for making salt-pork—Food for making bacon—Remarks on the cost of pork—The pig and cleanliness—Condiments—Antiseptics.

Introduction.—The present essay was made from some notes prepared for a lecture given to the students of the provincial dairy school at St-Hyacinthe, and at several meetings of Farmer's Clubs. As many of the students of the school and many members of the Clubs have asked me to publish these notes, I think it is my duty to do so, after correcting and amending them.

Importance of pig-breeding as a complement of dairying.—One of the industries complemental to dairying, that especially affects every farmer who is desirous of extracting from that business all it is capable of producing, is the breeding and fattening of swine. For indeed, of all animals of the farm, the pig is that which utilises, most profitably for the farmer, the residue or bye-products of the creamery and the cheesery, to wit: the skim-milk, the butter-milk, and the whey. Of course, these residues must be mixed with other kinds of food, for, alone, they would not give too satisfactory results, as regards the skim-milk and butter-milk, and the results would be even bad as regards the whey.

An experiment, often repeated by the breeders of prize-pigs in Ontario and the States, shows the great capacity of the pig for utilising in the best possible manner the residues of the creameries and cheeseries. It may be shortly described as follows: Three pigs, of the same breed, of the same litter and consequently of the same age, were the subject of this experiment, as regards the effects of food

Weighing each 100 lbs. at the beginning of the trial, one received 100 lbs. of skim-milk as its sole food, for several days, and with this support gained 5 lbs. in weight; the second ate a bushel of corn-meal, as its sole food, also for several days, and in the same time gained 10 lbs. The third received as food 100 lbs. of skim-milk as well as a bushel of corn-meal. Instead of gaining 15 lbs., during the period of feeding, in accordance with the proportion of gain by the other two, it showed a gain of 18 lbs., or 3 lbs. more than their combined gain. And, on the average, repeated experiments always have furnished the same results. This is explained by the fact that the taking into the stomach of the milk facilitates the digestion of such solids as are added, and enables the animal to assimilate a larger portion of the solids contained in its food.

Markets open for the sale of pig-meat—Breeding pigs, as a complement of dairying, is only profitable in proportion as the farmer who pursues it is perfectly acquainted with the outlets we possess for pig-meat, and the requirements of the markets as regards it. It is thus, for instance, that in the districts where lumbering is at its highest development, in the new centres of colonisation of our province, farmers find it pays to grow pigs for salt pork, to feed the shanty-men; while those in the older settlements, in the rural parts of the province, who have not that outlet, have to adapt themselves to the production of bacon, i.e., a smoked pork that is sent to the English market, a market that is open to take pig-meat, in the form of ham or bacon, to the amount of sixty-five millions of dollars a year. Now, fattening pigs for salt pork and for bacon are two very different things. In the former case, pigs of the smaller breeds, of early maturity and producing thick, very fat pork, have to be fattened on plenty of grain. In the latter, what is wanted is thin pork, meat mixed in alternate layers of fat and lean; pigs, the offspring of the large breeds, long in the flank, and killed when they do not average more than 200 lbs. as a minimum.

At Montreal and Sherbrooke, there are two firms that make bacon, and they complain that they are obliged to buy their pigs in Ontario or the States, because this province cannot supply enough of them. Our farmers, then, must turn their attention to this trade of providing pork for bacon, which trade is now open to them.

Breeds for producing salt pork—Among the numerous breeds of swine, there are three that are now invariably met with in this province, that are more especially regarded as yielders of pork for the packers: the Berkshire, the Chester-white, and the Poland-China.

Breeds for producing bacon—The large improved Yorkshire and the Tamworth are the two best breeds for bacon. A cross with either of these and the Poland-China, or even with the "Great Trotting, Razor-back," of this country, gives capital bacon-hogs.

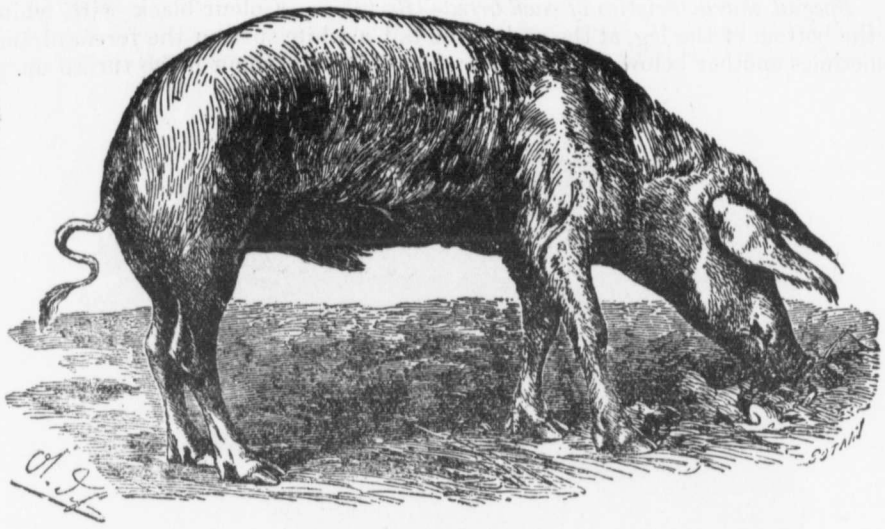

FIG. 1.—THE TROTTING-HOG.

There are many other breeds, each of which has its merits, but those mentioned, that are now commonly met with in the province, are enough for all requirements.

Description of breeds—Here, first of all, is a collection of the points that suits all the breeds just mentioned:

Head wide and short;

Lower jaw wide and very prominent;

Neck muscular and pretty long;

Shoulders wide but not open;

Legs, the front ones, straight, planted well outside the body;

Ribs deep and well rounded;

Loins wide;

Back quite straight;

Flanks deep and full;

Hams thick, with meat down to the hock;

Hind legs not too much under the body;

Bony frame, rather fine than coarse;

Hair long and silky, but without many bristles along the neck and shoulders.

Special characteristics of each breed—Berkshire—Colour black, with white at the bottom of the leg, at the end of the tail, a white spot on the forehead, and sometimes another below the shoulder; face dished, or snout much turned up.

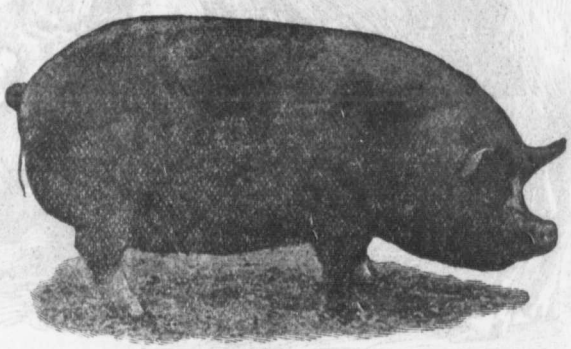

FIG. 2—BERKSHIRE.

FIG. 3—CHESTER WHITE.

Poland-China—Black, with white on the face, on the lower jaw, at the bottom of the legs, the end of the tail, and a few spots here and there on the body; general appearance, rather coarse; rather larger than the Chester-White.

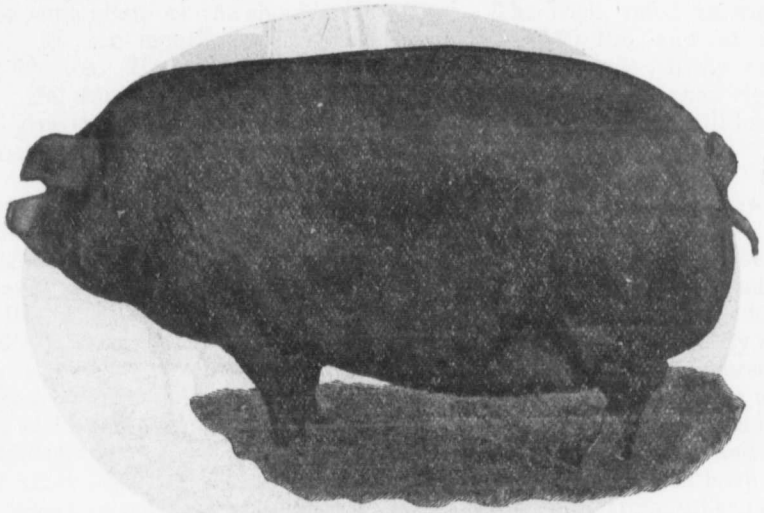

FIG. 4—POLAND-CHINA.

Tamworth.—Red; snout long; flanks very long; passes for the breed that gives the most lean-meat.

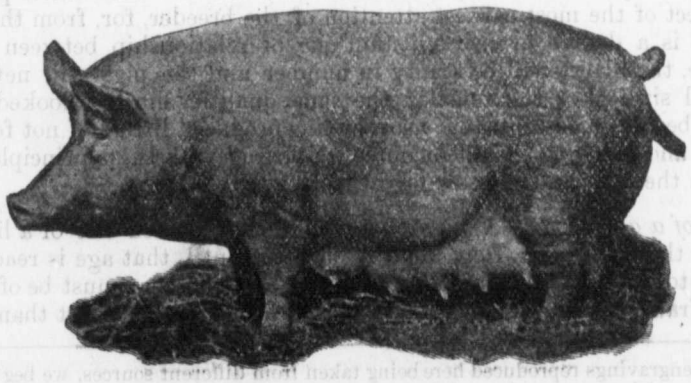

FIG. No. 5—TAMWORTH.

Improved Yorkshire—White; face very much dished; the snout very much turned up; very long in the frame, and very large at maturity. (1)

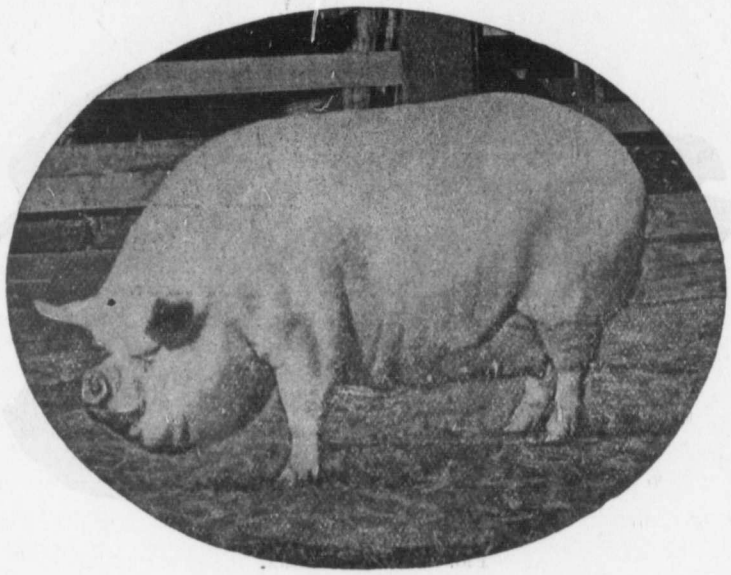

FIG. 6—IMPROVED YORKSHIRE.

Selection of breeding-stock—He who desires to succeed in the breeding of pigs, must scrupulously adhere to the rules that govern the selection of breeding-stock in every class of animals on the farm. These rules are, for the males: selection of the best type that can be found in the breed, absence of all infirmity of birth, descent from types of irreproachable breeding, perfect health, absence of all consanguinity with the female he is chosen to serve. This latter point must be the object of the most earnest attention of the breeder, for, from the moment that there is a degree, even if a distant one, of relationship between the male and female, the litters will be scanty in number and the pigs will never attain the normal size. For the female: the same qualities must be looked for as in males, and besides, a descent from a sow having produced litters of not fewer than eight pigs, and being an excellent nurse. Starting with these principles, here is that which the boar and the sow ought to be:

Type of a good boar—A boar should never be picked out of a litter until the pigs of that litter are four months old; for until that age is reached, it is impossible to tell what the animal is likely to be. The boar must be of middling size, well framed, with strong, straight legs, the neck rather short than long, the

(1) The engravings reproduced here being taken from different sources, we beg to say that they are not on the same scale, and do not present an exact idea of the proportionate size of the hogs of the different breeds.

body weighty and compact. Attention is to be paid in selecting him more to quality than to size. The shoulders should not be the weightiest part of the body, seeing that they are not the most saleable. The hams should be the most developed in proportion to the other parts of the body, and the flanks should lie in the same plane as the shoulder and ham. The back, must be wide and straight. At six months, the boar should weigh 150 lbs, and at twelve months, 300 lbs. He should be active but not troublesome ; lively but not vicious. He should be one of a numerous litter, of not less than eight, all of equal growth, for the pigs of which he is to be the begetter will have the same characteristics, as to number and growth.

Type of a good sow—A sow may be a little larger and rather coarser in the frame than the boar, if, in other respects, she has the proper qualities. Her constitution should be strong and robust, and she should be big enough to bear and feed a large litter. A sow is not to be called a good one unless she can supply a copious flow of milk for her piglings. Some sows, like some cows, are good nurses ; this quality is transmitted from generation to generation, and consequently, no sow should ever be set to breeding unless she come from a family of good nurses. She should be naturally quiet, for more than one pig has been lost by the mother being of an irritable temper, She should be one of a litter of not less than eight, and be the offspring of a full grown sire and dam. Vigorous health and a good appetite are indispensable; for, with 8 or 10 pigs to nurse, she will have to put all her digestive power to work to prevent the young ones from suffering from hunger and from wearing out the dam.

Feeding the boar.—For the first four months, the boar should be fed just as the other piglings, as will be described later. At four months, he must be completely separated from the females. He should then be put into a fold of about a quarter-arpent in extent, where he can take plenty of exercise. The fence round this fold should be very strong, so as to keep him in, for if he once gets out, it will be very difficult to keep him in afterwards. His food should be plentiful and made up of materials suited to the building up of his frame and muscles, without producing too much fat. Pease and oats, ground together, damaged wheat, are good foods, with skim-milk, and whey, but corn should be avoided, except in very small quantities. The object should be to keep the boar on growing, but not to fatten him. Do not let him serve any sow before he is eight months old—ten would be far better. A boar at too early an age is never a good stock getter; he only gets a scanty litter of pigs, that never reach their normal size, and he suffers in his own growth from having served too young. A small shed in his fold will give the shade he naturally needs. In winter, he is always kept apart from the rest, in a sty neither too hot nor too cold. When he serves a sow, more than one leap should never be allowed. The practice of leaving boar and sow together for a couple of days is wrong. One service ensures a better litter of better pigs, and the boar is not so much fatigued. I need not say that it is unnecessary for a farmer who keeps only two or three breeding sows to have a boar of his own. It is far better for a dozen of farmers in the same range to associate together and buy a boar of the best class, without regard to price, and for each to use him for his own sows.

Feeding the sow.—The sow is to have the same food as the other pigs until she is 4 months old, and should not be put to the boar until she is a year old, for the sow cannot bear and nurse properly a litter of pigs and, at the same time, keep on growing, without suffering from the exertion. Needless to say that, from 4 to 12 months, she should be kept away from all entire males. Before and during pregnancy, she should have the best of food, of a kind that will keep her increasing in weight, without running too much to fat. Oatmeal, spoiled wheat, bran, pollard, with skim-milk or whey, are all good for her, especially if she gets now and then a few turnips, mangels, or potatoes, the last three being boiled and not given too largely. Up to a week before farrowing, the sow ought to be allowed to run loose in an enclosure, where she can take exercise, provided it is in summer ; but in winter, if possible, she should have a sty large enough to allow her to move about freely.

Farrowing of the sow.—About a week before pigging, the sow ought to be put into the sty in which she is to bring forth, in order that she may get used to it. This should be clean, light, well ventilated, but without any draught, and fairly warm, if it happens to be cold weather. It is an excellent plan to put along all the walls of the sty a two-inch board, 10 inches wide, about 9 inches from the floor, to serve as a refuge for the pigs if the sow is likely to lie down upon and crush them.

The sow, in the sty, should be left quite quiet.

The quantity of food given to the sow should be greatly diminished, and its effects should be laxative, so as to keep the bowels open, which is the best way to prevent fever, after parturition. Sufficient straw or other litter is to be given her to make a bed for herself and the little ones, but the straw must not be long, otherwise the piglings run a great risk of getting entangled in it, which renders them much more likely to be crushed by the sow. Straw, cut into chaff, is the best of all. Parturition must be watched for, and for that reason the date of service must be borne in mind. The period of pegnancy runs to 114 days, varying from 110 to 120, according to the age and disposition of the sow. As the date approaches, the farmer should begin to take proper precautions to exercise the desirable supervision. One can tell when parturition is at hand by the sow beginning to make her bed. She turns the straw over and over, and makes heaps of it in different places.

The mother must not be disturbed by offers of food and drink, until she has quite finished pigging. No interference, except there seems to be a chance of one of the little ones being crushed, or if some accident occurs, such as cross-presentation of a pig, or two pigs coming to birth together. In such cases, aid must be given by the hand, previously well greased with oil kept ready within reach, in case of need. Three hours after it is all over, a drink of luke-warm water, into which have been put two or three handsfuls of bran, may be given; the feverish state of the sow during parturition always makes her very thirsty. It would be very risky to offer her anything to eat at this time; for, first of all, by troubling the sow's digestion, it might affect the quality of the milk, and

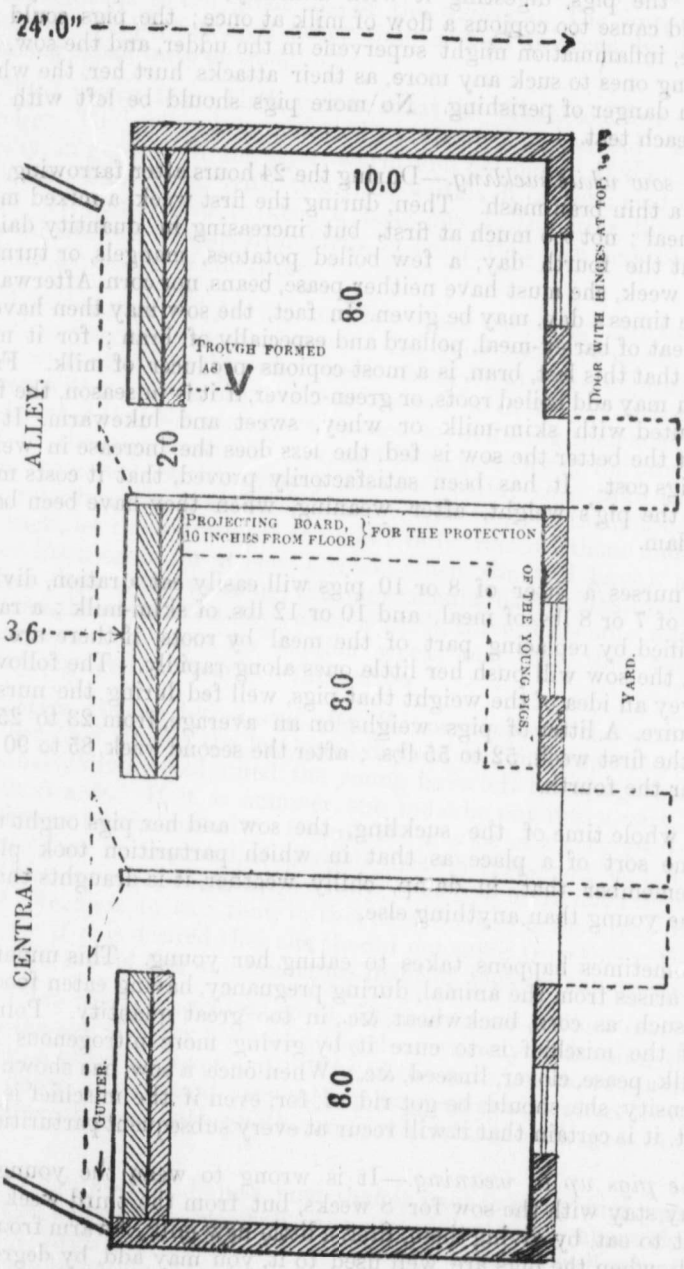

FIG. 7—PLAN.

PLAN OF THE PIGGERY.

THE FLOOR SHOULD HAVE A 3 INCH SLOPE TOWARDS THE GUTTERS SITUATED IN THE PASSAGE WHICH RUNS ALONG THE FEEDING THROUGHS.

a good many of the pigs, digesting it with difficulty, would probably die. Secondly, it would cause too copious a flow of milk at once; the pigs could not take it all, hence, inflammation might supervene in the udder, and the sow, not allowing her young ones to suck any more, as their attacks hurt her, the whole litter would be in danger of perishing. No more pigs should be left with the sow than one to each teat.

Feeding the sow while suckling.—During the 24 hours after farrowing, the sow should have a thin bran-mash. Then, during the first week, a mixed mash of bran and oatmeal ; not too much at first, but increasing in quantity daily ; and adding, about the fourth day, a few boiled potatoes, mangels, or turnips. During this first week, she must have neither pease, beans, nor corn. Afterwards, full rations, three times a day, may be given. In fact, the sow may then have as much as she can eat of barley-meal, pollard and especially of bran ; for it must not be forgotten that this last, bran, is a most copious producer of milk. From time to time, you may add boiled roots, or green-clover, if it is in season, the food being always diluted with skim-milk or whey, sweet and lukewarm. It is a settled thing that the better the sow is fed, the less does the increase in weight of the sucking-pigs cost. It has been satisfactorily proved, that it costs much more to increase the pig's weight, after weaning, when they have been badly nursed by their dam.

A sow that nurses a litter of 8 or 10 pigs will easily eat a ration, divided into three meals, of 7 or 8 lbs. of meal, and 10 or 12 lbs. of skim-milk ; a ration that can be modified by replacing part of the meal by roots, if there are any. Fed in this way, the sow will push her little ones along rapidly. The following figures will convey an idea of the weight that pigs, well fed during the nursing-time, should acquire. A litter of pigs weighs on an average, from 23 to 25 lbs. at birth ; after the first week, 52 to 55 lbs. ; after the second week, 85 to 90 lbs.; and 150 lbs. after the fourth.

During the whole time of the suckling, the sow and her pigs ought to be kept in the same sort of a place as that in which parturition took place ; and you must remember that, in damp, chilly weather, it is draughts that do more harm to the young than anything else.

A sow, it sometimes happens, takes to eating her young. This unnatural appetite always arises from the animal, during pregnancy, having eaten food too rich in carbon, such as corn, buckwheat, &c., in too great quantity. Pointing out the cause of the mischief is to cure it, by giving more nitrogenous food, such as skim-milk, pease, clover, linseed, &c. When once a sow has shown this unnatural propensity, she should be got rid of, for, even if the mischief is easy to guard against, it is certain that it will recur at every subsequent parturition.

Feeding the pigs up to weaning.—It is wrong to wean the young too soon. They may stay with the sow for 8 weeks, but from the third week they should be taught to eat, by giving them, first, a little new milk, " warm from the cow," into which, when the pigs are well used to it, you may add, by degrees, a little fine oatmeal. The sty must be so arranged that the pigs can get at this

food without the sow having access to it, for she would, if she could reach it, gobble it all up, to the great loss of the piglings. The important thing is to clean out the pig's trough every time a meal is given in it, to prevent its acquiring a bad taste or smell.

Two weeks from birth, means must be taken to allow the pigs to take exercise. The males are castrated at about 6 weeks old; the wounds heal quickly, in general, if the sty is warm and not damp. If they seem inclined to suppurate, wash them with two teaspoonfuls of carbolic acid in a quart of hot water. If you intend to keep a boar out of the litter, the cutting must be retarded till four months from birth, in order that you may be able to pick out the best developed of the litter.

Weaning pigs—Pigs are generally weaned too young; here they are rarely left more than four weeks with the sow. All good breeders agree that pigs should be left with her till eight or ten weeks from birth have expired. A good way to wean without doing any harm to the sow or to the young is this: of course it is understood that the pigs have learned to eat during their suckling-time. Take away all the pigs from the sow, and keep them away for twelve hours; then, restore them, and let them empty the sow's teats; then take them away for 18 hours, restoring them as before; after this remove them for 24 hours, take them back, let them drain off the sow's milk, remove them and do not let the sow see them again for at least a week, when she will have "gone dry." The first few days after weaning, the pigs should have a small feed of warm milk and oatmeal four times a day; after a week, three feeds only, a little larger each meal, always lukewarm, for another week, and, then, they can go on to the ordinary pig-food as described further on.

Feeding the sow before and after the weaning—If the sow is a very good nurse, her food, during the last three days of her suckling the young ones, must be gradually diminished, until the young have left her altogether and for a few days afterwards. If it is summer, she must be put into a very poor enclosure, and fed very parsimoniously. Should the sow be of a very good breed, and two farrows a year be required, if possible, from her, she may be put to the boar as soon as she comes into season, generally, that is, 8 or 10 days after the pigs are weaned. Needless to say that, in this case, no care is too great to be taken of a brood sow, if it is desired that she should not suffer from this mode of treatment, and bring a second fine and numerous litter of pigs the same season.

Feeding the young pigs up to fattening-time—When once the pigs have reached the age of 2½ or 3 months, the cheapest way of keeping them is to put them into a piece of clover and to add, if the milk goes to the creamery or to the private dairy, a thing that very seldom happens except where there is no factory near, skim-milk and butter-milk, or, if the whole milk goes to the cheesery, whey.

As to clover—I said, just now, that it paid to put young pigs into clover; seeing that, before long, we shall have a good deal to say about this legumen, as forming a large part of the food of the pig, I may as well say at once that, if there is any intention of feeding pigs on clover, preparation must be made before

hand. On land previously cropped with manured and hoed plants, must be sown ten pounds, at least, of the smaller red-clover, Alsike, and white-clover, and the best mixture is one of 15 pounds, made up of 10 lbs. of red-clover, 4 of Alsike, and one of white-clover, to the arpent; on an arpent sown thus, a year in advance, one can certainly cut two tons of hay, which are represented, as pig-pasture, by about 8 tons of green-clover. An arpent of clover yielding thus, if given as pasture to pigs, in folds of $\frac{1}{4}$ arpent each, to be fed down successively, may carry and feed 10 pigs for 3 months, if, as will be described later, skim-milk or whey be added.

Since this essay is written with a special view to the feeding of pigs on the waste of the dairy, and as this, in our province, is as yet only plentiful in summer, I pre-suppose that the farmer more especially devotes himself to the breeding of pigs that are farrowed in April or May.

Before speaking of the regular fattening of pigs, I will first give you some ideas as to the value of skim-milk, butter milk, and whey, as compared with whole-milk.

Composition and nutritive value of whole-milk, skim-milk, butter-milk and whey—Here, first of all, is a slight table that gives the comparison between them, as regards composition, of whole-milk, skim-milk, butter-milk, and whey:

	Whole-milk.	Skim-milk.	Butter-milk.	Whey.
	p. c.	p. c.	p. c.	p. c.
Fat	4.00	0.30	0.50	0.50
Casein and albumen	3.30	3.50	3.00	0.93
Milk Sugar	4.95	5.15	5.30	5.00
Ash	0.75	0.80	0.70	0.60
Total solids	13.00	9.75	9.50	7.03

According to the different pig-breeders in the States and Canada, and to the experiments made at the experiment-farms and stations, of the United States, the whole corroborated by the experience of our farmers, the proportions in which are employed the bye-products of the dairy just mentioned, with grain, clover, and roots, for the feeding or fattening of pigs, are pretty nearly those that I am about to lay before you. There is no question in these proportions of the exact chemical equivalents of the different foods mentioned; but a regular empirical valuation, that is, the whole is based on experience and not on theory.

Everyone seems to admit that $4\frac{1}{2}$ lbs. of mixed grains, given to a pig of 100 lbs., will add 1 lb. to his weight. Moreover, it is settled that a pound of meat is gained by substituting for it in the rations 5 lbs. of skim-milk and butter-milk or 10 lbs. of whey, or $4\frac{1}{2}$ lbs. of potatoes, or $5\frac{1}{2}$ lbs. of mangels, or 7 lbs. of turnips. With these data, it is easy to combine the rations so as to utilise the skim-milk butter-milk, whey, and roots with clover and the various meals, so as to make pork at the cheapest possible rate.

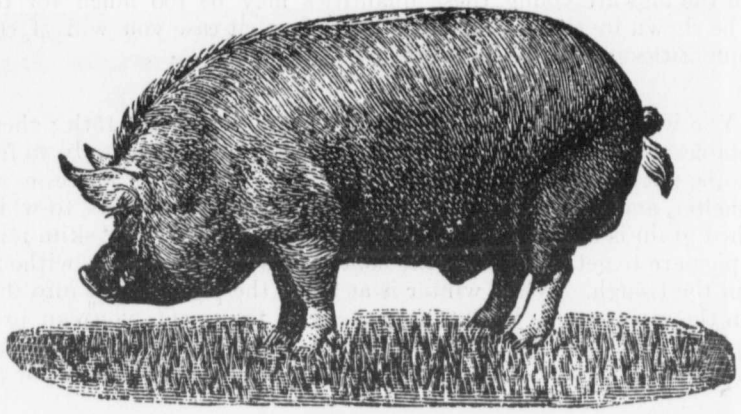

FIG. 8—PIG FOR FAT PORK.

Feeding for the packers.—I observed, just now, that pigs were put to clover at about three months old. If it is desired, next, to fatten them for the packers, their food must be changed, at 4, 5, or 6 months, according to whether they are to be fattened early or late. When employing the substances mentioned above to make up the rations, it must not be forgotten that too many roots make a soft pork, that in cooking melts away ; and, on the other hand, that the more grain is given, the dearer will cost the pork. Thus a certain proportion must be observed between the two kinds of food, and the ration is to be diluted with skim-milk or whey, which will greatly aid in making it economical.

The rule for feeding the ration is to give, thrice a day in summer and twice in winter, as much as the pig can eat without leaving anything in the trough. Numerous experiments have proved that cooking food, except roots, for pigs does not pay ; but it answers to give the food soaked, and, in winter, scalded, and to give it to the pigs warm, at, say, 96° F. The milk should not be sour, when it can be avoided, particularly if it is whey ; the fresher the milk the better. It must not be forgotten that, especially for whey, the greater part of the solids contained is sugar of milk, which, in souring, becomes an acid, and is lost as to feeding value.

Feeding for bacon.—If bacon is the object of the feeder, it will be in summer, while there is plenty of the bye-products of the dairy, that it will be found most profitable to produce it. I will therefore limit my advice to the practice at that season. When once the pigs are in clover, you will give them, every day, 12 lbs. of skim-milk or 16 lbs. of whey, at two meals, and as fresh as possible. A remark finds a place here : when the pigs are 4 or 5 months old, they will take much more milk or whey if they get the chance. But it is settled that the above quantities are the maximum of what the the pig ought to get if he is to derive the greatest good from it, and if the ration is to be well balanced as regards the other elements it contains. Neither must it be forgotten, that,

when the pigs are young, these quantities may be too much for them, which will be shown by there being some left. In that case you will of course lessen the quantities given at each meal.

You will feed your pigs in this way up to September 15th ; then, when the vegetables, roots, and potatoes, cabbages, turnips, etc., are ready to feed, the pigs are to be put in an enclosure, where they can get a little exercise, with a shed for shelter, and fed upon rations of boiled vegetables or roots, to which 2 lbs. of crushed grain is added for each pig, the whole diluted with skim-milk or whey. The pigs are to get as much of the boiled roots as they can eat, without any being left in the trough. When winter is at hand, the pigs are put into their sty, and fed in the same way. With this system of treatment, you can produce, very cheaply, pork neither too fat nor too lean, meat with alternating layers of fat and lean, not too thick, and this is the kind of pig-meat wanted for bacon.

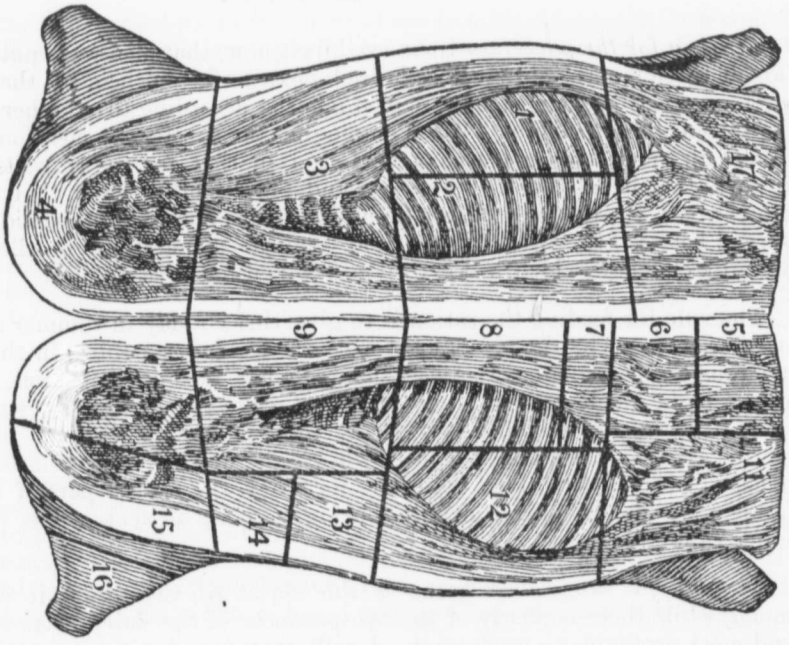

FIG. 9.—THE BACON CARCASE.

A bacon hog ought not to exceed 200 lbs., and this is about the weight, on the average, at 8 months of Yorkshires, Tamworths, or of crosses of these with the Poland-China, or with the great hog of the country, if they have been fed in the manner I have advised.

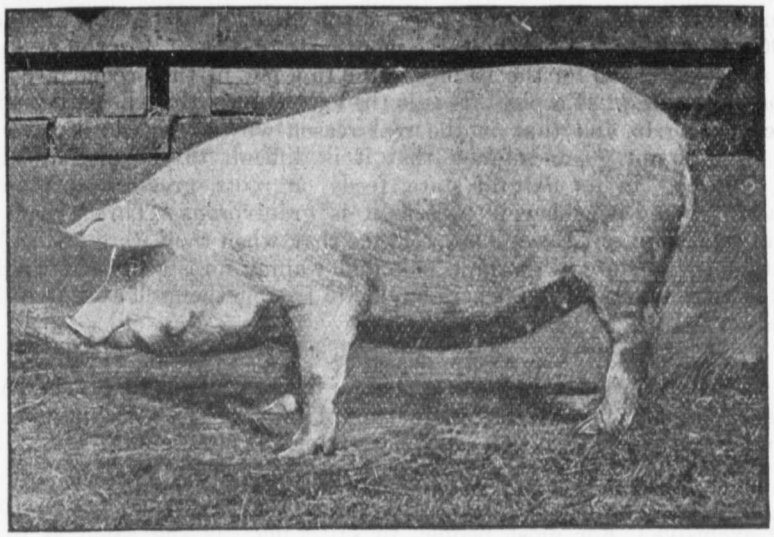

FIG. 10.—THE BACON HOG.

Remarks on the cost price of pork.—All the experiments in the fattening of pigs tend to prove that the older the pig the more he costs to fatten, that is, the more food is needed to produce a pound of increase. We shall see that the cost of production increases considerably with the age. In most cases, when the pig weighs 20 lbs. a pound of increase costs 2 cents; at 50 lbs., a pound costs 2½ cents; at 100 lbs., 3 cents; at 150 lbs., 3½ cents, and at 200 lbs., the pound of increase costs 4 cents. Over this weight, unless there is a source of food on the farm that costs mighty little, or in cases where the meat is sure to sell for an extra high price, profits are rare. This estimate is for pigs fattened for the pork-packers. On the other hand it has been proved that a bacon pig, killed as above mentioned, i. e., at 200 lbs., hardly costs 3 cents a pound for the carcase. There is nothing abnormal in this estimate of the cost of the meat of the bacon hog. Indeed, for three months, in the west of the Province, the pigs receive hardly anything from June 8th, and from June 25th in the east, but clover as pasture and skim-milk or whey.

Let us see what a pig costs during these three months. An arpent of clover that would yield two tons of hay would give, as pasture, 16,000 lbs. or 2 tons of green clover. A pig at pasture eats about 15 lbs. of green clover a day. During the first month he does not eat as much as 15 lbs., but in the last month he eats more, so the average of 15 lbs. is about right. Clover hay is worth $4.00 a ton at home. Eaten as pasture with no labour required, that is quite as much as it is worth. We have then, $8.00 for three months' keep for ten pigs on an arpent of clover. The ration of skim-milk for the ten pigs a day, 10 lbs. a head, or 16 lbs. of whey. Skim-milk is worth 15 cents the 100 lbs., whey 10 cents

Ten pigs, then, would use 100 lbs. of skim-milk a day, 3,000 pounds a month, or 9,000 pounds for the three months. Cost equals $13.50. Or 160 lbs. of whey a day, 4,800 a month, 14,400 for the three months—cost $14.40. In the first case, we have a cost of $21.50 for the 10 pigs, or $2.15 a pig, in the second, a cost of $22.40 for the 10, or $2.24 a pig. This is the extreme cost that the three months feeding can come to, and that is the real reason why bacon can be grown so cheaply. And do not go and fancy that it is difficult to get pigs to take to pasture. The hog, in its natural state, feeds on roots, grasses, acorns, nuts, beech-mast, etc., and is as herbivorous as it is granivorous. Three years ago, old men in the County of Essex, Ont., told me that, when they were young, hogs lived in a semi-wild state in the pine, oak and walnut forests of that country, and got fat there without the farmers having to trouble themselves to feed them all the season.

All that I have said about the cost-price of pork, tends to prove that to keep, as a good many farmers do, a great lot of pigs for twelve months eating a maintenance-ration, to turn them into barrel-pork at last, cannot pay.

The pig and cleanliness.—Here are two words that would seem to be mutually exclusive! For most people, to say "pig," is the same as to say "dirty." First of all, the fact that he will eat everything, even the things that seem to us the foulest, is only a sign that his digestive power is very great, and his tastes differ very much from those of some animals. Moreover, the chief charge brought against him, as to uncleanness, his delight in wallowing in the mud, is the strongest proof of his love of cleanliness. Give a pig a chance of bathing in pure water every day, and you will never see him wallowing in the mud. He needs a daily bath, and this explains the whole thing. Every warm-blooded animal dismisses, by excretion through the pores of its skin, the salts with which the blood is laden, and which escape with the sweat. This we find proved, when we taste a drop of our own sweat, that accidentally has run into our mouth. Now, with the pig, whose blood is very warm, the salts that escape through the pores of the skin adhere to it, among the hair, and this causes a sort of irritation that superinduces violent itchings. The pig soon finds out that water is the best cure for this, and he searches after it; if he cannot find any water, he puts up with mud, which has the same effect on him, and which, drying in the form of scales, carries off with it the irritating salts attached to the skin, and leaves it clean indeed. So, give your pigs plenty of water in the field. They will keep in better health, if they can freely bathe themselves. And in the sty, the pig should always have access to a pan of clean water, that he may drink when he chooses.

Condiments.—There is hardly a farmer who has not observed that, often toward the end of the fattening period, hogs lose their appetite, become listless, as it is commonly called. This may be obviated by letting them always have within their reach, a mixture composed of a bushel of charcoal, broken in small pieces, about the size of a filbert, ½ a gallon of slaked-lime, a ¼ bushel of hard-wood ashes and a quart of salt. Mix the whole well together, and sprinkle it

with 4 ounces of sulphate of iron, diluted with a gallon of water. The pigs will often take a little of this mixture, which will keep up their appetite, besides rendering them less susceptible to the attack of epidemics.

Antiseptics.—If the hogs of your neighbours are the victims of any contagious disease, whitewash all the sties with lime to which you have added an ounce of carbolic acid to each pail of wash, and put ten drops of the acid into every meal your give your pigs.

THE DAIRY-INDUSTRY IN THE COLONIES. (1)

By Mr. Samuel Lowe.

The subject we have on the programme for this evening is not an affair of high politics, like the Defence of the Empire or Imperial Federation and other grand questions, which so often occupy the attention of this Institute; it is rather a practical application of science and *savoir-faire* to one of the simplest and oldest of agricultural industries, which have occupied humanity from the pre-historic ages up to the present scientific era. The *raison d'être* of the "Royal Colonial Institute" is, if I understand it aright, to weld together, in happiness and prosperity, the different parts of our Colonial Empire and the mother-country. Of the numerous bonds that attach one people to another, there are none more effective than those forged on the anvil of commercial interests. When that noble and ideal union, *The Federation of the Britannic Empire*, shall have become a *fait accompli*, I doubt if any influence more powerful than that of trade will have contributed to that glorious event. So, though the subject I am about to treat may not, at first sight, appear to be of a very paramount character, I feel confident that, before we separate, I shall have convinced you that, before long, the dairy-industry in the colonies will occupy a very important position in the relations between those far-distant regions and the mother-country.

My aim is not so much to excite your interest, though I hope to show you that this point has not been neglected, as to place before you and our friends in the colonies a few important and practical suggestions for the development of the riches of a large portion of the population of Australia, New Zealand, and Canada.

Besides, I hope to win your sympathies and to fill you so full of enthusiasm that when you have left this hall you will exert your influence for the solution of the grand problem of supplying the 40 million inhabitants of this country with the dairy products of six colonies, in preference to those of the foreigner.

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(1) This lecture is taken from the "Journal of the Royal Colonial Institute," No. 5, April, 1897.

I do not aim at securing this by preferential or other tariffs, but simply by showing our colonists that they possess so many and such great natural advantages, that they are able to gain the lead in our markets by the most powerful of all commercial influences, *economy of production.*

In spite of the great interest that a sketch of the development of the *Dairy Industry in the Colonies* would present, I prefer rather to speak solely of its future expansion, as being by far the most practically useful way of treating my subject. Although the production of bacon, eggs and poultry may be the complement of dairying, I shall purposely omit it for want of time to treat it properly. However, it is necessary to refer briefly to the past.

In 1891, the number of cows in the then principal dairy-colonies of Australasia was 945,575, and in Canada, 1,857,112 ; the quantity of butter produced being 23,000, and 51,000 tons respectively. In Australasia were produced 6,700 tons of cheese, and 51.000 in Canada. In 1895, the figures had risen to 1,100,000 cows in Australasia, and 1,950,000 in Canada. The make of butter in Australasia reached 36,000 tons and in Canada 52,000 tons. There were 11,500 tons of cheese made, that year, in Australasia, and in Canada 68,000. So in the four years, the total number of cows in these colonies had increased by 247,350, or nearly 9%; the production of butter by 13,000 tons and of cheese by 21 800 tons. These figures do indeed prove that the people of these colonies have good right to be proud of the progress they have made ; but while respecting, as is only right, this legitimate feeling, I hope to be able to persuade them that they are capable of realising far greater progress in the future.

In 1896, the United Kingdom imported 151,897 tons of butter, estimated at 15,344,000 pounds sterling, and 112,227 tons of cheese, worth 4,900,000 pounds sterling, making a total import of 264,124 tons of dairy-produce, worth 20,244,000 pounds sterling. Of these enormous imports, the colonies furnished 15,368 tons of butter, worth 1,425,000 pounds sterling, and 64,472 tons of cheese worth 2,705,000 pounds sterling, or in round numbers 80.000 tons of butter and cheese worth 4,130,000 pounds sterling.

However welcome were these good results to us, if we consider the reverse of the medal, we shall see how vast is the field open to colonial energy. Foreign countries sent hither 136,525 tons of butter, worth 13,919,000 pounds sterling, and 47,755 tons of cheese worth £2,195,000, a total of 184,284 tons of dairy-produce, worth £16,114,000. From an abstract of these figures, it would seem that the colonies hardly supplied 10% of the weight of the butter imported by the United Kingdom, and less than 10% of its value. As to cheese, they furnished 4-7 in weight and less than that in value. These figures are very eloquent and afford an idea of the future possibilities of the wealth of our friends the colonists.

I intend to lay before you this evening a few of the *chief means to be adopted by the colonies* if they wish to acquire the bulk of this trade.

THE MILCH-COW OF THE COLONIES.

Throughout the greater part of the world, dairy-farmers have not devoted all the attention due to the breeding of no other cows than those that do best in the production of milk and butter. For this error, the Agricultural Exhibitions are chiefly responsible, and it is only in these few last years that prizes have been given to cows for the milk and the fat it contains, rather than for the beauty of their form and their aptitude for acquiring flesh. It is really astonishing to think of the vast ignorance that reigns on this point among farmers. Not one per cent. of them could state exactly the quantity of milk or butter supplied by his cows, separately or together, in a year ; and yet, it is upon this that 90% of his success depends, and it is imperatively necessary that the milkmen of the colonies direct their earnest attention to this point.

Milch-cows should only be kept for one of the following objects, that is : for the production of milk, or butter, or cheese, and according to the one of these that the farmer wants, should he select his herd. There are breeds of cows that are known to produce an abundant supply of milk ; others are celebrated for the richness of their milk in butter. If the object of the dairyman is the sale of milk, or the making of cheese, his herd should be selected from the breeds known to yield much milk ; but if he aims at butter-making, he should choose his cows from among the butter-breeds. Such are the two principal rules that should guide the dairyman in the selection of his herd. Before proceeding to the permanent establishment of his herd, he will have to ascertain, day by day, week by week, the yield of each of his cows individually. This is easily done : every day, or on a fixed day in each week, the milk of each cow should be weighed and entered into a book kept on purpose. The milk, too, should be tested for fat, and the result of the test recorded. By this means, the farmer would know the exact quantity of milk and butter each of his cows yielded, and would be able to discard the least remunerative, and retain the most profitable. A judicious selection of cows in this way, and a careful choice of the bull, would give the dairyman in a few years a very valuable herd, inasmuch as it would be peculiarly suited to his special object.

Let us now compare the yield of the cows in the colonies first, with that of cows in the United Kingdom, and next with a certain standard, that every herd ought to reach, that is, 600 gallons of milk, or 240 lbs. of butter yearly, by each cow. Many authorities have carefully calculated the annual yield of each cow in the United-Kingdom ; and among the most recent calculations we have those of Robert E. Turnbull and R. H. Rew. Professor Sheldon, too, has paid particular attention to this subject. Although the figures of these different authorities differ slightly, it may be considered proved that the annual yield of a cow in the United Kingdom is 454 gallons of milk or 180 lbs. of butter. This is far from being a high standard ; but we have reasons for considering it to be pretty exact. You would probably like to know the average yield of each cow in some herds ; I have the figures here, and they will show what great yields can be obtained by a judicious selection in breeding, and by proper attention to the method of feeding.

		Gallons
Sir John B. Lawes	42 cows, each	858
The Ontario Agricultural College	21 " "	608
The Norway herd, at Danvick	49 " "	620
R. H. Rew (a typical herd)	— " "	666
Experiment herd at Madison, Wisconsin, F. W. Woll	2,921 " "	610
10 dairies in Scotland, J. Spier	— " "	620

According to the official figures of the production of butter and cheese in the colonies, and estimating the quantity of milk consumed in its natural state by the calf and by the population at the same amount as in the United Kingdom, the average yields are as follows:—

New South Wales	247	gallons a cow.
Victoria	291	" "
New Zealand	330	" "
Canada	340	" "

These yields are rather surprising by their smallness, which, in comparison with the yields of the United Kingdom, is due to two facts: first, to the smaller dairy yield of each cow, and next to the lengthened period they are left dry for want of proper feeding in winter. If the cows in each of these colonies only attained to the standard of those of the United Kingdom, the increased annual value, with butter at 9d. a pound, that each of the colonies would be in a position to send us, would be:

New South Wales	967,709	L. S.
Victoria	1,137,876	"
New Zealand	513,800	"
Canada	3,334,500	"
Total	5,953,885	"

If we remember that, in 1896, the total value of butter imported from these Colonies, at 9d. a pound, only amounted to £1,332,962, it will be seen at once what a vast profit these Colonies failed to realise on account of the trifling yield of their cows, the annual loss, for each cow, being 54s. in New South Wales, 49s in Victoria, 37s. in New Zealand, and, in Canada 34s Such facts as these should urge the colonial dairyman to strive to staunch that enormous leakage in his business.

Taking, as a term of comparison, the standard of production suggested, of 600 gallons of milk and 240 lbs. of butter a year, let us calculate what would have been the increased profit for the Colonies in 1896, if the standard had been already attained there, as it is in Wisconsin, in the ten counties of Scotland, and in the above mentioned herds; and we shall find that if that increase had arrived here in the form of butter, at 9d. a pound, it would have amounted to the enormous sum of £13,000,000. (For details, see Appendix A.)

This estimate does not include the natural increase in the number of cows, which would add still more, it is unnecssary to say, to the increase of production.

IMPROVEMENT OF MILCH-COWS AND THEIR FEEDING IN WINTER.

From these observations on the yield of milch-cows in the Colonies, we may conclude that, if the colonial dairy-farmer desires to oust from the English market the products of the foreigner, he must modify his present system in two important points. First, a great deal more attention must be paid to the breeding of his milch-cows; and, secondly, he must adopt a system of feeding during the winter. As to the breeding of cows from the point of view of milk and butter, I think there is already in the Colonies an excellent stock of the best milking breeds Only a few years' practice in the judicious selection is needed to improve from the very foundation the existing herds. The Jerseys, Ayrshires, Holsteins and Shorthorns (Durhams), whether pure-bred or crossed, are not difficult to obtain. If an exact record were kept both of the quantity and the quality of the milk of each cow, and if all the inferior ones were discarded, the productive powers of the colonial cow would rapidly and enormously improve. The milch-cow should be kept for the production of milk and butter alone, and not only for her beauty. A friend, writing to me lately, remarked in strenuous terms: "A man may get on with a pretty woman, in spite of her faults of character; yes, with a pretty woman, but not with a cow."

Mr. John Frederick Hall, a landed proprietor of Somersetshire, in his evidence before the Royal Commission, proved, by records carefully kept, that his Jerseys paid better than his Shorthorns. Three Jerseys ate as much as two Shorthorns, and each three Jerseys returned him £15 a year more than each two Shorthorns. Taking as the average duration of milk-production, for each cow, a period of 4 years, this makes a surplus profit of £60 for each three Jerseys. Still, when these cows ceased to give milk, and were fattened for the butcher, the two Shorthorns gave him £12 more profit than the three Jerseys, which reduced the extra profit of the Jerseys to £48. Not that I mean by this to praise the Jerseys to the detriment of the Shorthorns, but I wish simply to show that, if the farmer does not keep an exact return of the yield of each of his cows, he can never know which of them pays best. The present system rests entirely on chance, instead of on good judgment and exactness. Each farmer should select his cows, in accordance with the circumstances in which he is placed, and the object he has in view. He must be the sole judge of the breed of cow that best answers to his wants, and the sole means for him on which to found his judgment, is to follow the method above indicated.

But, it must not be forgotten that in a herd of milch-cows, breed is not everything; the study of the best mode of feeding is quite as essential. Summer-feeding is simple enough; it is the winter-food for cows that demands the most work and the greatest skill in its preparation. A fact that seemed very strange to me, in my visit to Australia and New Zealand, was the entire absence of anything like the preparation of food for the cows in winter. Still, at the Agricultural College at Hawkesbury, New South Wales, the skilful president,

Mr. Thompson, who seemed well to understand the necessity of winter-food, showed me a silo full of splendid silage, made from corn and other fodders, that he had prepared for his cows. He told me that he was perfectly satisfied with the results of this feeding of silage to his cows. He was, at that time, earnestly trying to discover the best food for the production of milk and butter in winter.

I regret that I cannot give you the results of his experiment, but I can supply those of a very interesting and important experiment, made in Canada, with the same object, by Mr. Jas. W. Robertson, Dairy-Commissioner in that Colony. In an official report, he says that the silage he recommends is to be made in this manner:

"Half a bushel of horse-beans, mixed with the third of a bushel of corn, are sown or planted on an acre of land, in rows 3 to 3½ feet apart. When the cobs of the corn are glazed, the product of the two acres of mixture (which, being sown together, are naturally treated as one single crop) is cut and mixed in the silo with the heads of half an acre of sun-flowers. Two acres of this fodder of corn, beans, and sun-flowers, at 15 tons to the acre, will supply food for 1,200 meals, of 50 lbs. each."

This is as much as to say that this two acres of silage and the half acre of sunflower heads will keep a cow for 1,200, or 8 cows for 150 day. The cost of this silage is about $1 a ton. The sunflower heads are intended to supply the fat that is wanting in the corn and beans. (For the details see appendix B.)

The question of winter feeding is too vast to admit of my entering into more details, my time being limited. If the Australian Colonies would, however, attend to it, it would enable them to send great quantities of this butter to England in the months of September, October and November, the three months of the twelve in which butter realises the highest prices.

THE CONVERSION OF THE DAIRY INTO A MANUFACTORY.

From time immemorial, dairying has been conducted as a domestic affair; simple, needing but little practical, and still less scientific ability, for assurance of success in it. But the future will raise dairying to the rank of a trade of fermentation (?) like brewing and wine making, which require the combination of large capital with the soundest scientific and technical information. This subversion of the primitive methods and the substitution in their place of those which we have looked upon as novelties, have not, as yet, made much progress in the United Kingdom—though the movement is visibly increasing in Ireland—but, in some countries, as well as in the Australian Colonies and Canada, it is attaining vast proportions There are more than 450 creameries in Australia, in which 2,300 persons are employed. In Canada, the number exceeds 300 with nearly 1,500 employed. The home dairy business in the Colonies is rapidly vanishing before the factory methods, and in a few years all the butter and cheese will be made there in factories. The low cost of production in the great cotton and woollen manufactories has caused the hand-loom to be discarded, and the great saving in labour resulting from the establishment of dairy factories,

will apply equally to the domestic manufacturing of milk-products of the farm. We are not very far off that time now; before science was called in to help the brewer, more of our tavern-keepers either brewed their own beer, or got it from the local breweries. Now, all that is altered. Enormous breweries have been built, and have swallowed up the smaller ones, who found themselves unable to successfully cope with a more economical system of production united to the more uniform and reliable beer of the great breweries. It will be the same with the creameries and cheeseries. A more economical production, a greater uniformity and a superiority of quality, will be the factors that will place the factory system in a position to abolish the old methods. As an example of the truth of this, let us take the case of Ireland. The lowering of the price of dairy-goods that we have felt in the last few years had caused great injury to the Irish butter trade. It was observed that the factory-making of butter in Denmark and Sweden enabled the producers in these two countries to compete advantageously with the producers in Ireland. It was as a means of defence that the factory-making of butter was introduced into that country and, in spite of the numerous impediments it met with, it succeeded admirably there, and is spreading rapidly, indeed, over the whole country.

In Australia and Canada, this system is working well; but I am told that everywhere the severity of competition is driving the smaller factories to amalgamate, so as to reduce the cost of making, and to render more certain the above mentioned advantages. They are beginning to feel that the processes and the scientific apparatus, essential to the production of the best qualities of butter and cheese, by far exceed the capacity of these smaller factories. Although this absorption of the small establishments must in the end be truly beneficial, it will not proceed without causing much loss and trouble to a very great number of persons during the transformation, but the active competition that is fighting for the markets of the entire world will render this absorption inevitable.

THE MICROBE AND DAIRYING.

After having discussed the improvements to be made in the herds of milch-cows, as well as in their winter-feeding and in the certain development of the factory-method of manufacture, let us talk a little of the milk itself and its treatment, from the point of view of its conversion into butter and cheese. Drawn from the clean udder of a perfectly healthy cow, into a sterilised vessel, without contact with the atmosphere, milk would keep perfectly sound for weeks, and, possibly, for months. Milked as it usually is, and allowed to remain at rest for a certain time, it undergoes physical and chemical changes, which may make it nauseating to the taste, and utterly unfit for human food; and, consequently, the butter and cheese made from it will be equally disgusting. Not only does it sour, but it frequently acquires a great variety of smells, known in dairying as *taints*. The reasons why, in the first case, it remains sound, and in the second sours, etc., are that, in the first case, it is protected from bacteria or microbes, and that, in the second, it is unceasingly exposed to their action. It is owing to the development of bacteria in the milk that these changes take

place. This word, *bacteria*, I know will give a bad impression to many, probably, because it is always associated in the mind with disease, such as cholera, typhoid fever, etc. This is a pity, for many bacteria are highly useful, and may be considered as friends, for it is they that, with the yeasts, to which they are nearly related, give us the aroma and bouquet of our wines, and the various flavours of our bread and beer, as well as the aroma and flavours of our butter and cheese. Many people fancy that these bacteria are little tiny animals, crawling, wriggling, fidgetting about. There is no greater mistake, for they are not animals at all, but plants. The difference between them and the plants we see with the naked eye, is that bacteria are plants composed of a single cell, and have no green colour; while the ordinary plant consists of an unlimited number of cells, and contains *chlorophyl*, the green-colouring matter which is absent in the microbe. Having no chlorophyl, the bacteria cannot derive their food directly from the air and soil, as common plants do, but feed upon substances like milk, which originate from green plants. Their form varies greatly; some are spherical, like bullets; others cylindrical, like small upright, short sticks, with round, pointed, or flattened ends; others again are like bent sticks; but the first and last of it all is, that they are all plants. The bacteria of milk may be, almost accurately, divided into three classes: those that produce lactic acid; those that produce no apparent changes in milk; and those that curdle milk by producing a substance analogous to rennet. These three classes feed chiefly on the sugar of milk, and decompose it into different products, e. g., lactic acid, that imparts to milk its acid and coagulating properties, etc. In each class, there are different varieties, and each variety exerts a different effect on milk.

I told you what bacteria are, and how they live; now it is time to tell you whence they come and how they get into milk. Bacteria are to be found in every part of the world. The atmosphere is full of them, and the globe is covered with them. All vegetation is more or less overspread with them, and they swarm in lakes and bays. It is impossible to find a spot on the earth that is perfectly free from them. Those, however, that we are talking about this evening, are chiefly inhabitants of the air; they frequent hay and other cattle-food, stables and cowhouses, and delight in the dust and filth of the fields and sheds. Three conditions are essential to their existence and multiplication: moisture, a suitable temperature, and food. Just as the plants of the arctic regions flourish in the cold, and tropical plants in hot latitudes, so some bacteria enjoy such or such a temperature, and others enjoy another. The temperature that is most favourable to their growth and multiplication, varies from 80° to 100° F. Some thrive even at the freezing point, and others in a temperature as high as 150° F. Some can stand temperatures far below zero, while the germs of others are not even destroyed when the point of boiling water is reached.

The sources whence bacteria fall into the milking-pail are principally these:
The milk that remains in the teat of the cow after milking;
The filth and the hair on the cow's udder when she is being milked;
The hands and dress of the milker;
The pail and other utensils, if they are not properly cleaned.

The atmosphere of the place in which the cow is milked, and where the milk is kept afterwards, whether it be in the open air or in the cowhouse.

I stated that there were no bacteria in the milk as long as it is in the cow's *udder*, if she is perfectly healthy; but you must not imagine that the same holds good as to the milk in the *teat*. In the former case, it is hermetically sealed from the air, while the air having access to the drop of milk left in the end of the teat, impregnates it with bacteria, and, the animal warmth of the cow being just the thing for their development, the milk remaining in each of the teats soon swarms with them. In the first jets of milk that spirt from the teats, are found about 50,000 bacteria to the cubic centimètre of milk, that is about the contents of a thimble, while in the milk towards the end of the milking, there are not more than 500.

Even if I were to enumerate separately the other sources of contamination, it is the atmosphere that is the chief source. Thanks to the kindness of Prof. Russell, of the experiment-station of Wisconsin, I will presently show you on the screen, with the magic-lantern, (1) the importance of that source of infection. Professor Russell showed that, the cows being milked in the cowhouse during winter, there fell on an average, each minute, into a pail, ten inches in diameter, 5,300 bacteria. If the precaution had been taken to wash the cow's udder and the milker's hands, before milking, the number would be reduced to 1,300 a minute. In an analogous experiment, made in the open air in August, the diminution of the number of bacteria was 96 %. It is not unusual to give the cows hay just as the milking is about to begin, and when that is done the air is found to be loaded with dust and the spores of bacteria. Prof. Russell's experiments show that, under these conditions, more than 160,000 micro-organisms fall into the pail a minute, while if the milking is done under conditions of absolute precaution, the number may be reduced to 2,400 a minute; and the milk drawn in the latter case has kept sweet for 24 hours more than under ordinary conditions, the two milks being kept in the same room. It does not follow that, because so large a number of bacteria get into the milk, that on that account the milk will not keep. The preservation of milk depends entirely upon its subsequent treatment. If the milk were cooled down to a temperature hard upon 32° F., immediately, that is, within two or three minutes after its being drawn, it would keep for a very long time; because, at such a low temperature, the bacteria are reduced to inactivity, and rendered utterly incapable of multiplying. On the other hand, if the milk were carried off at once, heated up to 160° F., and kept there for 20 minutes, all the bacteria present would be destroyed and only a few germs would remain. If the milk, before it could get infected anew with bacteria, were promptly reduced to 50°, it would equally keep sound for a very long time. The chief causes of bad milk are: 1. the introduction of a great number of bacteria; 2. the high temperature at which it is kept; the latter cause being by far the most influential. The warmer the milk is kept, up to a certain degree, the sooner it spoils, because the bacteria develop more rapidly. The activity of the growth of the bacteria induces their rapid multiplication along with quick chemical modifications.

(1) See p. 282 of our 15th annual report.

THE SOURCES OF FLAVOUR AND AROMA IN BUTTER AND CHEESE.

Now that you know why sweet milk becomes sour, you will the more easily understand whence the aroma and flavour of butter and cheese are derived. My principal reason for detaining you so long on this subject of bacteria is, to show you that it is to them that we owe both the good and the bad flavour of butter and cheese. I hope to convince you that each distinct flavour or aroma is due to one species of bacteria, and, besides, that it is possible to isolate each of these species, and, thanks to them, to obtain any flavour or aroma we want.

In his studies on wines and beers, Pasteur discovered the bacteria that cause wine and beer to turn sour. He also found out that by heating those liquids up to a certain point, it was possible to destroy all these baneful vegetable growths. This process is called, after its inventor, *pasteurisation*. Dr. Hansen has pushed Pasteur's invention still further. He isolated the species of yeasts, which are plants of one cell like bacteria, and he found that each species gave to beer its flavour George Jacquemin, and other French vineyardists, applied Hansen's discovery to the making of wine, and found that each wine-yeast gave to wine a peculiar aroma and bouquet. Later researches have demonstrated the complete exactitude of these discoveries, proving thus that in the making of wine and beer, it is really possible, by a minute selection of yeasts, to produce any desired flavour or aroma. Following up Hansen's work, Professors Storch of Denmark and Weigmann in Germany, quickly identified one of the bacteria of milk as the producer of lactic acid, and have cultivated it on a large scale for the making of butter.

Still, it was (1) Lister who was the first to isolate one of these organisms. After some research, the sale began of this lactic acid, in a liquid form, to butter-makers, to be added to the cream to produce in the butter that generally liked aroma. It was soon discovered that in a liquid form, lactic acid could not be carried long distances ; so it is now to be had in the form of a white powder ; and in Denmark and Sweden to-day, 90°/₀ of the butter is made with cream fermented by means of this lactic acid in powder. I think, however, that the powder contains more than one variety of bacteria productive of lactic acid, and is, consequently, a mixture rather than a pure culture. Prof. Conn, of the Wesley University, Con., announced, two or three years ago, that he had found a variety of bacteria, that alone gave to butter its aroma. Prof. Russell, of the University of Wisconsin, has thrown a doubt on the discovery of Conn, and opposed its claims to the possession of the asserted properties. Conn also laid claim to the discovery of a bacterium that imparts its aroma to butter, but adds no flavour to it. At any rate, before sowing Conn's bacteria (B. 41), or lactic acid in powder, in the cream, it would be better to pasteurise it for this operation destroys all useless or injurious bacteria, and gives to those favourable to the ripening of cream a free field for their development. The flavours then are due to bacteria, and each variety of bacteria communicates its peculiar aroma. As a proof of the exactitude of this doctrine, let us take the case of what is termed turnip-smell.

(1) Sir Joseph, the scientist, not our Dursley friend. A. R. J. F.

After having studied the works on bacteriology, I felt convinced last year that the smell of turnips was due to a bacteria and not at all to the fact that the cows were eating turnips. This was shown by Prof. Storch, of Denmark, to be the case. I wrote to him on the subject, and in his reply, which I only received recently, he expresses himself thus:

As to the smell of turnips in butter, I beg to say that, 1. Milch-cows fed on turnips, especially when these are fresh pulled, give a milk that, after our experiments here, communicate a smell of turnips to the butter, when the milk has not been pasteurised; 2. The smell of turnips in butter has, doubtless, as a general rule, its origin in bacteriological causes. It has been proved here that cows that have eaten no turnips have supplied milk to the creameries that gave the smell of turnips to the butter; 3. We have, in my laboratory here, recently isolated and cultivated a bacterium that imparts the smell of turnips to butter.

This discovery of Prof. Storch appears to have an enormous scope, for it throws open to the dairy-trade an entirely new world. Not only does it show that the pasteurising of cream expels the most undesirable flavours from butter, but it seems to indicate that, in future, all kinds of aromas will be under the control of the erudite maker. By pasteurisation, he will be able to abolish all the forbidden aromas, and by culture of good bacteria, he will be competent, either with pure cultures, or with a mixture of them, to impart to the butter the flavour and aroma he wants it to possess. There will be in this, most assuredly, an immense progress made in the art of butter-making.

Such is the point up to which science, in our days, has unravelled the mysteries of the bacteriological problem connected with butter-making. As to cheese-making, Mr. Fred. Jas. Lloyd has been, in our own country, pursuing, now for some years, a very important series of researches, relative to the making of Cheddar cheese, and, a still more important point, on the diseases connected with that art; and I hear that he has exhausted that subject, as far as regards the chemical point of view. Thanks to his great kindness, I can show you this evening, on the screen, some of the types of bacteria that are useful in the making of cheese, and some that are injurious. His work is in the highest degree important, and will put cheese-makers throughout the world in a position to produce a far better article than they have ever done. He has proved, beyond all doubt, that the different aromas in cheese are due to certain forms of bacteria, and that if the cheese is not perfect, the fault lies as often in the milk as in the maker.

PASTEURISING AND STERILISING.

As soon as it was really known why milk and cream turned sour, or why their aroma was otherwise impaired, experts set to work to discover means for the destruction of the bacteria, without at the same time injuring the quality of the milk. Several chemicals were tried, but not one but had its inconvenience, As to methods for keeping milk and cream, there are none that, up to the present. surpass in efficiency pasteurising and sterilising. This latter process is never employed unless it is desired to keep the milk or cream for weeks or months.

Although acting on the same principle, the two processes differ by the point to which they are pushed. In both, heat is applied to the milk or cream, but to different degrees. In pasteurising, the temperature must be raised to 150° to 175° F., and maintained there for about 20 minutes, to destroy the active bacteria present. In sterilisation, the temperature must reach or overpass 212° F., the boiling point. In sterilisation, the objection lies that it gives a taste of having been boiled to the milk. In pasteurisation, if the process is well conducted, no difference in taste is perceptible. (1). As the two processes realise the objects sought, of preserving the milk perfectly sweet for a far longer time than it otherwise would be, it is clear that, in dairy practice, pasteurising is preferable to sterilising. The great advantages of treating cream by pasteurising if it is intended for butter, does not as yet appear to have been much recognised in the Colonies. In Demark and Sweden 90% of the butter exported is made from pasteurised cream. In Australasia, during the very hot season, it is necessary to have recourse to pasteurising. Artificial cooling cannot repair the injury done to the milk and cream by the previous development of microbes; it can only prevent further injuries. If the evening's milk has not been rapidly cooled and kept all night at a low temperature, it swarms with bacteria when taken to the pantry in the morning, and among them there will be many injurious ones; so the cream ought to be carefully pasteurised, that is, that not only should the bacteria not be allowed to develop themselves more fully, but they ought to be put to death at once. If the maker allows the cream of one single farmer, swarming with bad bacteria, to mix with the sweet cream of his other patrons, he will soon see that the proverb: "to grow like weeds," applies as well to a vat of cream as to a garden.

Allow me now to explain to you how it is that pasteurising it preserves milk sound so much longer. It may be considered that the multiplication of bacteria in general attains its minimum of intensity at 50° F., and its maximum at 113° F. Between these two degrees, they multiply at different degrees of rapidity. Thus, if bacteria can exist at temperatures varying from 160° F. to below zero, they can only multiply between 50° F and 113° F.; and the most favourable temperature is that from 86° to 100° F. Whence it follows, that, if milk is kept at a temperature below 50° or above 113°, the bacteria it contains cannot multiply themselves, although those already existing may between these two degrees continue the conversion of the sugar of milk into different acids. Whence, again, we conclude that, if the milk already is swarming with bacteria, it were better to raise the temperature to a degree competent to destroy the whole lot at once; this temperature, we saw just now, is 150° and upwards. Hence given the temperature of pasteurising at from 150° to 175°. Higher than that, is likely to give the milk the "cooked taste," to which we have already referred. At 150°, it will take longer to kill bacteria than at 175°. At 155°, 20 minutes will do it; at 160°, 15 minutes; at 165°, 10 minutes, and so on. Pasteurising, however, will not destroy bacteria in all their forms; it will only

(1) May I be forgiven if I say that all butter made according to the well known *Devonshire* practice, is from pasteurised milk; the milk is raised to about 170° F., and if that is done in a "*bain-marie*," i. e., in a pan of water on the fire, there is positively not the slighest taste of cooking. A. R. J. F.

kill those that multiply by scission; not those that reproduce themselves by spores, and are, hence, the most difficult to destroy; indeed, nothing but sterilising will effect this. So here we find ourselves confronted by a great danger. Unless the pasteurised milk be at once reduced to a temperature at which the spores become inert, pasteurising is a very hazardous process, for, in all probability, it will destroy all the bacteria of the favourable species, and leave only the dangerous ones. If, therefore, we wish to obtain the best results, we must practise artificial refrigeration in conjunction with pasteurisation.

DAIRY EXPERIMENT-STATIONS.

During my stay in Australia, I was vividly impressed with the absence of dairy-schools and dairy experiment-stations, with which all the countries of the world, except our own, have been endowed by their Governments. The United States, Canada, Denmark, Sweden, Germany, France, Holland, Switzerland, Finland, all these have dairy experiment-stations or schools; most of them have both. Our Australian Colonies have the most pressing need of these institutions; without them, it is absolutely impossible to carry on a trade so scientific as is dairying, with as much success as if they existed. In this branch of production, as in all others, knowledge is power! It is in a great measure owing to these schools and experiment stations, that foreign countries have been able to supplant the English farmer in his own market. Nothing can more clearly show the natural advantages possessed by our Australian colonies, than the fact that, without the aid of such establishments, and, so to speak, without the assistance of any technical instruction in dairying, they have succeeded in producing butter of the very finest quality. Still, the advantage of such institutions is emphatically shown by the example of Finland, a country which, from its climate, may be considered to be the worst suited in the world to dairying. But it possesses 13 dairy-schools, and one or two experiment-stations, and last year it exported 14,000 tons of butter, while in 1892, it only exported 8,000. Besides, the quality of its butter is improving year by year.

To give you an idea of the work done by these stations, I will quote a list of experiments carried on in one of them, that of Madison, Wisconsin, U. S. The report of 1892 mentions, among others, the following, belonging especially to dairying:

100 American rations for milch-cows;

The comparative value, as food for milch-cows, of linseed-meal, corn-meal, and wheat-bran;

Experiments in cheese-making.

The sources of bacteriological infection, and their relation to the qualities of keeping milk;

The infectious properties of the milk of tuberculous cows;

Tests of milch-cows;

Effect of salt on cheese ;

The fat globules in cow's milk ;

All these chapters of the report are printed separately, under the form of bulletins, and are distributed gratis to farmers in the state of Wisconsin. Independently of these bulletins, there are others for each branch of experimentation, which are also distributed as above. The commercial advantages of such means of instruction are incalculable ; and none other of the means that our colonies could take to develop dairying among their people, could have half the usefulness of these institutions. Canada, fortunately for herself, is well endowed with them, and it is to this that I do not hesitate to ascribe the remarkable development that has been made by our *par excellence* cheese-colony.

A MODEL-ESTATE, FROM THE POINT OF VIEW OF THE DAIRY-INDUSTRY.

(In spite of the slight interest apparent to farmers of the Province of Quebec of the following information on the Berry-estate, we determined to put it before them. That which has been done in New South Wales by the energy of a single man, co-operation, well conceived, and practised intelligently, might do here to advantage ; if the time has not yet arrived to speak effectively here of such methods, it is not the less interesting to note from to-day this fortunate attempt at the complete factorisation (*industrialisation*) of the production of milk and the manufacture of butter.)

Although the Australasian Colonies have no dairy-experiment-station, New South Wales is fortunate enough to possess a private estate, that, as regards dairying, is probably as well situated as, and better organised than, any one in the world. I am speaking of the Berry-estate, the property of Dr. John Hay. Situated on the sea-shore, about 8 miles south of Sydney, with a frontage of about 20 miles on the Pacific, it extends in its greatest depth towards the interior to a distance of 10 miles. At first, a great part of the estate was covered with a marsh, 20,000 acres of which are now cultivable. During the last three years, Dr. Hay has spent £130,000 for the improvement and arrangement of his estate. The greater part of the domain is now in fine farms, once covered with thick woods, but which now yield heavy crops of maize and hay. The more elevated parts are still in forests of superb trees ; but all the land susceptible of cultivation has been cleared by Dr. Hay for the use of his settlers. The climate is very healthy ; the rainfall is abundant. The estate is well watered, and is crossed by a railway to Sydney, with which town it is also connected by a service of coasting-steamers. Thus, to the natural advantages of fertility, that of easy communication both by sea and land is united. The estate measures more than 70,000 acres ; already, more than 500 settlers are planted there, with more than 15,000 cows, whose annual production exceeds £80,000, in butter. This is an average that greatly exceeds that of the rest of the Colony, for the district is already famous for its capital dairy-cattle, the origin of which goes back to the efforts of Dr. Hay's deceased uncle, Mr. David Berry, who imported from the old country several head of the best breeds of milch-cows. Two years ago, Dr. Hay began the erection of a vast creamery at Berry, the central point of the estate. His brother, Mr. Alex. Hay, came to Europe, and visited the principal dairy-centres, both in United Kingdon and in Denmark, Sweden, Germany and France, with a view to gain familiarity with the newest and most scientific methods of making butter, and of buying the most

improved modern utensils and machinery for the dairy. He returned full of information, bringing with him half a dozen of the best Jerseys that he could find. It is, in great part, to his energy, enthusiasm and intelligence, that the arrangement of the estate, so rapidly brought about, is due. Dr. Hay has spared no expense in the construction of his creamery, where will be found the best machinery and all the most modern improvements; it is now one of the most perfect creameries in the world. In December last (our Canadian June), more than 120 tons of butter were made there. On the estate and its borders, there are, besides, 13 skimming-posts, that send their cream to the central factory at Berry. To each of these posts, the neighbouring farmers take their milk, and, after it is skimmed, return home with the skim-milk, to be used on their farms. They are paid full market prices for their milk, less the cost of making the butter, and according to its contents of fat; the money is paid over to them monthly. Every day, the posts send their cream to the central factory, where it is ripened in vats containing, each, 500 gallons. In these vats are placed ranges of pipes through which runs water the temperature of which is regulated at will. These ranges of pipes, by an ingenious mechanical contrivance, move slowly from side to side of the vats, and this movement ensures the uniform ripening of the entire bulk of cream. The cream, thus ripened, is placed in three great square churns, each of which turns out a-half ton of butter at a churning. There are in this factory 4 steam-engines, one of 40 horse power for the work of the refrigerating plant; two provide motive power for the work of the factory proper; and the fourth is kept as a reserve in case of accidents. After churning, the butter is put on the butter-workers, circular turn-tables 8 feet wide, that work 900 lbs. of butter at once. After having been well worked, the butter is put into the refrigerating room, and that intended for export is packed in boxes of 56 lbs., which are stored in a refrigerating-receptacle, until they are despatched, which takes place once a week, at night, in isolated cars, cooled with ice, that take the butter directly to the port of Sydney, where it is shipped in refrigerating compartments on board steamers on the point of starting for London. The cream-room, working-room, and the butter-store, are all provided with a system of refrigerating apparatus for the maintenance of the proper temperature. During three or four months of the season, 30 tons and upwards of butter are made every week.

At Coolangatta, where he resides, Dr. Hay has recently established a factory for condensed milk, with a herd of 500 cows. There they can condense 2,000 gallons of milk a day. The herd is composed of Jerseys, Ayrshires, Holsteins, Shorthorns, and it includes a few cows of the native breed, the Illawarras. Dr. Hay rears thoroughbred cows and tries different crossings. The milk of each cow is weighed daily; the weight is entered opposite the name of each cow, as well as the daily ration she receives. Once a week, the milk of each cow is tested. Scientific experiments on foods are tried; for winter, there is a provision made of about 1,000 tons of silage, 500 of hay, and a vast variety of other fodder.

The erection of the creamery and the condensed milk factory, as well as all the experiments relating to them, have for their first object the benefit of the tenants of the estate. The rents vary according to the quality of the land; some

of the farms let as high as 30 shillings an acre a year. That a farm never remains unlet, is a pretty good proof of the success of the management; every farmer leaving has always a friend to offer as his successor.

CONCLUSION.

In conclusion, I hope I have shown you how brilliant a future awaits our Colonies from the scientific practice of the dairy-industry, and I see no reason to prevent the mother-country, in a few years from the present time, from deriving the bulk of her imports of butter and cheese from her own Colonies.

In order, however, to reach this, I trust that my essay will make our friends of the Colonies understand the necessity of their :

1. Improving their herds of cows ;
2. Adopting a system of proper feeding in winter ;
3. Concentrating the making of butter and cheese in large, well arranged factories ;
4. Studying with care the latest discoveries in bacteriology ;
5. Adopting generally the system of pasteurising, and
6. Establishing dairy-schools and experiment-stations to ensure the development of the technical education of all who engage in this industry. (1)

APPENDIX A.

PRODUCTION OF MILK, BUTTER, AND CHEESE IN THE COLONIES.

Table I.—The number of cows, annual yield of milk per cow, and production of milk, butter and cheese in the under-named Colonies of Australia and Canada for 1895 :

COLONIES.	Number of cows.	Annual yield of milk per cow.	Production of milk.	Production of butter.	Production of cheese.
		gals.	gals.	lbs.	lbs.
New-South-Wales	358,411	274	98,362,677	23,295,512	2,938,785
Victoria.....	465,389	291	135,579,622	35,580,201	4,153,131
New Zealand.....	276,237	330	90,867,210	18,275,062	16,932,200
Canada.....	1,950,000	340	663,000,000	116,918,752	155,154,813
Total.....	3,050,037	308	987,809,509	194,069,527	179,178,929

(1) This lecture was illustrated by magic-lantern slides relating to the latest discoveries in bacteriology in connection with dairying, to the butter and cheese factories, the cattle, landscapes, &c., in Australia, New Zealand and Canada.

Table II.—Annual increase on the present production—the whole of which might be exported—if the cows in the Colonies gave as much milk per cow, and per annum, as those of the United Kingdom, i. e., 454 gallons.

COLONIES.	Number of cows.	Increase.			Total increase in value at 9 d. a pound.	Increase in value per cow.
		Per cow.	Total in milk.	Total in butter.		
		gals.	gals.	lbs.	£	£ s. d.
New-South-Wales	358,411	180	64,513,980	25,805,592	967,709	2 14 0
Victoria	465,389	163	75,858,407	30,343,362	1,137,876	2 9 0
New Zealand	276,237	124	34,253,388	13,701,355	513,800	1 17 0
Canada	1,950,000	114	222,300,000	88,920,000	3,334,500	1 14 0
Total	3,050,037	145	396,925,775	158,770,309	5,953,885	2 3 6

Table III.—Annual increase on the production—the whole of which might be exported—if the cows in the Colonies gave an annual average of 600 gallons a cow.

COLONIES.	Number of cows.	Increase.			Total increase in value at 9 d. a pound.	Increase in value per cow.
		Per cow.	Total in milk.	Total in butter.		
		gals	gals.	lbs.	£	£ s. d.
New-South-Wales	358,411	326	116,841,986	46,736,794	1,752,630	4 17 0
Victoria	465,389	309	143,805,201	57,522,080	2,157,078	4 12 0
New Zealand	276,237	270	74,583,990	29,833,596	1,118,759	4 3 0
Canada	1,950,000	260	507,000,000	202,800,000	7,605,000	3 18 0
Total	3,050,037	291	842,231,177	336,892,470	12,653,467	4 7 .

Table IV.—(1) Annual production and export of butter in 1895 ; (2) quantity of butter that the four Colonies might have exported, had their cows given an average of 454 gallons a cow ; (3) quantity of butter the four Colonies might have exported, had their cows given an average of 600 gallons a cow.

COLONIES.		Present annual production of butter (1895).	Exportation of butter.	Quantity for export if the cows gave yearly.	
				454 gall.	600 gall.
New-South-Wales		23,295,512	2,028,349	27,833,941	48,765,143
Victoria		35,583,201	25,637,262	55,980,624	83,153,342
New Zealand		18,275,062	6,727,392	20,428,747	36,560,998
Canada		116,918,752	3,650,258	92,570,258	206,450,258
Total	In lbs.	194,069,527	38,043,261	196,813,570	374,935,741
	In tons	86,638	16,983	87,862	167,215
	In value at 9 d. a lb.	£ 7,277,592	£1,426,572	£7,380,408	£14,045,960

APPENDIX B.

MIXTURE FOR THE SILO—HOW TO PREPARE IT.

By Jas. W. Robertson.

The object of the new Robertson-mixture for ensilage was to combine the respiratory elements (those that serve to keep up the animal heat), the plastic elements, (those which serve to produce lean meat) and fat, so that the cow might at each meal of silage find a perfectly balanced ration. In this new mixture, there are maize, horse-beans, and the heads of the sun-flower ; a perfect combination is thus obtained, competent to impart to the cattle all the nutritive elements requisite.

Maize—the great solar plant of America—is without contradiction the most useful of the crops intended for ensilage, but however well preserved it may be as regards its succulence, smell, its flavour, and its colour, it is always an incomplete food for stock. With its marvellous facilities for the extraction from the elements of the air, starch, gum and sugar, corn becomes a real storehouse

of heat, power and energy. Its carbo-hydrates (respiratory elements) are largely in excess of its albuminoids, (plastic elements.) The latter are, however, present in considerable quantities per acre in the fodder of corn; but for wholesome, economical and complete food, they are out of desirable proportion with the other elements.

The horse—or small field-bean *(faba vulgaris, var. equina)* seems made expressly for the completion of maize. This plant has a stalk, straight, stiff and 4-square in form. It grows to about three or four feet high, and in England and Scotland, even from three to six feet. The pods start from the stem at six or eight inches from the soil, and continue up to the top. The beans, when ripe, are a sort of grayish brown in colour, and oblong, tending to round in shape, being about ½ an inch long and ¾ of an inch in width.

Although the albuminoids and carbo-hydrates (in the form of starch, gum, sugar and fibre) may meet in a mixture of corn and beans, nearly in the proportions necessary to make a complete food, there is still something wanting; there is not quite fat enough in it. The sunflower *(Helianthus annuum)* succeeds famously in the whole of the temperate zone of this continent, and its seed contains a large proportion of fat. The variety known as the "Russian Giant" was grown in rows 3 feet apart, with 3 to 18 inches space between the plants in the rows. The distance in the rows between the plants did not seem to make any difference in the yield, which was 7½ tons to the acre. According to Mr. Shutt's analysis, the crop contained 352 lbs. of albuminoids and 725 lbs. of fat to the acre.

Half a bushel of beans and a third of a bushel of corn will sow an acre in rows 3 to 3½ feet wide. It is cultivated just like fodder-corn. When the maize is beginning to glaze, the yield of 2 acres of the mixture (treated as one crop) is cut and put into the silo with the heads of a half-acre of sunflowers. These heads are easily cut off with a common sickle, and then carried to the chaff-cutter to be chopped up with the beans and corn.

The following table gives the quantities of nutritive elements contained in a crop of 2 acres of beans and corn, grown together, and half an acre of sunflowers (the heads alone.)

	Albuminoids.	Carbo-hydrates.	Fat.
	lbs.	lbs.	lbs.
Corn : 15 tons an acre, or 30 tons	1,092	10,302	324
Beans : 4.5 tons an acre, or 9 tons	490	1,361	125
Sunflower-heads : 7.5 tons an acre, or 3.75 tons	176	1,186	364
Totals	1,758	12,849	813

Two acres of fodder-corn, at 15 tons to the acre, will supply 1,200 single meals of 50 lbs. each. The albuminoids of the beans and the sunflower heads are equivalent to a quantity of mixed grains, sufficient to allow 4½ lbs. of it to each of the 1,200 meals. It is hoped that it may be demonstrated by subsequent experiments, that the albuminoids of the beans and the sunflower-heads, being in a succulent condition, will be more easily and completely assimilable, than the seeds when ripe. The cost of 2½ acres of the "Robertson Silage Miixture" is only $15.00 more than for 2 acres of corn alone. This excess of cost is largely compensated by a production of albuminoids equivalent, as cattle-food, to that of 115 bushels of mixed grains; and in this calculation, no account is taken of the large quantity of fat in the sunflower heads.

DISCUSSION.

Mr. J. B. MacEwan (New Zealand)—I beg to thank Mr. Lowe for the very interesting lecture he has given us this evening. Being personally familiar with most of the conditions of which Mr. Lowe has been speaking, I am ready to endorse the greater part of the assertions he has made. For several years I was in intimate relations with dairying in Canada; for the last two years, I have been more particularly employed in the trade in dairy-products of New Zealand. I have studied the question in the States, in Canada, in New Zealand, and in Great Britain, and I flatter myself I am qualified to express an opinion on many of the points treated here this evening. There is one on which Mr. Lowe insisted very strongly, that of the reduction of the cost-price; all the countries, be they never so little interested in dairying, study this point, and very properly, too. Our best goods have reached a price on the English market that we can hardly expect to see increase; but we need not the less a margin of profit between their cost to us and the price we get for them. Mr. Lowe forgot one side of the question; a very important one, too, in my opinion. They who have made a study of dairying, and of the way in which it is carried on in different countries and in the Colonies, declare that these superb herds of cows, with marvellous records, are the creation of superior minds. Allow me to put the question to you as follows: In our conventions in America, we often have heard the representative of a well-known stock-farm in Wisconsin, in connection with the dairy trade; and he told us recently, that, if the cows could speak, they would go bellowing about all over the country, calling out "for an improved breed of farmers"! How are people to be induced to improve their cows, and to realise thus the fine natural profits that will enable them to practise the best methods of making their business pay. As to the Colonies, I am well convinced that, as regards the supplying of the markets and consulting the tastes of our English customers, we have in the peoples of Europe intelligent competitors, who will neglect nothing; and I am also assured that, in future, we must improve our dairy goods, as well those of Australia as of Canada. I am quite ready to admit that the English feel a certain tenderness for their dependencies; but who would dare to accuse them of sacrificing sentiment to the material questions of pounds, shillings and pence? And if any one of these competing countries can supply butter of better quality than can our Colonies, who shall contest the right of the

English to buy it? The capability of Australasia is very great, but after a stay of two years there, I feel that there is something to be done to rouse these people and to lead them to greater efforts to put in practice those improved methods that are now so well known. I know New Zealand better than the rest of the colonies, and can therefore speak with more authority about it. It is one of the finest countries I visited; the people are intelligent, but I am certain that dairying will make no great progress there, except by a fortunate combination of science and practice. We look forward to engrossing a large share of the English trade. I do not mean to say that we can, at present, contend with the peoples of Europe, but we can imitate them pretty closely. We can do almost as well as they; and we trust soon to be able to put the colonies of New Zealand and Australia on a good footing in comparison with the European countries, and, consequently, to be in a position to satisfy the taste of the English public. Before returning to New Zealand, I may tell you that I have derived fresh encouragement from this conference, and so I shall tell our people there. I shall tell them what they have to do, and how they ought to manage their dairy industry so as to make it successful.

Prof. F. J. Lloyd.—Not without hesitation do I address you; I only know our Colonies by what I have read in books, or heard in conversation with people who are acquainted with them. I speak as a man of science, and not as a practical man; but my impression is that there are two general principles, which are as true in the Colonies as in the mother country: that all progress in farming and in dairying will, in future, be the result of a combination of science and practice. Practice has had a full allowance of time to do all that it could do. Now, science is coming to the front, to assist practice, and by the combining of their united efforts, we may hope for a measure of success hitherto unknown.

As regards the Colonies, as far as I can judge, it would not suffice for them to put in practice the information obtainable in the mother-country or in other places abroad.

I believe it to be essential that each Colony possess an experiment station, with men at its head who are competent to resolve the problems which are peculiar to those countries.

Each Colony will meet with peculiar difficulties; some there may be common to several, but they will only be the more easily solved, if several persons work at their solution separately and independently of the rest. For instance, butter is one of the principal products in which we are interested. It is made in the Colonies, if I understood the lecturer right, from pasteurised milk; we saw how the process destroyed certain bacteria, but not all sorts. You all know what is meant by *rancid* butter. Science teaches that rancidity in butter is due to the development of certain micro-organisms, called bacteria, and that these are produced from spores Pasteurising milk does not destroy these spores, and one of the greatest difficulties we, in the Colonies, have to struggle with is the following: it will be all very fine for them to pasteurise their milk or cream, but in spite of that the butter will always contain these organisms, so the question remains to be solved: how is butter to be kept, not only in the

Colonies, but during its transit to England, and last of all, in that country itself, so as to preserve all the fine aroma it may possess, and not become stale, as I am told a large proportion of butters do if they heat a little? There are also difficulties present in cheese making, which up to a certain point, are still more perplexing than those relating to butter. According to my own experience, which is already pretty extensive, I do not think milk can be pasteurised if it is to be used for cheese making, but I am positive that, unless the greatest possible attention be paid to get the farmers to deliver their milk perfectly free from all contamination, no country in the world will ever succeed in making cheese of the finest quality. I find, in England, that the greatest difficulty with which the factories have to contend is the obtaining of milk exempt from filth and contamination. No one can judge of milk at the moment it reaches the factory, and consequently it is impossible to pay the farmer who brings pure milk, the farmer who delivers clean milk, the price proportionate to the real value of their milk, but all this good milk will not the less be ruined by the introduction into the common vat of a small quantity of bad milk. That is the great trouble of cheese making in factories. Unfortunately it is to be feared that the custom of pasteurising the milk for butter making will make farmers less careful in the keeping of their milk, under the pretext that this operation will destroy all the little impurities. Thus you will have two interests in opposition one to the other, and if you mean to succeed you will have to begin at the beginning, that is, to see that all the milk delivered at the factory is perfectly clean and sound. We hear it said every day that our English cheese is not so good as it used to be, and I have often been asked: "How do you account for that?" I think I can account for it. Of late a system has been adopted of disposing of the water from our drains, that has befouled all the streams of the country. I have distinctly followed the traces of the filth of the drains from the brook to the cow and from the cow to the milk. Let our colonists profit by the lesson and look to it that their streams be not sullied by drainage-waters as those of the mother country have been. One more word on cheese. Although it is quite true, as Mr. Lowe observed, that the English government has set up no experiment station, I think it is only fair to say that the researches I have been enabled to make on cheese making have been facilitated by grants made by the Chamber of Agriculture and the Bath and West of England Agricultural Society. Without these grants I should have been unable to make these experiments (the result of which has been published for the benefit of the world at large); so that our Government does do something and would doubtless do more, if it were sure that the results would pay for the outlay. Judging, I suppose, from my own work, it does not seem to be thoroughly satisfied on this point. I found that there are two conditions necessary for the making of the finest cheese. The former is decidedly the purity of the milk, and the presence of the necessary bacteria; the second, and this is just as important, is the efficient control of the acidity developed in each and every phase of the process. Here, is an instance: Some years ago, having recognised the necessity of the acidity, and seeing that if it were necessary it must be susceptible of being calculated by an intelligent maker, I made, or rather described, an apparatus I had used in my work. This apparatus was then manufactured and put on the market by the makers of such things, and now the cheese makers are beginning

to use it. A large dealer in cheese came to see me in London the other day, and asked me all about a certain apparatus he had seen in the West of England. The previous year, he had bought from a certain factory some cheese, the quality, of which was very irregular, and for which he paid only a moderate price. This year the cheese from the same factory was marvellously regular in quality and the buyer paid the highest market price for the whole of it. Asked if he could explain this improvement, the cheese maker replied: "Easily enough; I managed my process daily by estimating the acidity at different phases of the operation, and I believe that the uniformity of the cheese is solely due to that." I am certain that if our Colonies mean seriously to have cheese of the finest quality their makers must devote more attention to the question of acidity.

But do not imagine that everything I may have written about making cheese in England must prove exactly the teaching suited to the making of cheese in Australia, for instance; for the temperature, the weather, the conditions of transit to the English market this cheese will have to suffer: all these must be reckoned with. Were it only to solve this problem alone, the Colonies ought to appoint their own experts, and establish experiment-stations in which these questions may be studied.

Lastly, I think we, in England, ought to do something to prevent genuine articles from being driven out of the markets by adulterated rubbish. It is high time that government should pass a law to amend "The Act regulating the sale of food and drugs." Everywhere, there is a pressure being brought to bear upon the government to bring on this measure, a pressure I entreat all those who are present to join in enforcing, so that those who, in our Colonies, are producing butter and cheese, which I have every reason to believe are pure and unadulterated, may not have to struggle with unscrupulous rogues who are striving to bring about the ruin of the market both for the English as well as for the Colonial producer.

Other speakers continued this discussion, in which equally shared representatives of New Zealand, New South Wales, &c.; but, unfortunately, no one from Canada addressed the convention. However, at the wind-up of the session, Mr. Lowe mentioned that Mr. D. M. Macpherson (one of the speakers at the Valleyfield meeting) kept, on a farm of 100 acres, 60 cows, that returned him a yearly net profit of $1,100.

RECE

(*Balanced up*

ASSOCIATION :

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Governmen

SYNDICATES :

Government

DAIRY-SCHOOL :

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Sales of chee
Various.....

ASSOCIATION :

Expenses of t
Salaries of th

SYNDICATES :

Salaries, trave

DAIRY-SCHOOL :

Découvert 189
Expenditure

Working expe

REPORT OF THE AUDITOR.

RECEIPTS AND EXPENDITURE OF THE ASSOCIATION.

(Balanced up to June. 1898, to make the starting point of its accounts agree with the beginning of the provincial fiscal year.)

RECEIPTS.

Association :		
Balance 1897	$ 331.95	
Government grants (special)	956.44	
		$1,288.39
Syndicates :		
Government grants		1,320.93
Dairy-school :		
Dominion grants	3,000.00	
Provincial grants	3,146.83	
Sales of butter	3,589.76	
Sales of cheese	711.31	
Various	74.25	
		10,522.18
Total receipts		**$ 13,131.50**

EXPENDITURE.

Association :			
Expenses of the convention		$ 408.11	
Salaries of the Secretary and his assistant		548.33	
			956.44
Syndicates :			
Salaries, travelling expenses, etc			1,320.93
Dairy-school :			
Découvert 1897	$ 366.57		
Expenditure charged to capital	308.70		
		675.27	
Working expenditure winter of 1897-98		10,517.57	
			11,192.84
Total expenditure			**$13,470.21**

RECAPITULATION.

	ASSOCIATION.	SYNDICATES.	SCHOOL.
Receipts	1,288.39	1,320.93	10,522.18
Expenditure	956.44	1,320.94	11,192.84
Surplus	331.95	Découvert	670.66
			331.95
		Difference	338.71
Balance due to the Secretary			34.62
Total découvert			373.33

Examined and found correct.

(*Signed*) SAUL TALBOT,

Auditor.

St. Hyacinthe, Feb. 6th, 1899.

RECEIPTS AND EXPENDITURE OF THE ASSOCIATION.

(From July 1st to December 1st, 1898.)

		Cr.		Dr.
Association :			**Balance 1st July, 1898**	
Stationery, postage, etc..	$297.65		($331.95—$34.62).....	$297.33
Printing paid			Sales, reports, and div....	50.89
In cash..... $294.86			Subscriptions '97. $ 25.00	
In grants.... 468.11			" '98. 973.00	
	762.97			998.00
Travelling expenses of Directors.....	35.16		" life.....	40.00
Expenses of the convention.....	200.59		Note discounted..	300.00
Books and papers.....	68.54		Grant (on account).....	781.43
Salaries paid by grants..	313.32			$2,467.65
Extra expenditure.....	53.80			
		$1,732.03		
Balance in hand....	**$735.62**			
Syndicates :				
E. Bourbeau's travelling expenses			Boxes of tests.....	25.00
Cash..... $ 17.41			Grant from Quebec (on account).....	1,563.06
Grants..... 344.84				1,588.06
	362.25		Excess of expenditure..	**$12.41**
E. Bourbeau's salaries,				
Cash..... 20.00				
Grants..... 400.00				
	420.00			
J. A. Plamondon travelling expenses.....	317.57			
do Salaries.....	280.00			
Printing	100.65			
Test-boxes	120.00			
		1,600.47		
Dairy-School :				
Découvert July 1st, '98 .	670.66		Federal grant for refrigerators.....	50.00
Current expenditures			Balance for working expenses, summer of 1898.	98.29
Grant..... 101.00			Grant from Quebec (on account)	299.02
Salaries grant 100.00				447.31
Office expenses 98.02			Excess of expenditure..	**$522.37**
	299.02			
		969.68		
General balance.....		200.84		
		$4,503.02		**$4,503.02**

Examined and found correct.

(*Signed*) SAUL TALBOT,
Auditor.

St. Hyacinthe, February 6th, 1897.

SYNOPTIC TABLE OF THE

NOS Of the Syndicate.	NOS Of the Division.	NAMES OF INSPECTORS.	NUMBER OF Factories.	Days of inspection.	Short visits.	TESTS OF MILK. Lactodensimeter.	TESTS OF MILK. By the Babcock.	Letters written.	Fines.	Patrons.	Cows.	Number in ranks.
1	3	Painchaud, J. L.	23	.....	.....	.....	.....	.....	.....	.....	.....	1
2	3	Collette, Don	24	.....	.....	.....	.....	.....	.....	.....	.....	2
1	4	Roger, Francis	23	119	39	2819	1632	7	5	842	.....	3
2	4	St-Pierre, G.	28	.....	.....	.....	.....	.....	.....	.....	.....	4
3	4	Davignon, D. S.	23	117	97	2459	1872	4	3	599	3984	5
1	5	Pothier, B. A.	15	.....	.....	.....	.....	.....	.....	.....	.....	6
2	5	Parent, Wm.	29	117	216	3611	653	.....	.....	1026	7134	7
2	6	Palmer, H. W.	19	170	52	451	3917	.....	1	466	3560	8
1	8	Bennett, Chas.	25	.....	.....	.....	.....	.....	.....	.....	.....	9
2	8	Robillard, Francois	22	118	72	4662	611	16	5	851	5234	10
1	9	Aubin, Sam.	23	.....	.....	.....	.....	.....	.....	.....	.....	11
2	9	Boivin, Elie	19	.....	.....	.....	.....	.....	.....	.....	.....	12
1	10	Robert, Max.	21	170	51	3367	5193	40	2	1022	7580	13
2	10	Ferguson, Geo.	25	.....	.....	.....	.....	.....	.....	.....	.....	14
3	10	Wherry, Rob.	25	112	102	1985	2019	63	18	547	7241	15
4	10	Macfarlane, Arth.	21	.....	.....	.....	.....	.....	.....	.....	.....	16
5	10	Wilkins, Chas.	15	.....	.....	.....	.....	.....	.....	.....	.....	17
1	12	Lloyd, A. S.	22	151	60	5390	5609	9	6	915	.....	18
2	12	Lacoste, Delph.	17	.....	.....	.....	.....	.....	.....	.....	.....	19
3	12	Marleau, A. E.	15	.....	.....	.....	.....	.....	.....	.....	.....	20
1	13	Smith, Arch.	15	160	200	1185	5510	21	.....	724	5954	21
1	14	Tremblay, P.	16	.....	.....	.....	.....	.....	.....	.....	.....	22
2	14	Gaudreault, Pit.	15	90	67	89	77	10	1	323	2752	23
3	14	Hudon, J. El.	22	.....	.....	.....	.....	.....	.....	.....	.....	24
4	14	Gagnon, Alf.	17	.....	.....	.....	.....	.....	.....	.....	.....	25
1	15	Guertin, Alf.	16	124	30	2703	640	31	3	423	1715	26
1	15-16	Trudel, F. X. O.	26	.....	.....	.....	.....	.....	.....	.....	.....	27
2	16	Lacourcière, L. P.	25	.....	.....	.....	.....	.....	.....	.....	.....	28
1	17	Parent, D. J.	21	116	66	4080	1008	26	2	891	.....	29
2	17	Danis, J. O.	17	99	112	2606	105	19	4	577	.....	30
1	17-18	Corbeil, Theod.	20	.....	.....	.....	.....	.....	.....	.....	.....	31
1	19	Ross, J. W.	21	150	400	1059	1453	18	1	546	5401	32
1	20	Desrochers, Gab.	22	129	70	6154	989	112	30	1265	.....	33

REPORTS OF THE INSPECTORS.

Number in ranks.	Number of factories that have sent reports.	TOTAL. Milk received	Butter or cheese made.	Cash. *	Price of making per lb.	AVERAGE. Milk per cows.	Butter and Cheese per 100 lbs.	Lbs. of milk to lb. of B. or C.	CASH PER * Patron.	Cow.	100 lbs. milk.	Price of F. or B.
1												
2												
3	3	1,756,303		13,787 20		1878			77 90	14 75	.78	
4												
5	15	5,685,400	553,040	41,313 14		2255	9 72	10 28	110 17	16 17	.72	7½
6												
7	29	17,059,723	1,745,336	134,811 98		2391	10 23	9 77	131 39	18 89	.78	7¾
8	16	8,416,045	840,623	57,464 58		2943	9 98	10 01	155 30	20 09	.68	6.8
	1	1,794,250	78,012	15,602 40		5980	4 35	23 00	371 50	52 00	.86	20.0
9												
10												
11												
12												
13												
14												
15	25	14,814,474	1,279,545	98,896 74		1907	9 26	10 78	180 80	13 66	.72	7⅞
16												
17												
18												
19												
20												
21	8	6,078,189	573,927	36,652 56		2749	9 44	10 58	160 05	16 58	.74	7⅞
	7	14,404,126	608,744	87,508 60		3848	4 22	23 60	213 27	28 25	.72	17⅞
22												
23												
24												
25												
26												
27												
28												
29												
30												
31	21	12,809,353	1,218,633	97,610 38		2372	9 51	10 50	178 80	18 03	.76	8.
32												
33	8	4,139,457	393,030	29,832 93			9 49	10 53	93 52		.72	7⅞
	14	13,101,647	573,491	98,991 78			4 37	22 80	104 64		.75	17.2

* The total and average receipts in this table are the *gross*, i. e., the cost of making is to be deducted. This varies from, for butter, 3 to 3½ cts a pound ; for cheese, a cent to 1½ ct.

OF TH

ALPHABETICAL TABLE

OF THE LECTURERS, REPORTERS, AND PERSONS THAT TOOK PART IN THE DISCUSSIONS.

ANALYTICAL TABLE OF CONTENTS.

TABLE OF CONTENTS.