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SEVENTH
ANNUAL REPORT
OF THE
DAIRYMEN'S ASSOCIATION
OF ONTARIO,
WITH
TRANSACTIONS & ADDRESSES OF THE ANNUAL CONVENTION,
LIST OF MEMBERS, REPORTS OF FACTORIES,
AND OTHER
INTERESTING INFORMATION,
FOR THE YEAR 1874.

Published by the Association.

INGERSOLL:

PRINTED AT THE OFFICE OF THE "OXFORD TRIBUNE," THAMES STREET.

1874.

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PREFACE.

IN presenting this, our Seventh Annual Report, we have to say that we feel proud on account of the encouragement we have received in its preparation, and we feel sure that the Act of Parliament which incorporated the Dairymen's Association of Ontario, will serve most excellently the purpose for which it was intended, namely, to encourage and promote this most important branch of our farming industry. We are confident that it must have been extremely gratifying to every one who attended our last Annual Convention to see the deep interest that was manifested by dairymen from all sections of the Province, and the friendly reciprocity existing between them. The great success which attended that meeting, we hesitate not to say, may chiefly be attributed to the zeal and energy that was displayed by the Local Committee in making the requisite arrangements, and the hearty and mutual co-operation of Canadian Dairymen generally.

To say that the Dairying interests throughout the whole of Ontario are rapidly increasing, would only be to assert that which must appear patent to the most casual observer. Our exports during the past season have vastly exceeded those of any former year, and the probabilities are that the next season will be marked by a large increase over all the past, in the manufacture and exportation of this staple commodity. Upon facts like these

we cannot but draw our own conclusions, and these must tell us that there can be but one reason why so much of our cheese finds its way into foreign markets, and that is, it must at least reach the average quality of American manufactures. If our cheese were not equal to those of our American neighbors, they would be thrown back on our own hands, and thus the whole trade would be stigmatized in the beginning, and the farmer would be compelled to go back to his plough, and by the constant use of artificial fertilizers, seek to gain a livelihood from the soil already well nigh spent by repeated cropping, whereas now he is able to reap greater profits with less labor from the products of the dairy while his farm is recovering its wasted powers.

This state of facts cannot but be pleasing to the members of our Association, because we believe that the great success of this branch of husbandry is in a very great measure owing to the knowledge that has been dispensed at the annual gatherings held in connection with our Association.

This report, we fancy, will be found replete with much valuable information to Dairymen, and to the farming community in general. The addresses herein contained, delivered by practical men of science and experience, cannot but be of deep interest to those more particularly engaged in the manufacture of dairy products, and we would recommend them for your careful perusal. The discussions on various topics relating to the manufacture of cheese, taken part in by men of the most practical experience, moreover, cannot fail to arrest the attention of those on whom the duty and responsibility rests of sustaining the reputation of Canadian cheese.

We have also endeavored to obtain, as far as possible, the

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statistics of the various factories throughout Ontario, so that dairymen can become conversant with the success and prosperity of other factories. In this, however, we have to deplore the fact that we are unable to present more extensive reports. But this fault does not rest with us, from the fact that a great many of our communications regarding factory statistics have remained unanswered.

This report, we are happy to state, will appear before the public much earlier than our last, as we hope to be able to place it in the hands of our members before the season for cheese-making shall have commenced, and on its perusal we trust you will find its matter and arrangement meeting your approbation, and that its study may assist you in further improving the quality and manufacture of Canadian exports in this growing branch of agriculture.

With this desire it is respectfully submitted.

Yours, &c.,

J. CARRUTHERS HEGLER,

SECRETARY.

INGERSOLL, March 4, 1874.

AN ACT

TO

Protect Butter and Cheese Manufacturers.

ASSENTED TO MARCH 4th, 1868.

WHEREAS, it is expedient and necessary to Encourage and Protect Butter and Cheese Manufacturers in this Province: Therefore, Her Majesty, by and with the advice and consent of the Legislative Assembly of Ontario, enacts as follows:—

1. Whosoever shall knowingly and fraudulently sell, supply, bring or send to be manufactured to any cheese or butter manufactory in this Province, any 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;" or whoever shall keep back any part of the milk known as "strippings;" or whoever shall knowingly and fraudulently sell, send, bring or supply milk to any cheese or butter manufactory that is tainted, or partly sour from want of proper care in keeping pails, strainers, or any vessel in which said milk is kept, clean and sweet, after being notified of such taint or carelessness, either verbally or in writing; or any butter or cheese manufacturer who shall knowingly and fraudulently use, or direct any of his or her employees to use for his, her, or their individual benefit, any cream from the milk brought to any cheese or butter manufactory without the consent of all the owners thereof, shall, for each and every offence, forfeit and pay a sum not less than one dollar, nor more than fifty dollars, in the discretion of the presiding Justices before whom the case shall be heard.

2. Any two or more Justices of the Peace, having jurisdiction within the locality where the offence has been committed, may hear and determine such complaint upon the oath of one or more credible witnesses, and shall have power, in case the penalty awarded by them be not forthwith paid, upon conviction, to levy the same by distress and sale of the goods and chattels of the offender by warrant under their hands and seals, or the hands and seals of any two of them; and the penalty, when recovered, shall be paid over by such Justices, one-half to the person complaining and one half to the treasurer of the municipality, district, or place where the offence shall have been committed; and, in default of payment or sufficient distress, the offender may, by warrant signed and sealed as aforesaid, be imprisoned in the common gaol for a period not less than one day, nor more than twenty days, at the discretion of such Justices, or any two of them, unless such penalty, costs, and the charges of commitment, be sooner paid.

3. Any party aggrieved by such fraudulent conduct as aforesaid, may, at his or their election, sue the offender in any civil court of competent jurisdiction, and recover from him the amount of damages sustained, and levy the same, with the costs, according to the ordinary practice of the court in which such suit shall be brought.

4. Provided always, that no Justice or Justices having any pecuniary interest in any such butter or cheese manufactory, as aforesaid, shall hear or determine any such complaint.

5. In case of summary proceedings under this Act, any person, complainant or defendant, shall have the right of appeal as provided in Chapter one hundred and fourteen of the Consolidated Statutes of Upper Canada.

AN ACT
TO
Amend the Agricultural and Arts Act.

THE DAIRYMENS ASSOCIATION.

33a. The societies now existing and known respectively as "The Canadian Dairymen's Association" and the "Ontario Dairymen's Association," may organize and form themselves into a society, comprising not less than eighty members, each paying an annual subscription of not less than one dollar, to be known as the "The Dairymen's Association of Ontario," by signing the declaration and taking the proceedings (so far as applicable) prescribed in sections twenty-six, twenty-seven and twenty-eight of this Act, in relation to horticultural societies; and upon notice thereof being inserted in the *Ontario Gazette*, such society shall become a body corporate, and may make by-laws, rules and regulations not being contrary to this Act or the general law of the Province, for its guidance and management.

1. Such association shall be entitled to receive from unappropriated moneys in the hands of the treasurer of this Province, a sum not to exceed seven hundred dollars in any one year, on the like conditions (so far as applicable) provided in section forty-six, in the case of county or electoral division societies.

2. Such Association shall hold a meeting on the second Wednesday in February in each year, either at Ingersoll or Belleville; the first of such annual meetings to be held at Belleville on the second Wednesday in February, in the year of our Lord one thousand eight hundred and seventy-four, and the two meetings following at Ingersoll, and shall continue to hold such

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annual meetings in like manner, once at Belleville and twice at Ingersoll; and shall, at each such meeting, present a full report of its proceedings, and a detailed statement of its receipts and expenditure for the previous year; and elect a President, Vice-President, Secretary, and Treasurer (or a Secretary-Treasurer), and not fewer than five, nor more than nine, Directors, and shall elect two Auditors; the officers of the said association, until the elections at the annual meeting to be held in February, in the year one thousand eight hundred and seventy-four, to be as follows:—Thomas Ballantyne, President; Ketchum Graham, Vice-President; J. Carruthers Hegler, Secretary; Charles E. Chadwick, Treasurer; Edwin Casswell, James Noxon, Peter J. Brown, James M. Wilson, Peter Daly, William Yates, Henry Ostrom, Benjamin Hopkins, and George Morton, Directors; and Charles H. Sorley and Thomas Welis, Auditors.

3. The said association shall also hold annually a cheese fair or exhibition, in connection with the annual agricultural shows held at Ingersoll and Belleville, respectively; such cheese fair or exhibition to be held in the same way as the annual meetings of the said association are held—that is to say, once at Belleville and twice at Ingersoll; and at each such fair or exhibition a sum amounting to not less than one-half of the annual grant mentioned in sub-section one of this section, shall be given as prizes for cheese.

4. A copy of said report and statement of receipts and expenditure, and a list of the office-bearers elected, and also such information on the subject of dairies and dairy products in this Province and elsewhere, as the association may have been able to obtain, shall be sent to the Commissioner of Agriculture within thirty days after the holding of such annual meeting.

8. Section fifty-one of the said Act is hereby amended by inserting in line four after the word "sell," the word "mortgage;" and sub-section one of the said section, as amended by the nineteenth section of the Act passed in the thirty-fourth year of the reign of Her Majesty, chaptered nineteen, is amended by inserting in the fifth line of said sub-section, after the word "sell," the word "mortgage;" the power to mortgage by the foregoing part of this section enacted shall extend to electoral division agricultural societies as to all property held by such societies respectively.

9. In Schedule B, lines two and three, strike out the words "the Act respecting the Bureau of Agriculture and Agricultural Societies, and insert "The Agricultural and Arts Act" in lieu thereof.

10. In Schedule D, line four, strike out the word "special;" in line five, after the word "of," insert "a reading room;" and in line six strike out the word "both" and insert "all" in lieu thereof.

11. This Act shall be read as a part of the Act hereby amended.

ARTICLE I.—The name of the organization shall be "The Canadian Planting Association."

ARTICLE II.—The officers of the Association shall consist of a President, Vice-President, Secretary, and Treasurer.

ARTICLE III.—The President, Vice-President, Secretary, and Treasurer shall be elected at each annual meeting of the Association.

ARTICLE IV.—The officers of the Association shall be elected at each regular annual meeting, and shall remain in office until the successors are chosen.

ARTICLE V.—The regular annual meeting shall be held on the first Wednesday in February in each year, at the Town of Ingersoll, Ontario.

ARTICLE VI.—The regular annual meeting shall be held on the first Wednesday in February in each year, at the Town of Ingersoll, Ontario.

ARTICLE VII.—The regular annual meeting shall be held on the first Wednesday in February in each year, at the Town of Ingersoll, Ontario.

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ARTICLES OF ASSOCIATION.

WHEREAS, it is deemed expedient to form a Canadian Dairymen's Association, through which, as a medium, results of the practical experience of dairymen may be gathered and disseminated among the dairying community; therefore be it:

Resolved,—That we, the undersigned, do hereby associate ourselves together for mutual improvement in the science of cheese-making, and more efficient action in promoting the general interests of the dairy community.

ARTICLE I.—The name of the organization shall be "The Canadian Dairymen's Association."

ARTICLE II.—The officers of the Association shall consist of President, Vice-Presidents, Secretary, and Treasurer.

ARTICLE III.—The President, Vice-Presidents, Secretary, and seven other members appointed at each annual meeting, shall constitute the Executive Board of the Association.

ARTICLE IV.—The officers of the Association shall be elected at each regular annual meeting, and shall retain their offices until their successors are chosen.

ARTICLE V.—The regular annual meeting shall be held on the first Wednesday in February in each year, at the Town of Ingersoll, Ontario.

Officers of the Association for 1874.

PRESIDENT.

K. GRAHAM, Esq., Belleville.

VICE-PRESIDENT.

A. OLIVER, Esq., M. P. P., Ingersoll.

SECRETARY.

J. C. HEGLER, Esq., Ingersoll.

TREASURER.

P. R. DALY, Esq., Belleville.

DIRECTORS.

THOS. BALLANTYNE, Sebringville.	W. S. YATES, Belleville.
LEWIS RICHARDSON, Kerwood.	ALLAN McLEAN, Ingersoll.
HENRY OSTROM, Moira.	D. VANDEWATER, Belleville.
GEORGE MORTON, Morton.	THOS. BROWN, Ingersoll.
T. D. MILLAR, Ingersoll.	

AUDITORS.

THOS. WELLS, Ingersoll.	C. H. SORLEY, Ingersoll.
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Dain

Ashley
Abraham
Artrell
Anders
Anders
Adams
Anders
Alguire
Abraham
Arnold
Bartlett
Bowling
Bedell
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Bagely
Brinton
Benson
Bensley
Batman
Bird,
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1874.

LIST OF MEMBERS

OF THE

Dairymen's Association of Ontario,

FOR THE YEAR 1874.

Belleville.
N, Ingersoll.
R, Belleville.
Ingersoll.

Ingersoll.

<i>Name.</i>	<i>Residence.</i>	<i>Name.</i>	<i>Residence.</i>
Ashley, Harford...	Foxboro.	Byers, W. H.....	Hawkesbury.
Abraham, J. C. ...	Newark.	Boardman, M.....	Hulloway.
Artrells, E.	Belleville.	Brintnel, A. H....	Colborne.
Anderson, Levi....	Rednersville.	Bells, J. A.....	Milford.
Anderson, Jas.....	Do.	Boardman, G. C....	Belleville.
Adams, John.....	Ingersoll.	Barney, Robt.....	Bridgewater.
Anderson Geo.....	Belleville.	Burrell, D. H....	Little Falls, N.Y
Alguire, C. J.....	Farmersville	Bird, Manley.....	Foxboro.
Abraham, John....	Springford.	Brown, James.....	Belleville.
Arnold, L. B....	Rochester, U.S.	Bowstead, J. H....	Do.
Bartlett Thos.....	Belleville.	Bruntnell, G. P....	Cannifton.
Bow, John.....	Do.	Brenton, J. W....	Do.
Bedell Daniel R....	Brighton.	Brenton, F.....	Do.
Bradshaw, G.....	Campton.	Brodre, Hugh.....	Belleville.
Brown, Hiram.....	Whitby.	Bird, James.....	Hulloway.
Bradshaw, W. R....	Cannifton.	Bird, John G.....	Huntingdon.
Bowerman, V.....	Canbray.	Borridale, G.....	Belleville.
Bagely, Robt.....	Belleville.	Bell, Prof. J. T....	Do.
Brintnell, J.....	Plainfield.	Ballantyne, Thos..	Sebringville.
Benson, Josiah....	Picton.	Conley, Geo.....	Sterling.
Bensley, Wm.....	Cannifton.	Chown, R. & Co....	Belleville.
Batman, John B....	Madoc.	Conger Bros.....	Do.
Bird, Jno. F.....	Cooper Topp.	Collett, Martin....	Cobourg.
Bowell, M.....	Belleville.	Caton, N. A.....	Nappinee.
Bonestead, N. A...	Frankford.	Connor, C. N.....	Picton.

<i>Names.</i>	<i>Residence.</i>	<i>Names.</i>	<i>Residence.</i>
Caldwell, John.....	Auburn.	Falkner, J.....	Foxboro.
Cadman, Richard.....	Salford.	Fitzpatrick, T.....	Halloway.
Chisholm, Charles.....	Frankford.	Greer, A. L.....	Belleville.
Coleman, Dr.....	Belleville.	Gay, Jas.....	Foxboro.
Clear, James.....	Bogart.	Gross, Chas.....	Kingston.
Clark, William.....	Salford.	Greenaway, T. R.....	Oakwood.
Cunningham, J. M.....	Picton.	Grow, W. F.....	Picton.
Cunningham, H.....	Rednersville.	Garbutt, Robt.....	Belleville.
Charlton, Mrs. B. G.....	Hamilton.	Gillard, W.....	Springford.
Charlton, Mr. B. G.....	do	Gerow, Wilbert.....	Picton.
Casswell, E.....	Ingersoll.	Gilbert, H. S.....	Belleville.
Clute, R. C.....	Belleville.	Goldsmith, E. N.....	do
Clapp, Benj.....	Cannifton.	Griffin, M.....	do
Chisholm, Jas. A.....	Walbridge.	Golden, Chas.....	Frankford.
Campions, Wm.....	Belleville.	Gazard, E. B.....	Picton.
Caldwell, David.....	Halloway.	Gordon, Robt.....	Belleville.
Cornell, Geo. H.....	Washington.	Graham, K.....	Belleville.
Clyne, John.....	Stratford.	Hutchison, Jos.....	Stratford.
Chadwick, C. E.....	Ingersoll.	Henman, S.....	Dundonald.
Davison, L. H.....	Napanee.	Hawley, L.....	Belleville.
Davidson, J. G.....	Melrose.	Huyck, A.....	Bloomfield.
Dezell, Samuel.....	Peterboro.	Harris, W. N.....	Napanee.
Drewry, George.....	Sterling.	Haggerty, Jas.....	Huntingdon.
Donald, Douglas.....	Warkworth.	Harvey, John.....	Trenton.
Drewry, Wm.....	Sterling.	Hately, J. C.....	Brantford.
Donald, John D.....	Speedie.	Hazard, Wm. E.....	Picton.
Denman, J. E.....	Picton.	Hampton, T. K.....	Belleville.
Daly, W. R.....	Foxboro.	How, Daniel.....	Mellville.
Daly, P. R.....	Halloway.	Harris, J. B.....	Antwerp.
Dingswall, G.....	Belleville.	Holton, Geo. C.....	Belleville.
Dempsey, Jno.....	Fairview.	Hamilton, A.....	do
Egleton, Lewis.....	Foxboro.	Horton, E. E.....	Toronto.
Ellis, A.....	Culloden.	Hegler, J. C.....	Ingersoll.
Foster, Byron.....	Foxboro.	Huffman, D. G.....	Frankford.
Fuller, Wareham.....	Madoc.	Hambly, P. H.....	Belleville.
Forer, John.....	Belleville.	Harris, C. A.....	Brighton.
Fralick, B.....	do	Hayne, Emanuel.....	Belleville.
Fargey, P.....	Huntingdon.	Holgate, Thos.....	Foxboro.
Finn, W.....	Foxboro.	Huyck, G. J.....	Picton.
Frederick, P.....	Belleville.	Hatfield, T. A.....	Wolf Island.
Fuller, D. G.....	Cannifton.	Hume, Thos.....	Burnbrae.
Foster, Daniel.....	Cannifton.	Haggard, T. B.....	Melleville.
Fenn, John.....	Belleville.	Harris, T. B.....	Hamilton.

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Knigh
Ketch
Lewis
Leech
Legge
Leech
Lyons
Lawso
Lane,
Lucas
Macki
Miller
Marsh
Mond
Meagl
Mallo
Miller
Murre
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Moore
Massy
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LIST OF MEMBERS.

17

Residence.
 ...Foxboro.
 ...Halloway.
 ...Belleville.
 ...Foxboro.
 ...Kingston.
 R. Oakwood.
 ...Picton.
 ...Belleville.
 ...Springford.
 ...Picton.
 ...Belleville.
 ...do
 ...do
 ...Frankford.
 ...Picton.
 ...Belleville.
 ...Belleville.
 ...Stratford.
 ...Dundonald.
 ...Belleville.
 ...Bloomfield.
 ...Napanee.
 ...Huntingdon.
 ...Trenton.
 ...Brantford.
 ...Picton.
 ...Belleville.
 ...Mellville.
 ...Antwerp.
 ...Belleville.
 ...do
 ...Toronto.
 ...Ingersoll.
 ...Frankford.
 ...Belleville.
 ...Brighton.
 ...Belleville.
 ...Foxboro.
 ...Picton.
 ...Wolf Island.
 ...Burnbrae.
 ...Mellville.
 ...Hamilton.

<i>Names.</i>	<i>Residence.</i>	<i>Name.</i>	<i>Residence.</i>
Haggard, Geo.....	Belleville.	Morton, A.....	Belleville.
Hampton, Thos....	do	Mordon, J. B.....	Rednersville.
Hamilton, Wm....	Moir.	Mordon, Samuel....	do
Haglett, Joseph....	Thurlow.	Mallock, J.....	Belleville.
Holden, J. C. & Co.	Belleville.	Mitchell, F.....	Foxboro.
Holbrock, J.....	do	Millar, T. D.....	Ingersoll.
Hamilton, D. P....	do	Morton, Geo.....	Morton.
Hamilton, J. S....	do	McFee, Angus....	Belleville.
Harrison, J. E.....	Bridgewater.	McKee, W. Y.....	do
Johnson, Robt....	Camden East	McMullen, Jno....	do
Johnson, John....	Belleville.	McGilvory, Jno....	Ingersoll.
Jrome, T. S.....	Stockdale.	McDonald, J. W....	Belleville.
Jarvis, Jas.....	Embro.	MacPherson, D....	River Raisin.
Kyle, S.....	Belleville.	McLean, Allan....	Ingersoll.
Ketchpaw, Wm....	Cannifton.	McKinn, J. N.....	Newburg.
Kelso, F.....	Belleville.	McDecook, Wm....	Cannifton.
Klotz, Otto.....	Preston.	McIntosh, Jas....	Belleville.
Ketcheson, Wm....	Cannifton.	McAulay, D.....	Foxboro.
Ketcheson, A. F....	Walbridge.	Norsworthy, J. C..	Ingersoll.
Ketcheson, F. C....	do	Noxon, Jas.....	do
Knight, S. P.....	Belleville.	Nightingale, T....	Belleville.
Ketcheson, O. R....	Moir.	Nimmo, James....	Camden East
Lewis, J. & Co....	Belleville.	Noxon, Richard....	Hillier.
Leech, E.....	Gorrie.	Norton, R.....	Thomasburg.
Legge, J., Jr.....	Ganannoque.	Nightingale, J....	Belleville.
Leech, Jno.....	Lansdown.	Ostrom, C. R.....	do
Lyons, L.....	Wellington.	O'Brien, Peter....	do
Lawson, Joseph....	Farmersville.	Ostrom, Henry....	Moir.
Lane, B. W.....	Walbridge.	Oliver, A., M.P.P..	Ingersoll.
Lucas, D. L.....	do	Parish, W. G.....	Farmersville.
Mackie, E.....	Belleville.	Parish, Benj.....	Belleville.
Miller, T.....	Bloomfield.	Potter, W. A....	Mountainview.
Marsh, W. H.....	Belleville.	Potter, John.....	Spring.
Mondson, L.....	do	Phillips, Jas.....	Cromlin.
Meagher, Jas.....	do	Parry, W. R.....	Belleville.
Malloy, Bradley....	Frankford.	Palmer, A.....	Cannifton.
Miller, Wm.....	Chapman.	Partison, M. G....	Foxboro.
Murray, Wm.....	Huntingdon.	Peckhan, B.....	Belleville.
Mundy Geo.....	Beachville.	Phillips, N. W....	do
Maddin, Robt.....	Newburgh.	Robinson, J. B....	do
Moore, S. A.....	Belleville.	Robinson, A. S....	do
Massy, W. J.....	do	Robertson & McLean	do
Mason, J. G.....	Hamilton.	Read Robt.....	do

<i>Names.</i>	<i>Residence.</i>	<i>Name.</i>	<i>Residence.</i>
Rodgers, J. C.....	Oakwood.	Taylor, J.....	do
Read, O. P.....	Rome, N. Y.	Tucker, Henry....	Walbridge.
Roblin, Ira.....	Chapman.	Townsend, Wm....	Halloway.
Roblin, John.....	Rednersville.	Tucker, Wm.....	Ingersoll.
Roblin Geo.....	do	Thompson, Wm....	Arkona.
Robertson, J. L....	Stabane.	Vanderwort, D....	Herald.
Richardson, Jno....	St. George.	Vanderwort, W. F.	Sidney.
Ross, A. B.....	Madoc.	Vanderwort, W. R.	do
Rullan, W. H.....	Melville.	Vanderwort, J. A.	Wellman.
Richie, Alex.....	Inverary.	Vandewater, D....	Belleville.
Roblin, Daniel....	Belleville.	Vandewater, Dav..	do
Richie, Thomas....	do	Vandewater, P. C.	Cannifton.
Robertson, Alex....	do	Vanderwort, B. H.	Walbridge.
Relyea, G. V. R....	do	Vermilyea, Thos..	Cannifton.
Reesor, D. Hon....	Markham.	Vantassel, S.....	Moir.
Read, Edwin.....	Frankford.	Webb, Geo.....	Colborne.
Redlop, G. K.....	Tweed.	Williams, J. F.....	Culloden.
Roblins, Robt.....	Madoc.	Warton, H. E.....	Kingston.
Robinson, Robt....	Thomasburg.	Wilson, Benj.....	Bridgetown.
Rowland, H.....	Ingersoll.	Williams, S. B....	Farmersville.
Read, Caleb.....	Cannifton.	Woodward, Jno....	New Durham.
Ross, A. Z.....	do	Walbridge, J. S....	Belleville.
Read, Edwin.....	Belleville.	White, R. S.....	Picton.
Rose, George.....	Halloway.	Wells, Thos.....	Belleville.
Richardson, L. R..	Kerwood.	Wreese, O. R.....	do
Sickles, Geo. S....	Belleville.	Walker, J. W.....	do
Sinklater, Thos....	do	Walbridge, W. H..	do
Smith, S. B.....	do	Wilson, Dr.....	do
Sells, Chancy.....	Huntingdon.	Ward, M. D.....	do
Sprage, John.....	Ameliasburg.	Way, Sedney.....	Chapman.
Strong, P. W.....	Brockville.	Waring, J.....	Picton.
Story, B.....	Picton.	Welbourn, Wm....	Halloway.
Smith, E. F.....	Belleville.	Whetton, Jas. Jr..	Burnbrae.
Solmes, D. B.....	Northport.	Wright, Wm. R....	Athol.
Spencer, W. E....	Roblin.	Way, Geo.....	Chapman.
Slater, Chas.....	W. Hampton	Wilmott, S. T....	Walbridge.
Sells, E. G. F.....	Frankford.	Waldridge, C. S...	Belleville.
Stafford, Wm.....	Rednersville.	Walbridge, Elias..	do
Sheffield, Jas. R..	Moir.	Walbridge, Asa....	do
Sutherland, W. & J.	Belleville.	Ward, W. A.....	Halloway.
Tyndall, Peter....	Branchton.	Wright, Alex.....	Walbridge.
Tallman, G. E. W..	Belleville.	Walbridge, T. C...	Belleville.
Truaish, B.....	do	Wilkinson, Jno....	Ingersoll.

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Names.	Residence.	Names.	Residence.
Weaver, M. S.....	Freeport.	Young, F. E.....	Picton.
Weekes, N. P.....	Batony.	Yeomans, J. W....	Belleville.
Williard, X. A.....	Utica, N. Y..	Youker, Samuel...	Halloway.
Wickson, Ed. J....	do	Young, Thos.....	East Lake.
Whitelaw, R.....	Beachville.	Zwick, J. H.....	do



TRANSACTIONS
AT THE
SEVENTH ANNUAL MEETING
OF THE
Dairymen's Association of Ontario,
HELD IN THE
TOWN HALL, BELLEVILLE,
ON
WEDNESDAY AND THURSDAY, FEB. 11th and 12th, 1874.

On Wednesday morning at half-past eleven o'clock the Convention assembled in the place of meeting, and neither the President, Thomas Ballantyne, Esq., nor the Vice-President, K. Graham, Esq., was present.

Mr. Peter R. Daly moved, seconded by Mr. Henry Ostrom, that Mr. Wm. S. Yates take the chair *pro tem*, which was agreed to.

On motion duly made and seconded, the Chairman appointed the Standing Committees, as follows:—

Committee on Order of Business—Messrs. Chadwick, Rowland, Bowerman, Wilmott and Brodie.

Committee on Finance—Messrs. Daly, Noxon and Bird.

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Committee on Nominations—Messrs. Vandewater, Casswell, McLean, Ostrom and Yates.

In a few minutes the Committee on Order of Business submitted their first report, which was as follows:—

To the President and Members of the Dairymen's Association of Ontario:

GENTLEMEN,—

Your Committee hereby recommend that upon the assembling of the Convention at two o'clock, Prof. Bell will deliver the Annual Address of the Association.

At its close your Committee would recommend that Questions One, Two and Three, of the general programme, be discussed till half-past five, when the Convention do adjourn till seven o'clock, when upon re-assembling, the Hon. X. A. Willard do deliver an address on the "Production of Milk and Some of its Characteristics."

All of which is respectfully submitted.

C. E. CHADWICK, Chairman.

Committee Room, Belleville, Feb. 11, 1874.

The report was adopted.

The Convention then adjourned until half-past one.

AFTERNOON SESSION.

At two o'clock Mr. Yates again called the Convention to order, and announced that neither the President nor the Vice-President had made their appearance, but he had received intelligence from the Vice-President that it was improbable that he would arrive to-day. He had not received any information as to the time when the President might be expected. Mr. Yates then invited the former Presidents of the Association, who were in the hall, and also a number of gentlemen from New York State, who were present, to take seats on the platform. He then called upon Professor Bell, of Albert College, to deliver the Annual Address, which will be found elsewhere in this pamphlet.

At the conclusion of the address,

Mr. Chadwick said—I rise to propose a vote of thanks for the remarks which we have just heard from Prof. Bell. I think a motion of this kind is only due for the forcible and clear man-

ner in which he has dealt with the cheese making interest in the address which he has just delivered. This is an interest which we see growing in importance every year, and it is one which can only be developed by gathering information in this way from time to time, and then receiving benefit from this information by applying it practically. I think no gentleman present can have heard the remarks of Prof. Bell without having profitted by them. I hope that we shall often have the pleasure of hearing the learned professor on occasions of this kind, and that we shall derive benefit from what he says. I am quite certain that when he visited us in Ingersoll a year ago and delivered a lecture on this subject, we were much gratified and delighted by his remarks, and I believe I will be but expressing the views of all present by saying that we have been much interested and delighted on this occasion. I believe that much practical benefit has flowed from these gatherings, and will continue to do so in the future. I have very much pleasure in moving a vote of thanks to Prof. Bell.

Mr. James Noxon said—I have much pleasure in seconding the motion that has just been made, and in seconding it I have to express my greatest satisfaction at meeting you here to-day. Coming, as many of us do, from what we may call the older school of dairying in the west, we yet expect to learn something in this newer one in the east. As the learned lecturer stated, we established the Dairymen's Association there some six years ago, and while we claim to have considerable knowledge with reference to dairying, we do not claim to have all the knowledge. We find that while we have turned out some apt pupils in the west, you are keeping up a good school here. We find also that there is a noble emulation springing up among dairymen everywhere, a desire to make Canadian dairy produce rank among the best in the world. I believe that one of the causes of the establishment of this society was that Canadians had become determined no longer to be behind our neighbors on the other side of the line in the art of cheese-making, and I think that we may congratulate ourselves on having nearly accomplished what we set about doing, and that we now stand shoul-

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der to shoulder with our brethren south of the lakes in endeavoring to gain the control of the English market. When we first tried to spread information with reference to cheese-making in Canada we found that there was a great deal of difference between American and Canadian cheese, but that the only reason for this was the ignorance which prevailed among our people with regard to the art. To dissipate that ignorance and let in the rays of light was one of the objects of our Association, and I think I may point to the Canadian cheese in the English market as a proof of our success. I think I may say that the tide which is spreading here will continue to spread over your land, and tend to your having a fuller purse at the end of the year than if you gave your attention wholly to serials. These periodical conventions have done us a great deal of good in the west, and I have no doubt that you will experience the same result here. But there is one thing that we have learned which I am sorry to see you have not, that is to interest the ladies in our work. They may be said to be our right hand men in it, (laughter,) and we should have had no real success if they had not come up and stood side by side with us, for it is they who put our theories into practice. Until we can get the ladies to come here and see the importance which attaches to this matter, we shall make very poor progress. I have only to conclude by stating that I very cheerfully and heartily second the motion which has been made.

The motion was then put and carried.

Mr. Willard—I would ask Prof. Bell if his objection to manure cellars under barns would not be removed if we could use dry earth to absorb liquid portions of the manure?

Prof. Bell—I think that the use of earth would hardly obviate my objection entirely. I think that the earth could hardly be procured in sufficient quantity to do so, and that the application of it would involve a great amount of labor and expense. I think that the removal of the manure to a shed at a sufficient distance from the cellar to prevent the injurious emanations from the manure entering into the lungs of the animal, is a plan that

might be adopted, and one which would be less expensive. Manure requires to be mixed up and amalgamated, as it were, to get the full effect of fermentation. I think that the use of earth therefore, although it would partly obviate the difficulty to which I have referred, would hardly remove the whole.

Mr. Willard—I mentioned this fact because I have seen some manure cellars in which earth is used. Mr. Treesdale, whose farm is called the model farm of this continent, keeps some thousands of cows, and he keeps the manure under his barn. He drives in every fall a large quantity of dry earth and scatters it in the centre of the manure cellar. He has a tight floor which the cows stand upon, and there are openings behind them through which the manure is pushed down into the cellar every day. A man goes below, takes a shovel, and throws the dry earth upon the manure as it is cast down, and in that way his stable both above and below is just as clean and sweet as any stable that I ever saw. Then again there is Mr. Almon Mecher, the great farmer of England, near London, who keeps his stock on a sparred floor, from which the manure drops immediately into the cellar, and every day or two, when the manure has accumulated, he lets in water, and the manure is reduced to a liquid state and pumped into a large tank, and then distributed over the farm.

Prof. Bell—In the hands of such a gentleman as Mr. Willard mentions, perhaps the practice might not be so very objectionable, but in my remarks I referred to the farmers all over the country. I do not think they would take the amount of labor necessary to perform all these operations, nor go to the expense of the necessary buildings, or alterations in the barns they already have. Although heretofore such a practice might be comparatively objectionless in the case referred to, yet in general it would be liable to the condemnation with which I have mentioned it.

FLOATING CURDS.

The Chairman then announced as the first topic to be considered, "The Cause and Prevention of Floating Curds," and called upon Mr. Peter Frederick to open the discussion.

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Mr. Frederick—I think I have been engaged in the manufacture of cheese for about seven years, and my experience during that time relative to floating curds (a little of which I shall relate) may be of some benefit. Perhaps there are not five men in this room who would agree as to the cause of floating curds in every case, perhaps only those gentlemen who have gone into chemical analysis, and so on. But I have noticed that the milk from cows that have been running in buckwheat pasture is very apt to produce floating curds. I have tried to experiment on this point somewhat. I have taken the milk brought in from certain routes and placed it in particular vats, and I have come to the conclusion, from my own experience in this way, that the eating of buckwheat by cows is a cause of floating curds. I think that when cows graze on low pasture—swaley grass—that their milk is apt to yield floating curds. Some say that it is the surroundings of the milk in the factories which causes floating curds. I do not think that is the cause. I have manufactured in factories where we have had the pigs almost inside the door, and where the water has settled under the buildings, and we have produced very good cheese. I think the cause of floating curds is to be found in what the cow eats, or in the treatment it receives, rendering the milk heated. The plan I have adopted is this. I take in the milk in the morning as early as I can get it. I make it up at night, and keep it until the morning. If I think that the milk is in anywise impure, I do not try to cool it down immediately. At night I cool it down to about 78°—not a very cool degree—and before I go to bed I add about a quart of salt to about 1,500 pounds of milk, and use an Allguire agitator. This prevents the cream rising to the surface of the milk, and all cheese-dealers will agree with me that when this is done the milk is kept in a purer state. I then let it remain there until morning, when I put it in my morning's milk, and I do not use as much rennet as usually. All practical cheese-makers know the effect that rennet has on the milk; if we want cheese to cure up in thirty days, we use as much as will cause a coagulation in a certain time, and if we want it to cure in fifteen days, we only use about half as much. I, only in

this case, use enough to make coagulation take place in about fifty minutes, or from that to an hour. My idea is that cheese made from floating curds should go into the mouth of the consumer as soon as possible. I go on with the cutting of the curd in the ordinary way, except that I make it finer, because I believe that a great deal of the impurity remains in the whey. Then I allow it to remain in the vat until, by the application of the iron, about three fourths of an inch is drawn out, which takes away a great deal of the acid. My experience teaches me that this is actually necessary, especially, unless we have a curd mill. I next put it to press, if I have a curd mill, and press it a short time, after which I take it out, grind it and salt it in about the proportion of seven and an eighth pounds of salt to one hundred pounds of curd; I add a little more salt to floating curds always. I next put it in my curing room, and I endeavor to watch it, and as soon as I think it is ready for the market, I shove it on. By so doing I have had no difficulty, although I have had a great deal of floating curd; some seasons I have had as many as three curds float a day, perhaps for weeks. I think the cause of floating curds should be considered by farmers who have cows and send their milk to us, because I believe there is where the evil could be prevented, and might be to a great extent. I use the horizontal cheese knife, which I think is an advantage, as with it I can cut the curd in a very tender state. I put the knife carefully down at the end and pass up and down the vat without taking it out. This is very important for us all who use the knife to know, to remove it will injure the curd a great deal. By passing all around the vat in this way I remove all the whey in which, as I have said, I think the impurities are to a great extent contained. When I have the curd in my sink I take a little warm water—not hot—and rinse it a little before setting it. I remember sending some cheese made from floating curd down here to an exhibition, and it brought me about \$50 I think, as a prize. I am of opinion that by carefully observing the mode of treatment I have described, I can successfully deal with floating curds—that is provided they go into the hands of consumers as soon as possible.

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Mr. Edmund Reid—You assume that floating curd is produced in the treatment of the cow, and not at any time in the treatment of the milk?

Mr. Frederick—I assume it originates with the cow or the food she eats. Cows sometimes have their udders bruised in passing over bars. This is another cause. I do not think floating curds are to be accounted for by any treatment the milk receives after going to the factory.

Mr. Casswell—Were floating curds as frequent last year as in previous years?

Mr. Frederick—No, they have not been as common; last year was exceptionally cool. I think that the salting of the milk the night before it is used has an excellent effect. I do not know that this is generally practiced, but I make it the rule in hot weather.

A Member—What do you discover in the milk which induces you to treat it in this way the night before you are going to make cheese?

Mr. Frederick—The milk has a peculiar taint about it. I do not know that I could describe it. It has not that sweet nutty smell which is usually found in pure milk.

Hon. D. H. Burrell, Little Falls, N. Y.—Does not the milk seem bitter?

Mr. Frederick—I do not think it does.

A Member—Do you think buckwheat produces bad milk? It makes the best honey. (Laughter.)

Mr. Frederick—I do not think it will make good milk. You cannot turn pigs into it but they will scratch over it.

Another Member—Do you cool a floating curd any lower than any other curd before you put it in the press?

Mr. Frederick—No! The grinding gives it a chance to air, as also does turning it in the sink.

Mr. E. Brentnell—I made cheese nearly three years before ever I saw a floating curd; I do not think I have had over half a dozen in six years making, and I cannot tell you anything about them. You know, however, that we have them generally

in the early part of the summer, when we have not much buckwheat. I cannot therefore agree with Mr. Frederick as to their cause. I cool down to 30°, which I think the best way of keeping milk and preserving it from floating curds. Milk sometimes comes to the factory with a bad smell, and when this is the case you generally have bad curd the next day.

A Member—How do you treat floating curds when you have them?

Mr. Brentnell—I never take any precaution to prevent them. I just use my own judgment in taking care of the milk and in receiving it into the factory.

A Member—It is the treatment of the curd I refer to. Do you treat it as an ordinary curd?

Mr. Brentnell—The first floating curd I ever had I took it out of the vat, and after I had salted it, I put it in another place until it got cool. I then cut it and pressed it, and I did not see much difference between it and other curds. I have a curd mill but never used it but once.

Mr. Daly—I would like to hear the views of Mr. Reesor, of Markham, who is a maker of fancy cheese.

Hon. David Reesor—Not being a practical cheese-maker I do not know that I ought to venture an opinion about a matter of such importance. It is true I have been interested in one or two cheese factories for the past two or three years, and so far as one can make observations in passing through a factory, sometimes spending hours in it, watching the operations, I might be considered competent to venture an opinion. If I did this I might say that I do not think that floating curds depend upon the existence of buckwheat in pastures, because in the region in which I reside they have no buckwheat, and they still occasionally have floating curds. I think they are owing more especially to the condition of the water, though they may to some extent be owing to the food that is given to the cow. If the water the animal drinks is very warm and the milk comes to the factory with a sort of a disagreeable smell—not that nice essential odour that the best quality of cheese has—you may look for floating curd, and if you get this you will find it impos-

sible to make a good cheese. I begin with the manufacture of market cheese according to the rise in price.

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sible to make a thoroughly satisfactory cheese. You cannot make a good cheese out of impure milk, and the secret of making the best cheese is to have the very best quality of milk to begin with. I think that when an inferior quality of cheese is manufactured, we make a great mistake if we shove it into the market as the best. We had better sell it for what it is worth, according to its merits, and then the name of the factory will rise in proportion to the quantity of good cheese made in it.

Mr. Frederick—For fear that my remarks with reference to buckwheat may have a wrong construction put upon them, I wish to state that I do not believe eating buckwheat by cows to be the only cause of floating curds. I believe there are various causes.

Mr. Wm. Bensley—I have had considerable experience in matters of this kind, but have always got along very successfully with them. I believe there are various causes of floating curds, and that the people who supply the milk should know more about them than anybody else. Leave a can setting for a while, when the cows are milked, in the stable, and then drag it through the sun a long distance to the factory, and, of course, a floating curd would result. Mr. Frederick spoke of preparing the milk over night. I could not tell what milk would make a floating curd until after it was in the curd. I have had curds that would dip in half an hour after they were heated up. I just cut my curds in the ordinary way, and when I find that one is going to float, I let every particle of it rise that will. I have tried the iron (which, of course, is a reliable test) for dipping curds, and that which was in the bottom of the whey, and not ready, according to the iron, to dip, I left a long time in the sink, and I have never had any huffy cheese.

Mr. Burrell—I can only add one suggestion to the remarks made by Mr. Frederick. I think his experience is exactly the same as that of our very best cheese-makers in Herkimer County. However, in the old Fairfield factory, which is one of the best of our factories, the proprietor is sometimes troubled with floating curds, and it is his practice to cool his milk down as much as he possibly can in the night. He cools it down to

about 70° only, and still keeps his milk sweet until the morning. His idea is that by allowing the milk to steam and sweat during the night rids it to a great extent, if not altogether, of the objectionable taint.

Mr. Bensley—Do you think you could keep milk at that temperature in warm weather?

Mr. Burrell—Sometimes he is obliged to reduce the temperature below that—down to 65°—when the nights are very hot. I have known him turn the water off half a dozen times a night. His success has been wonderful as a cheese-maker. He is undoubtedly the best in Herkimer County.

Mr. Phillips—Does he add the morning's milk before he mixes it up?

Mr. Burrell—He does.

Mr. G. D. Harris—My experience has been something like that of my friend, Mr. Brenton. I have made cheese now in this country six years, and never had a floating curd in my life. How that arose I cannot tell you, but I have heard a good deal about floating curds, and I think the pasture the cattle have has a great deal to do with them. In my opinion if cattle are kept upon low ground their milk is more apt to yield floating curds than if they are kept upon high ground. I know from experience that the best cheese is made from the milk of cows that are pastured upon high ground, provided they have full access to water. I think another thing that has something to do with floating curds is the condition of the cow. I think if the cow is driven home to milk in a hurry, her milk is very apt to give a floating curd. Then there is the cow's health. I think that if you send your milk to the factory when your cows are in "a certain condition," you ought not to blame the cheese-maker if he makes you a bad cheese. A great many cheese-makers are blamed for giving you "huffy" cheese, when it is you who ought to be blamed for sending them your milk in a bad condition. I have heard, myself, persons living near the factory say, "Oh! here's the milk waggon coming, hurry our cows up," and the milk is taken from the cows, put right into the cans, and

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sent to the factory. And yet they expect to make good cheese out of that. No man in the world can do it.

On motion of Mr. Daly, the question was then laid on the table.

THE HANDLING OF MILK.

The next topic on the programme was then taken up, viz.: "The Best Methods of Handling Milk at the Farm and House, and Hauling it to the Factory."

Mr. S. T. Wilmot being called on to open the discussion, said—I feel that there are others in this Convention that could throw more light upon this subject than I can, although I have had considerable experience in connection with the dairy business, and have tried to instruct the patrons of the factory, with which I am connected as to the best method of handling milk. In connection with the factory with which I stand identified, we have seen the need of a good deal of instruction being given to patrons on this point. With regard to the best manner of handling milk, I think the great point is cleanliness; that we should begin with the pails and cans, and that if they are thoroughly cleansed one great point has been gained towards securing a good quality of milk. These pails and cans should be thoroughly cleansed each time with boiling water, which, as is known, will destroy infection, but nothing short of that. If only blood warm water is used you might as well use cold water. The next thing which appears to me to be important is to observe cleanliness with regard to milking. It strikes me that if the cows are milked in dirty stables, and dirt is allowed to fall into the can, that milk will likely be injured, perhaps, in its keeping qualities. Then I think it is very important that milk should be drawn from the cow a short time before being sent on its way to the factory. It has been said—and I think so, too—that it is unwise to hurry cows up to the milker, draw the milk from them quickly, and then throw it immediately into the can, close the can with the tight-fitting lid, and hurry it away to the factory at once. It has always struck me that if cows could be driven up to the milking place slowly, and milked, say half an hour before sending it to the factory, and if, instead of the milk

being thrown right into the can, it were kept in milk pails for a while, it would cool far better than if it were differently treated. However, it might be thrown into the cans, if before the lid is placed on them and they are put on the waggon to be carted away to the factory, the milk were brought down to as low a temperature as possible. I believe that if immediately upon the milk being drawn from the cow, you cart it away with all its animal heat in it, to the factory, it is greatly injured. With reference to keeping milk home over night when you are only sending once a day, my experience has been that the milk should be well cooled. I know of very many in the same factory I am connected with who have kept theirs in a perfectly sweet state by adding water—not to the milk, mind—(laughter) but by inserting a cooler into the can, and putting cold water into that. But we find that if we do not change the water, the effect is worse than if we used no water at all: because, although the cold water will draw the animal heat out of the milk, it will, I believe, throw it back again. My plan is, after the heat has partly been drawn out of the milk, to empty out the water and put some fresh into the cooler, and in this way I have been able to keep my milk. As regards hauling the milk to the factory, I believe it should go as early as possible, especially in the morning. People do not want to milk early, we find, but I have urged it upon them as a necessity: I have said, “The weather is extremely warm, and we want to get this milk to the factory as early as possible, and it is to your interest to milk fifteen or twenty minutes earlier than at any other season of the year.” I think that if the waggons, in which we send our milk to the factories, had awnings over them, it would be a great advantage inasmuch as these awnings would keep the rays of the sun from striking upon the milk.

Mr. Ostrom—Do you not think that it would be better to use cold water and then hot in cleansing the pails and cans?

Mr. Wilmot—We have invariably required of our teamsters, if they retain their tins on the milk waggons, to rinse them with cold water.

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Mr. Ostrom—Do you not think that the best way to cleanse a milk pail is to rinse it first with cold water?

Mr. Wilmot—Oh, yes; I think it is—to get the milk properly out.

Mr. Harford Ashley—I am sorry that our farmers, although there are a good many here, do not take more interest in attending these meetings of our Association. My method of handling milk at the farm is to have my stables perfectly clean, to put my cows into the stables when I milk them, and to let them stand at least half an hour before milking. It is important that cows should be allowed to spend a short time to cool after coming from the pasture, and before milking, particularly if, as is frequently the case, milking has to be done early in the evening, and the cows have to come some distance in the heat of the day. Then, I think, the cows should be milked as quickly as possible, and the milk strained as soon as it can be; and I would like to see the milkers do their work without putting their hands in the milk. It is certainly not a clean practice to allow your hands to be wet with the milk, and then let the milk drain off them into the pail, thereby getting an odor into the pail, which it is almost impossible to get out again. I think the milk should be strained immediately, and the strainer so arranged on the can that the air could get in. Then, my opinion is that the milk should be cooled a little. If it was stirred a little, all the better, and, I think, our farmers should have a clean paddle, or a dipper of some kind, and every time they go to strain the milk, dip it a little, to let the animal odor escape. The covers should never be placed on the cans till the milk-man comes along, and he should do that himself. I have had considerable trouble with some of my patrons about covering their cans at once, by means of which the animal odor is kept in the milk, and a certain musty smell thereby caused. I think the milk should be got to the factory as soon as possible. After the milk-man starts from the house of the first patron, the others should not keep him waiting. Then, I think that the milk should not be cooled immediately upon its arrival at the factory. I am not a practical cheese-maker, but I give my opinion as de-

rived from observations in going through the factory. I think that our cheese-makers endeavor to cool their milk down in the evening too quickly. Another fault with some of them, I think, is, that they endeavor to cool it down too low, and I was very glad to hear the remarks of the American gentleman, who spoke with reference to the Fairfield factory, that milk should only be cooled down to about 65°. I do not profess to lay this down as a rule, but give it as the result of my observations.

A Member—What plan should we adopt to keep Sunday's milk until Monday morning?

Mr. Ashley—I think it should be cooled down, but, like the other milk, not cooled down too quickly. It should be well ventilated, and carefully kept. I think it might be made a little cooler than if you were just keeping it over night. The way I do at my factory is this: I strain the milk into the vat, that gives it a large surface, which allows all the odour to escape. I then cool it down by pumping water around the vat.

Mr. Madden—I would ask if anyone here has ever made worse cheese when he has cooled his milk down on Saturday night for Monday morning?

A Member—Yes! I have.

Mr. Madden—The reason I ask is that the factory I represent, had for many years floating curds, but since we have had it, we have not had any. Some factories are not kept very clean, and, I believe, the milk draws infection from the decaying matter about them. I have known the people, who had the factory I represent, throw the whey on the floor and allow it to run through, and they complained of floating curds and "huffy" cheese. We have never had either of these. When I went into this factory, I cleaned up the place, and have kept it clean. The method we employ in manufacturing our Saturday night's milk is this: We get the milk in about seven o'clock and cool it down to about 70°, then we beat up before we set, and we had our curd in the press, and many a time turned, before twelve o'clock, and we have always been able to make as good, sound and hard a cheese, out of Saturday night's milk, as out of any other.

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Mr. Casswell—Have your Saturday night's cheese usually been as firm and close as other cheese ?

Mr. Madden—Yes.

Mr. Casswell—If you will give us an idea how you make this cheese it will be a great benefit to the whole factory business.

Mr. Madden—When we make our Saturday morning's cheese, in the afternoon, the first vats runs off and we fill generally two thirty-gallon cans with whey, and if we have 3,500 or 4,000 pounds of milk, we commence as soon as we get our milk in. We add from a can to a can and a half of whey, and work it just as we usually do.

Mr. Ostrom—Would the yield from milk made up on Saturday night be equal to that from milk made up in the usual way ?

Mr. Madden—Yes, just as good ; I think the cause of that is the getting of the acid out of the milk at once instead of waiting all night for it.

Mr. Frederick—But by getting out the acid that fast you reduce the butter.

Mr. Madden—We retain that butter in the cheese.

Hon. Robert Reid—The only point I would speak upon would be keeping the Sunday's milk. I place the cans in a very airy place out of the sun and first put water round the cans. When the milk is cooled down pretty well, I add in the water, and I have never had the slightest difficulty. The trouble and expense of this is very little. Ice is very cheap and easy to be had, almost everywhere in the country. I have cut some large puncheons, into which I put the cans ; I stir the milk as it is cooling down, and afterwards put some ice into the water. We keep a daily record, and, I think, if our books were here, we would find that the Monday's milk has a much better average than that of any other day.

Mr. Casswell—Do you keep your milk at home or send it to the factory ?

Mr. Reid—I perhaps set it in my barn where a good current of air gets through. I put the cans into half a puncheon, fill that up with water, stir the milk two or three times, and, after

half an hour or about an hour, put some ice around the cans and the milk goes to the factory during the Sunday night, because there would be quite enough for a large load on Monday without it. I think, from what I have heard, that the general opinion is, the older the milk, the better the cheese, provided the milk is sweet.

Mr. R. B. Ross—Are the patrons able to keep the Saturday night's milk?

Mr. Reid—We send the milk off Saturday night, and it is made up.

A Member—On Sunday?

Mr. Reid—I don't know when it's made. (Laughter.)

A Member—Do you put the ice in the milk?

Mr. Reid—No. (Laughter.) For a year or two that system was adopted. We were instructed to weigh the ice and put it in the milk. (Renewed laughter.)

Mr. Pashley—A great many of our farmers do not live near streams of water. How are they to get ice?

Mr. Reid—Oh, there are very few of our farmers who cannot get ice within a few miles. Some of our farmers let their cans down into a well.

Mr. Frederick—I am one of those who strongly protest against sending milk on Saturday night, to cause the manufacturers to break the Sabbath. In both of the factories we manage we keep our milk from Saturday night to Monday morning.

The Chairman—The whole season?

Mr. Frederick—Yes. We keep our milk all through the summer. We use the agitator.

Mr. Bensley—The milk taken directly from the cow, and cooled, makes the best cheese. We tried keeping milk over Sunday, and never made a good cheese. I do not think there is as much sin in manufacturing the milk on Sunday as in keeping it home and fussing over it all day there.

Mr. Thos. Watkins—There are only one or two points I wish to touch upon, and I may just say before coming to the subject of the discussion, that I have generally found no difficulty

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in distinguishing cheese made on Saturday night from that made when more time has been allowed.

Mr. Frederick—A great many of our cheese-makers have not been able to detect any difference between the cheese made on Monday and that made on other days.

Mr. Watkins—I do not know that I have observed any difference.

A Member—Have you not found good cheese made on Saturday night?

Mr. Watkins—As a rule I have found them soft and porous.

A Member—Have you never found any difference between cheese made of milk drawn twice a day, and that made from milk drawn once?

Mr. Watkins—As a rule I have found it better if made from milk of one drawing.

Mr. Bensley—Could you pick out the cheese made from Saturday night's milk, at my factory, as easily as you could at other factories?

Mr. Watkins—No.

Mr. Bensley—What is your opinion of cheese pressed by the gang press?

Mr. Watkins—I have never been able to detect any difference between it and cheese pressed otherwise.

Mr. Casswell thought that one very good result of these meetings was the discussions that take place between the factors, the cheesemen and the milkers. He thought that in the future a little time ought to be set apart for farmers to discuss these matters among themselves. He contended from what he had seen that good cheese was greatly dependent upon cleanliness. He had been to several factories where he had asked the question, "What is the matter with this cheese? How is it that from a certain date up to this time your cheese is not as good as before?" The farmer would reply that for the cheese spoken of he had not had as much milk as usual. He asked Mr. Bensley did he make the cheese he spoke of Saturday night or Sunday morning?

Mr. Bensley—I made it Sunday morning.

Mr. Casswell—Then it was not Saturday night but Sunday morning cheese. Another thing I have often heard spoken of as whether it would not be possible, through the hot weather, to have the milk waggon covered with cotton, or something of the sort, to protect the milk from the sun's rays. With regard to Saturday night's cheese, I think any dealer who is here will bear me out in the statement, that I have never found a man who likes Saturday night's cheese, and I do not know a man who has dealt much in cheese, but can tell the difference between that made on Saturday night and that made at other times. Saturday night cheeses are generally "huffy," and have not that quality which cheese ought to have.

Mr. Bensley said that he felt he was not breaking the Sabbath in making up his milk on Saturday night. The work was all done before Sunday morning, except the dipping out of his vats. He alleged that he never went into a factory yet but the proprietors called the bad cheese Saturday night's cheese, and perhaps when he came to look at the date he would find that it was made on Tuesday. He felt that it was impossible to avoid doing this work on Sunday, and that there was no more harm in doing it than in doing any necessary work about a farm. If they allowed their cheese to stand in the vat from Saturday night to Sunday morning, neither the yield nor the quality was as good as if it were made up when it should be.

A Member asked Mr. Bensley what time he got the Sunday's work done?

Mr. Bensley—About four or five o'clock.

Mr. Albert Ward said that he was satisfied that no person could go to work with milk directly from the cow, and make it into a first-class quality of cheese. He had been obliged ever since he manufactured cheese to make up his milk on Saturday night on account of not having good water, and not being able to get ice, and he had always noticed that cheese made in that way was not as good as that usually made. He did not think that cooling down to 60 °, and then raising the tempera-

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ture in setting, would benefit the milk at all, unless it was stirred and exposed to the air, so that the animal odor could be allowed to escape.

Mr. Casswell said that a gentleman had just suggested to him that it would be just as well to put cotton around the cans and dash cold water upon them. The heat of the milk would thus be reduced immediately.

Mr. Frederick observed that the milk of the two factories with which he was connected was kept at the farm houses from Saturday night to Monday morning. The waggons then brought it to the factories and it was manufactured into as good cheese as any made during the week.

Mr. Riley Ellsworth—Do you approve of putting ice in the milk?

Mr. Frederick—No! It freezes the particles of milk. In reply to a question he said that the cheese made on Saturday night would suit the trade as well as that made from other nights' milk. The objection to it was that the flavor went off it quicker than off other cheese.

After a little further conversation the question was laid on the table, and, it being half-past five o'clock, the convention adjourned until evening.

EVENING SESSION.

When the convention re-assembled at 7.30 o'clock, Mr. Yates again took the chair, and having called the meeting to order, he introduced Mr. X. A. Willard, M. A., who proceeded to deliver an Address, which will be found in another part of this work.

At the conclusion of the address,

Hon. Mr. Reesor said—I have much pleasure in moving a vote of thanks to Mr. Willard. I think that never since the formation of the Dairymen's Association have we had a better lecture.

Hon. Mr. Read—I have great pleasure in seconding the motion, and in doing so I may as well remark that in my opinion—and I have heard Mr. Willard several times before—this

is one of the most practical lectures he has ever given. However it is a thing that I do not know that I can give him much credit for. He has been practising for some time and he ought to be able to deliver a good lecture.

The motion was then put and carried.

The Chairman—Since we have been in the hall this evening, a telegram has been put in my hands, from the President. It reads as follows: "Very much regret that I cannot be at the convention to-night, owing to the elections. Please apologise for me."

The convention then adjourned until 9.30 o'clock next morning.

SECOND DAY.

The convention resumed at 10 o'clock, a. m.

The Chairman of the Committee on Nominations reported as follows:—

To the President and Members of the Dairymen's Association of Ontario:

GENTLEMEN,—The Committee on Nominations beg leave to present their report, and would recommend the following gentlemen as officers for 1874:—

President—K. Graham.

Vice-President—A. Oliver.

Secretary—J. C. Hegler.

Treasurer—P. R. Daly.

Directors—T. Ballantyne, W. S. Yates, L. Richardson, H. Ostrom, T. D. Millar, D. Vandewater, A. McLean, G. Morton and T. Brown.

Auditors—C. H. Sorley and Thos. Wells.

All of which is respectfully submitted.

D. VANDEWATER, Chairman.

Committee Room, Belleville, Feb. 12, 1874.

Mr. Daly, seconded by Mr. Frederick, moved the adoption of the report.

Mr. Casswell said that although a member of the committee which submitted the report, he wished some one else appointed in his place. He positively would not act.

Mr. James Noxon moved that the report be referred back to the committee, with a recommendation to submit some name instead of that of Mr. Casswell.

Mr. Daly said that he would withdraw his motion in favor of that of Mr. Noxon. When he made his motion he was not aware of the position Mr. Casswell intended to take.

Mr. Noxon's motion was then put and carried.

COLORING OF CHEESE.

The next topic on the programme was then taken up, viz : "To what extent is it desirable to color cheese, and what annat- to is best."

Mr. Casswell was asked for his views on the subject and said—You all know pretty well my mind on the matter of coloring cheese. I have heard since I have been in Belleville that there is a great diversity of opinion with regard to coloring cheese, and that there is a great demand for white cheese. I should like to hear the opinions of some local members before I speak.

A Member—I think you had better proceed. You will have an opportunity of speaking again.

Mr. Casswell—I should say then, for London, high-colored cheese ; for Manchester, pale ; although the highest price I have sold high-colored cheese for was in Manchester. In Birmingham they say "a nice straw color." But I think you could flood the market with white cheese. My correspondents generally say "well-colored," but once in a while they say "pale." I notice that the buyers generally select the well-colored cheese and pay a high price for it, even though they advocate the making of pale cheese. If you go into the Liverpool markets you generally find that the highest prices are paid for high-colored cheese. In every order I ever received, of any extent, eight tenths of it was for well-colored cheese ; and when I see, even gentlemen who deal in the markets where pale cheese is required, asking for colored, I think there must be something in favor of well-colored cheese. Bath is a market where pale cheese is wanted, but not to a very great extent. If I said any-

thing with regard to which annatto I think best, of course it will be said I am grinding my own axe, but when I take up any color, I do so because I think it is a good one, and I do not think any man can say that there has been very much made out of annatto. The competition is so great that it is actually sold here cheaper than in England, where it is made. Whenever we have introduced Mitchell's annatto they have, in nine cases out of ten, used it exclusively. I believe it is a pure annatto, and you always know what quantity is required, which you are not so certain of, if you make up your coloring yourself.

In answer to a question, Mr. Casswell said that in spring it was necessary to use a little more color than at any other season, in order to give the cheese a ripe appearance, and deception was the order of the day.

Mr. Watkins said he considered coloring cheese to be an unnecessary evil. The greater portion of the English people must have their cheese colored, but there were certain parts of the country in which the people preferred, and had been in the habit of using, white cheese, for very many years. For instance, in Staffordshire, and all through what is called the Black Country, white cheese is liked best. Manchester also preferred it, and he had even during the past season seen white cheese shipped to the London market. He was of opinion that the ready sale of cheese depended to a much greater extent upon its quality than upon its coloring. If they colored at all, it was certainly advisable to make a full-colored cheese, but not a too highly colored one. It was possible to overdo the thing, and he wished to lay great stress upon this, for he had seen in Montreal, about twelve months ago, cheese which was colored to such an extent that it was nearly red, like blood. This had been colored expressly for shippers, but he had never seen anything like it before. From all he could learn he came to the conclusion that the cheese-makers of Canada would be perfectly safe in making about one fifth of their cheese pale. Extreme colored cheese was not wanted in the English market. What was desired was either as white a cheese as could possibly be made, or one which was full-colored. He was

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strongly of opinion that the liquid annattos were much preferable to the cake, or any other kind. He thought the former mixed best, and gave a brighter color. He believed that both Nichol's and Mitchell's were good annattos, and he did not think they could have better brands in the market. From experience, however, as well as from what he had heard, he thought he would give Nichol's the preference.

Hon. Mr. Reesor said that the dealers were the persons best qualified to judge of the extent to which makers might safely carry the coloring of cheese. He had been a dealer and a manufacturer to a moderate extent, and his experience had been that almost everything depended upon the quality of the cheese. If they had color without quality, their cheese would not sell, but if they combined quality with a good color, the latter might help a good deal to dispose of it. As a rule his customers required cheese to be tolerably well-colored, but a few preferred it rather pale, and some liked it of a medium tint.

Mr. Leech—Does the coloring add anything to the flavor of the cheese, or does it have any effect on it?

Hon. Mr. Reesor said that to arrive at a conclusion with reference to that point, he thought it would be necessary to analyze the cheese, and make a good many experiments, and also to obtain the opinion of persons of very acute taste. He was unable to discover any material difference between the flavor of colored and that of uncolored cheese. He was satisfied, however, that coloring did not improve the flavor; whether it, in a very infinitesimal degree, injured it, he could not say. He thought that if they had a good quality, and then a good color, they would have perfection in cheese.

Mr. Burrell said that it was their opinion on the other side that it was best to dispense with the use of annatto, if it could be done, and the same prices obtained for the cheese without it as with it. But they all knew that the market required a colored cheese, perhaps two thirds or three quarters of it must be colored yet. It would be an advantage to dairying when coloring could be done away with entirely, but they knew that the London markets required nicely colored cheese. The thing,

therefore, was to obtain a coloring matter which is harmless ; and annatto was entirely so. In Brazil, where annatto is obtained, the natives used the pulp of it for flavoring their rice. In New York State they used annattoine, which was made by Mr. De Cordova, of New York City. The speaker described the process of preparing this, and said that it was the least objectionable coloring matter they could find, and that all the factories in New York State, which had taken first prizes at the fairs, had had their cheese colored with it.

A Member asked if Mr. Burrell had ever noticed cheese fading which had been colored with annattoine ?

Mr. Burrell said he had not. Cheese had been experimented on with a view of ascertaining what the keeping qualities of annattoine coloring were ; it had been kept two years, and at the end of that time, the color was stated to be unimpaired.

Mr. Casswell said it was not for them to say whether coloring was a benefit or not. The English people wanted it colored, and they must therefore send it to them colored. One reason why they liked it colored was that color hides a multitude of faults. Many cheese of poor quality was much improved in the appearance by being colored, and a defect was much easier detected in white than in colored cheese. The fading of cheese depended much upon the atmosphere in which it is kept, and in cheese which decomposes easily, the annatto lost color quicker than in cheese of better keeping quality. Mr. Watkins had said that the English people did not want a straw-colored cheese ; but where he (Mr. Casswell) was, in Birmingham, one of the oldest buyers there told him that a certain portion of his trade wanted a bright straw-colored cheese, and that if he (Mr. Casswell) filled his order, he must send some cheese of that sort. But it was only a small portion of the trade that required it. Then, with regard to the Black Country, it was only the other day that one of the very finest factories of cheese in Oxford county was for sale, and Mr. John Byran, who had a brother in the Black Country, said that he would have given the owner his price for it, but that there was some of it white, and he wanted it for the Newcastle trade.

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Mr. Watkins—That is not in the district I mentioned ; that is not in the Black Country.

Mr. Casswell went on to say that he thought it would be very hard to educate the English people to like white cheese as well as colored, for an Englishman was very conservative, especially with regard to anything for which he paid his money. Some years ago, when he commenced the business, Canadians would scarcely buy colored cheese, but to-day he could not sell white cheese on his counter. They might depend upon it that instead of educating people to use white cheese, the more they got of colored cheese the better they liked it. The high color which Mr. Watkins spoke of having seen in Montreal, was not put into the cheese by proper annatto, but by adulterated stuff.

Mr. Watkins said he was always prepared to pay the same price for white cheese as for colored, provided the quality was as good. If they had good white cheese there was no trouble in selling it in England as easily as colored.

Mr. Parish asked which annatto was the cheapest to use. When one ran a factory and colored high, annatto was quite an item of expense.

Mr. Watkins suggested that several dealers should give their opinion in the matter.

Mr. Frederick said that both Mr. Burrell and Mr. Casswell were in the trade ; he would give his experience as one who, like Mr. Watkins, was not. He had tried the experiment in one of his factories of making only white cheese, and had been able to sell it at as high prices as the colored. He believed that if the factories united they could do away with coloring entirely ; they would be able to educate the people up to it. Time was when English buyers would laugh at them if they attempted to sell pale cheese, but now they could sell a good deal of it at as high prices as the colored. Of all coloring matters he would prefer the annattoine ; but Nichols' and Mitchell's were, however, good articles. He thought the basket annatto was the cheapest, but not the best. He did not think the liquid annattos were without impurity.

Hon. Mr. Reed held that they must cater to the tastes of their customers. What was the production of this country—what was the production of America even to the consumption of cheese in England? To show how the cheese manufactured in this country was going up in the estimation of the English people, he spoke of having seen recently displayed in different parts of London placards bearing the words, "Prime Canadian Cheddar Cheese."

On motion, the subject was then laid on the table.

The Committee on Nominations submitted their amended report, having the name of T. D. Millar inserted in it, in place of that of Mr. Casswell.

The report was received and adopted.

The Secretary read the Auditors' Report, which was as follows:—

To the President, Vice-President and Directors of the Dairymen's Association of Ontario:—

The undersigned Auditors of your Association for the year ending on the 11th of February, 1874, beg to report that they have examined your Secretary and Treasurer's books, and find the same correct, the balance in hand at their audit being \$112, 76, as appears by the following statements:—

TREASURER'S BOOK.

Balance in his hands, as certified to at last annual audit.....	\$ 14 55
RECEIPTS.	
From all sources	1063 66
	\$1078 21
PAYMENTS.	
Lecture, Prof. Caldwell.....	\$110
" Prof. Bell.....	40
" Prof. Willard.....	75
	\$ 225 00
Advertising, Ingersoll Chronicle.....	\$20 00
" Toronto Globe.....	9 60
	\$ 29 60
Printing reports.....	\$196 27
Miscellaneous printing.....	50 50
Reporting.....	15 00
R. A Woodcock, stationery and printing.....	9 75
Prizes	520 00
	\$1046 12
Leaving balance in Treasurer's hands,	\$32 09

SECRETARY'S BOOK.

RECEIPTS.

Members' subscriptions.....	\$16 00	
Entrance fees.....	56 00	
		\$ 72 00
Sale of 10 copies of report to non-members.....	\$ 6 00	
Received for advertisements on reports.....	86 50	
		\$ 92 50
Received from Mr. Ballantyne for prize.....	\$50 00	
Received from Mr. Hopkins for prize.....	25 00	
		\$ 75 00
		\$ 239 50

PAYMENTS.

Paid Treasurer.....	\$92 00
Paid Mr. Fearman.....	6 00
Paid Mr. McAdam.....	20 00
Paid postages.....	16 82
Paid express charges.....	1 30
Paid expenses two journeys to Toronto.....	17 00
Paid for stationery.....	3 41
Paid for cash book.....	25
Paid for telegrams.....	2 05
	\$158 83

Leaving balance in Secretary's hands.....\$80 67

Your Auditors having examined the Receipts and Vouchers for moneys paid out, find the same correct.

All of which is respectfully submitted.

THOMAS WELLS, } Auditors.
C. H. SORLEY, }

Ingersoll, Feb. 9, 1874.

MARKETING CHEESE.

The chairman announced as the next topic on the programme, "The Best Method of Marketing Cheese," and requested Mr. Casswell to open the discussion.

Mr. Casswell—Last year we had this pretty well discussed, and we came to the conclusion that it would be better to market our cheese earlier than we did. One, and the principal, reason assigned was that our American cousins—to whom we go for all good things and then improve on them—made a practice of marketing earlier than we were accustomed to doing, and I accounted for the fact that up to that time Canadian cheese had not compared very well with American cheese, by

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stating that the latter was not kept on hand during the hot weather until it began to show its imperfections. Last year we sent our cheese to market earlier, and we have found the good results of it. We have adopted in the west the plan of holding a market every two weeks, alternately, at Ingersoll and at Stratford, and there is no doubt that farmers have got the best prices this year they ever received in the country. It is a great mistake to hold cheese back, and I do not know of any better plan for marketing it than by having these public fairs. If you get away the summer stock early, there is more room left for the fall stock. By keeping it back you are actually throwing your fall cheese into the market to compete against your own summer cheese, whereas you control the prices to a certain extent by sending it forward early. I would advocate the holding of fortnightly fairs—I believe oftener would be detrimental—and then the sending of the cheese forward as soon as possible.

Mr. Burrell said that in the letters which he had received from his London correspondent, Canadian cheese was cited as quite as good as that from the United States. He called the attention of the Convention to the fact that the United States had exported last year 300,000 or 400,000 more cheese than on any previous year, and although Canadians had last year exported 20,000,000 pounds, still American and Canadian cheese were bringing more in the London and Liverpool markets to-day than they had done for a long time. English cheese, as they were all aware, had had the preference in the English market until within the past two years, but now they were getting 78 shillings in London for Canadian and States cheese, and the best Cheshire cheese was bringing little more. With regard to the marketing of cheese, their opinion on the other side was, that to hold a weekly cheese market as they did at Little Falls, was as good as to hold a Convention. Cheese-makers, who attended them, compared notes, and if they found their neighbors were manufacturing better cheese than they were, they ascertained the reason, and tried to improve. Another very important reason for marketing their cheese every week was, that in their climate, during the months of June,

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July and August, if the cheese was made as it should be, it would ripen in thirty or forty days. If they allowed it longer time than this to ripen, they did so at the expense of quality. They had increased home consumption in New York State simply by giving their cheese to the public when it was thirty or forty days old. If they took into account the cost of keeping the cheese back, including the loss on it by shrinkage, they would find that it amounted to about five or six per cent.

Mr. Watkins said that he quite agreed with the previous speakers as to the advisability of shipping earlier than had been the custom in Canada, except last year. He believed that cheese shipped to England, when 30 days old, was in a much better condition when it arrived there, than if it were kept longer; and would command a higher price. There was a vast difference between English and American cheese as to the time of curing. American cheese was just about as ripe at thirty days old as English cheese at five months, and it was to be recollected, that cheese, shipped from this country to England, was curing when on the way, and was, therefore, well cured, when it reached its destination. He thought, from all he could learn, that the County of Hastings would realize as much this year from cheese as any county in Canada, and simply because the manufacturers in it had shipped early. He had spent the greater portion of his life in England, and been connected with the cheese business for about twenty years before coming to Canada, and he had always found that the best dairies in the old country were sold at the farm houses, parties who wanted them going to the homes and paying high prices for the cheese. There were fairs held in England every month, and the general impression seemed to be that cheese was bought lower at them than at the farm houses. He never bought cheese by sample. He thought it desirable that all buyers should visit the factories; he found that manufacturers invariably wanted this, so that if they were not making cheese just as it should be made, they might ascertain wherein they were wrong.

Mr. Casswell remarked that there was one thing the Convention had lost sight of; that was, home consumption. He

had been told by American cheese-makers that since they had paid more attention to the quality of the cheese they produced for home consumption, the use of the article in the country had increased greatly. The American taste was becoming so educated as to require a finer cheese than they were previously satisfied with. It had been his experience that Saturday night's cheese was kept generally for the Canadian trade; while, if manufacturers would sell some of their best cheese to the local dealers, home consumption would increase.

Mr. Watkins said that he hoped no one would suppose he was speaking against markets for cheese. What he wished was that when a maker went to market, he did not take samples of cheese only, but all the cheese or butter he had to sell. He thought the time was hardly arrived for that in this country yet, but it was coming. Manufacturers sometimes brought five or ten cheese into the Ingersoll market now. Buyers were accustomed to go round among the factories, between fairs, and examine the stocks, but generally those having cheese to sell would not dispose of it except at the fairs. A considerable quantity of the cheese produced in that district had been shipped on consignment, and the May cheese which he shipped for a great many factories around there, realized 66 and 67 shillings, netting the factors 16 and 16½ cents.

The hour for adjournment (noon) having arrived, the matter was laid on the table, and the Convention dispersed until 1.30 p. m.

AFTERNOON SESSION.

The Convention was called to order at 2.15, and Professor L. B. Arnold, of Rochester, N. Y., proceeded to deliver an Address, which will be found elsewhere in this work.

Prof. Arnold, in answer to an enquiry, said he had given a good deal of attention to the cause of tainted milk, and his observations had been very satisfactory in regard to its origin. It was a result of the fermentation which was always going on in the milk. When he spoke of fermentation he meant the changes which were produced by the influence of organic germs

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in changing sugar into acid, and then that acid into alcohol, or the sugar directly into alcohol. These changes were caused by a fungus, which was just like what produced the blue mould in bread, and which multiplied very rapidly in connection with sugar. After the sugar became alcohol it turned into vinegar, and finally developed into blue mould. There was a fungus in milk, and in the blood of the cow, always breeding and producing a change. The animal odor of milk was an animal oil that was formed from the albumen in the milk, and escaped at a certain temperature. When a cow was in good health, the formation of this oil was slow; increase her circulation, raise the temperature of her blood in any way, produce an excited action in her system, and its formation went on rapidly; and whenever the change occurred, a taint was the result.

A Member asked if the cream which rose on milk at night could not be made into cheese?

Prof. Arnold said that that depended on the manner in which it was worked. If the cream was put into the strainer before the morning's milk, and well washed through by the latter, and the milk was then stirred up well when the rennet was put in, and only a very few minutes was allowed for coagulation, the cream would be thoroughly mixed with the milk, and could be used. In reply to other questions he stated that hard curds required the least salt, and that a taint could be got off milk by heating it to above 60° . In cooling milk to keep through the night, the worst thing that could be done when it was liable to taint was to reduce it to 60° , because this kept the volatile oil in it. If milk was liable to sour he would cool it down to 50° .

Hon. Mr. Reesor—How long does it usually keep at 70° ?

Prof. Arnold—It will keep 24 hours if the milk vessels are clean.

Mr. Reesor—Have you observed any difference between the quality of cheese made from cows which have pastured on limestone land and that of cheese made from the milk of cows which have grazed on land in which there was more granite?

Prof. Arnold—I do not think there is any noticeable difference.

A Member—I would ask if good cheese could be made up on Saturday night, immediately after the milk is brought in, especially if the weather is very hot?

Prof. Arnold—If I had my way I would heat the milk up to about 138, or, perhaps, 188, using a small amount of rennet. I would then get a pretty strong acid upon it, cool it thoroughly and salt it pretty well. In that way you can get a very good cheese from it, but if you make it up at a low temperature, the animal odor remains, and the cheese will not be as good. After beating it up I would cool it down to the usual temperature before setting it.

In reply to an enquiry from Mr. Casswell,

Prof. Arnold said, that in some localities it would be advisable to skim the milk. If the milk was tainted, it would be better to take the cream off it, because taint settled chiefly in the cream. But if the cheese was naturally hard, and a good texture could not be given to it, skimming was the worst thing that could be done. As a rule it would be better to take the cream off the milk they had on hand and put it into the milk which was brought in from patrons than to take the cream off milk to be used in making cheese.

A Member—How long will it take to make the Saturday night's cheese, heating the milk in the way you mention?

Prof. Arnold—Under that process you would heat it as quickly as at any other time.

Mr. Bensley—What is your opinion about keeping Saturday night's milk until Monday?

Prof. Arnold—There is no difficulty if you have plenty of cold water.

On motion of Mr. E. Fralick, seconded by Mr. Henry Ostrom, a vote of thanks was tendered to Prof. Arnold for his address.

FINANCE.

The Finance Committee reported as follows:—

To the President and Members of the Dairymen's Association of Ontario :

GENTLEMEN,—Your Committee on Finance beg to report that, so far as at present can be ascertained, the receipts for fees will amount to upwards of \$250, and would recommend that the Treasurer pay the Secretary and late Treasurer's expenses attending this Convention, as well as other expenses connected therewith, and make a full financial report at a future meeting of the Directors of the Association.

P. R. DALY, Chairman.

Belleville, Feb. 12, 1874.

The report was received and adopted.

QUESTION DRAWER.

The questions which had been deposited in this drawer during the sittings of the Convention were then taken out and answered as follows:—

Question.—Can as good results be gained in the quantity and quality of cheese if the milk is only hauled to the factory once a day.

Mr. A. B. Ross—I have come to the conclusion that the milk is received at our factory in a much better condition in the morning than if it was brought twice a day.

Prof. Arnold said that he had had experience in having milk delivered once a day at his factory, and he had never had any difficulty in getting it in good order. He had a patron once who brought his milk about five miles once a day, and his was the best milk he (Prof. Arnold) got. In many factories the whey was allowed to slop about the floor and run through, and there was consequently a bad smell about the place, which had a very injurious effect on the cheese.

Question.—Will some person give his experience with regard to cement floors laid on pavement?

Mr. Ashley said that he believed he was the first to make a cement floor in this country, but it was not laid on stone pavement. There were sleepers put down with a coarse board floor

on them, and then he made a grout composed of lime and sand, and covered the floor with this to the depth of a few inches. He put on the grout to prevent the cement from cracking if the lumber in the floor shrunk. He then purchased a number of barrels of cement, which he found preferable to water lime, and covered the floor with it to the depth of about half an inch, and inside of two days he could walk over the floor, while in the course of a week he was manufacturing cheese in it. The floor cracked a little on account of not having had time enough to dry, but it was far preferable to any other kind of floor. No whey soaked into it, and consequently there was no stench.

Question.—At what degree of temperature during the period of heating the curd and whey do the actions of the rennet and lactic acid become the same, or have a uniform power of development?

Prof. Arnold—This is a point on which no scientific observations have yet been made. It was not suspected that there was any difference in their actions until brought out in the practice of cheese-making.

Question.—What is the best method of dealing with milk which is becoming sour?

Mr. Frederick—When I discover that milk is in any way sharp, I hurry it. I add, I dare say, three times the usual quantity of rennet, and hurry the heating, and I always have good success. I take it out as soon as I get the heat up, even if the curd is ever so sloppy and soft.

Question.—What is the reason that it is better for cows not to be changed from one pasture to another?

Mr. Willard said that one reason cows did better by being kept in one pasture was that when they got into a new one they were apt to over-feed, and this produced ill health. They also became uneasy and tried to break out, and the result is they do not give as much milk as when they are restive.

Question.—Can there not be a more durable cheese box made—one that will stand the journey to England? There are very many made that will not last two days, and a great loss is at times sustained in consequence?

Mr. Burrell said that in New York State they had attempted to make cheese boxes of paper, but they were a failure. They now made them of the best elm, and with two lids, by means of which the pressing in and breakage of the bottoms was obviated. He had heard of no complaints when these were used. His cheese always went in them all right.

Question.—What description of a building would you recommend for the manufacture of the milk of 300 cows?

Mr. Brower said that he was manager of a factory with about that number of cows. The building was about 25 feet by 50 feet, and two stories in height. The manufacturing room which occupied the whole upper storey was divided into two parts, and the curing room was on the ground floor. A basement would no doubt be better for a curing room. There were two ventilators on the building which secured a free circulation of fresh air throughout.

Question.—What is the best way of salting rennets, and of soaking them at the time of using, so as to get the most from them and keep them from souring?

Mr. Abraham Horton said that the calf should never be killed when its stomach is full, but always when it is hungry. If the calf was killed when its stomach is full, there would be a great deal of curd, and the rennet would be thin and washy, whereas if the calf was killed when it is hungry, the rennet would be good and thick. The rennet should never be washed. There should be some salt put in it, and then it should be hung up to dry. He had never found rennet sour when it had been treated in this way. He had got very good rennet from calves from four days to a week old, but if a calf were killed when only two or three days old, the rennet would be a very poor one.

Question.—Will the gang press and hoops do all that is recommended of them? What are the advantages of the gang press over the old press, and what progress has been made in substituting the former for the latter, in New York State?

Mr. Burrell said the gang press was considered a success in

New York State. Presses of this description were now made to press twelve cheeses each, and they found that just the same pressure was applied to every cheese—something that was of decided importance. If a new factory was being erected it would be best to put a gang press into it, for it was just as cheap to manufacture with it as with the old press. The latter had so many screws to be attended to, that by the use of the gang press instead of it, the labor of one man would be saved.

Question.—What ingredient enters into floating curd which renders its specific gravity less than that of sinking curd?

Hon. Mr. Reesor said that he thought that the cause of curd floating was the gas in it.

Question.—Can as much cheese be made from 100 pounds of milk by the Cheddar as by the American process?

Hon. Mr. Reesor said that he would perhaps require an hour or two to explain the Cheddar process, but any one who wished to make Cheddar could easily procure one of Mr. Willard's old lectures in which he would find a full description of the mode of doing so. He (Mr. Reesor) believed that there was very little if any difference between the quantity of cheese that could be made from a certain quantity of milk by the Cheddar process, and that which could be made from the same quantity of milk by the American process.

Question.—Are not the horizontal curd knife and Alguire's milk agitator decided improvements in the cheese factory?

Mr. Frederick—I have used both Alguire's agitator and the horizontal curd knife, and I would not do without the horizontal knife if a man was to give me \$50 a year for not using it.

Question.—What kind of salt is the best, and where can it be obtained?

Mr. Frederick said he thought the Onondaga salt was better in some respects than the Goderich, but he had used the latter, and found it very satisfactory; it could be got at any grocery store.

Prof. Bell remarked that he had made an examination of the Goderich salt comparatively with the Salena brand, and

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Question.—What is the best method of disposing of the whey at factories?

Mr. Ashley said that he found feeding it to pigs very profitable, but from what he had learned, he believed more would be made from it if what could be skimmed from it was manufactured into butter. Last fall he made some butter in this way, and persons who had eaten it had not been able to distinguish any difference between it and ordinary butter.

Question.—Which is best, to soak rennets in, water or whey?

Mr. Frederick said that he preferred whey.

There were several other questions in the drawer, but as they related to matters which had been discussed during the Convention, so as virtually to have been answered before they were read, or had reference to something which was of merely personal interest, they were passed.

Mr. Martin Collett asked Professor Bell to give a test for proving, comparatively, the qualities of the several annattos.

Prof. Bell said he was not prepared to give it now, but would endeavor to do so next year.

On motion, Mr. Yates then left the chair, and the Hon. Robt. Reed took it.

Mr. James Brown, M. P., then proposed a vote of thanks to Mr. Yates for his conduct as Chairman during the Convention, and in doing so remarked on the presence of a number of American gentlemen, and said that there was no branch of industry which had done more to promote friendly intercourse between our people and our neighbors to the south of us than cheese-making. He might say that the large amount of cheese shipped from Belleville during the past year showed that this section of the Province was keeping up with the times.

Mr. Weld, editor of the *Farmer's Advocate*, London, Ont., said that he had great pleasure in seconding the motion. He had come a long distance to attend this convention, and he thought he might, perhaps, have had a little influence in bring-

ing it to Belleville. When Mr. Graham, the delegate from this section, attended a convention at Ingersoll, he (Mr. Weld) aided him to the best of his ability to bring the association here, and he had since been endeavoring as much as lay in his power to unite both the eastern and western portions of the Province in this interest. He was afraid that there was some idea of separation, but he believed they had better continue as they were.

The motion was then put and carried, and the Convention dissolved.



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ANNUAL ADDRESS,

DELIVERED BEFORE THE

Dairymen's Association of Ontario,

AT

BELLEVILLE, ONTARIO,

FEBRUARY 11th, 1874,

BY

PROFESSOR BELL, M. A.,

Of Albert University, Belleville, Ont.

Mr. President, and Members of the Dairymen's Association of Ontario :

When, two years ago, I was honored for the first time with an invitation to deliver an Address before a Dairymen's Convention, the cheese-factory system of this district was in its infancy. The number of factories then in operation might almost have been counted on the fingers, for, although there were twenty-three factories entered in the Registry Office of the County of Hastings, one of these had suspended operations after the first season, and several of those on the register had not commenced work, but were making ready for the next spring.

Since that time the movement has thriven and expanded, until, at the close of the past season, there were over thirty factories running, four more are announced as ready to commence in the ensuing spring, and several more are in agitation, which will likely be ready at the same time, so that it is no exaggeration to say that in 1874 there will be at least forty factories at work making cheese in the County of Hastings alone. Besides these, there are several factories in the Counties of Prince Ed-

ward, Northumberland, Lennox, Addington, Frontenac and others, and round Brockville there is quite an assemblage of cheese factories. Add to these the number of factories in the Western division of the Province, which may be called the nursing mother and head quarters of the dairy interest of Canada, and we may fairly assume that during the present year fully 200 factories will be in operation on this side of the St. Lawrence.

The quantity of cheese shipped from the Belleville station of the Grand Trunk Railway alone, amounts to the large number of 58,714 boxes, containing a net weight of 3,935,112 lbs., which, at the average price of $11\frac{3}{4}$ cents per lb, represents a value of \$442,760 coming to the farmers of this district for the year's make of cheese. Of this total quantity, Hastings County supplies 50,378 boxes, weighing net 3,425,221 lbs.; Lennox contributed 5,337 boxes weighing 314,516 lbs.; Prince Edward, 1,086 boxes, weighing 66,867 lbs.; Northumberland, 1,873 boxes, weight 128,608 lbs. The money value of the Hastings cheese is \$385,337, so that the farmers of the County who have entered into the cheese movement have received at the rate of \$10.50 for each and every day of the past year, Sundays included. Now add to this the value of all the cheese shipped at all the stations of the Great Western and Grand Trunk Railways from Sarnia to Cornwall, and thence to Quebec, which cannot be less than four times that sum, and we have \$5,000 a day, or \$1,825,000 a year coming to the farmers and cheese-makers of Canada, from this single article of produce; and this, be it remembered, over and above the value of the whey and other adjuncts, and of the cheese sold to the retail dealers for home consumption. When we take these figures into consideration, we begin to realize what vast proportions the dairy movement is assuming in this country, and of what immense importance it is about to become to the agricultural prosperity of the Dominion.

It may be remarked, too, that its introduction came providentially, as it were, to compensate a great and progressive falling off in the supply of what had previously been two of the great staples of our country, timber and grain. As the margin of the forest receded before the advance of settlement, the timber, which had long been the most important of our exports, became more and more difficult of access, and, therefore, more costly to procure; while the abolition of the differential duties by the British Parliament materially reduced its value in the market. At the same time the exhaustion of the soil of the old settled districts by continuous cropping with wheat, and the de-

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nudation of the country from the wholesale and injudicious destruction of trees, rendering the fields subject to alternate droughts and deluges of rain, with their usual concomitants of vegetable parasites and insect pests, rust, smut, midge, fly, weevil, and other similar plagues, blighted the prospects of our farmers, and reduced many of them to the verge of ruin, when the adoption of dairy husbandry, and the introduction of the factory system of cheese-making, shewed them not only a prospect of escape from present difficulties, but also a cheering vista of future prosperity, which is rapidly becoming a palpable and agreeable reality.

But here it may be asked: Will this prosperous state of the cheese business be permanent? Is it capable of such extension as to be a lasting and general benefit to the agricultural section of our community? Or is there not a danger of production being so increased that the supply shall exceed the demand, so as to glut the market, and cause the price to fall below a remunerative figure? I think not, at least, not for an indefinite period of time. The capacity of the English market is stated to be 800,000,000 lbs. of cheese per year, *i. e.* 26 lbs. a year, or one-half pound a week, per head of the population. Even allowing largely for exaggeration in this statement, it is plain that the cheese-producing capability of Canada will not be equal to overstock such a market for generations yet to come. In this connection I shall read a portion of a business circular from Mr. John Corderoy & Son, a prominent English house in the trade:

LONDON, Jan. 1, 1874.

"The year 1873 has been marked by a very large importation of American cheese to this country. The arrivals from the 1st of January to the 31st of December were 1,736,495 boxes, while, during the year 1872, there were 1,228,184 boxes, showing an increase for the year 1873 of 508,311 boxes. But with all this additional supply, the stocks in London and Liverpool are not excessive. The consumption has been promoted by prices having been throughout the chief part of the year on a moderate scale, the best qualities being so much cheaper than cheese of a similar character produced in this country. It may also be remarked that in our manufacturing districts employment has been general and wages good, which may partly account for the large demand for American cheese. The quantity of cheese made in this country in the past year is considered to be less than in the year 1872; the difference, probably, is not great on the whole, but is most decidedly marked in Cheshire. Prices, especially for the superior descriptions, have ruled high;

in some instances, considerably exceeding those of 1872. With regard to the quality and character of cheese in general, we do not think any material advance has been shown in comparison with former years. It may be stated that in some respects Canada has improved in her manufacture, and some of her factory dairies are nearly equal to the finest of the States. * * * We venture on no prediction as to the future, but there is no doubt that the demand for cheese will be in a great degree governed by the quality, the consumers being prepared to pay fair prices if they can only secure excellence in exchange. In this market, buyers are, as a rule, more careful than ever in their selection, as regards quality, color, flavor, firmness and soundness of condition. Soft, damaged, or inferior cheeses, are less saleable, even at reduced prices, than they were a few years ago."

I also copy the following from one of our local journals:—"From Scotch papers of recent date we are pleased to learn that Canadian cheese is not only attracting some attention, but beginning to occupy a high position in the markets of Great Britain. This was particularly noticeable at the great annual cheese fair held lately in the West of Scotland. The number of entries was unusually large, upwards of thirteen hundred of the most celebrated dairies of Scotland and England being represented. The judges were selected from the most experienced cheese manufacturers of the kingdom. Thus, the Canadian specimens of cheese were placed alongside of the very finest cheese produced in the world, and were tested by those who were most capable of forming an opinion as to their merits. It is interesting, therefore, to notice the remarks of Mr. Copeman, of the firm of Yeats, Acocks & Copeman, of London, who, with the concurrence of the other judges, expressed himself as follows:—"The general quality of the cheese shown was as good as he ever saw. As a stranger to the district, coming here quite unprepared to see such fine cheese, he thought there was the nucleus of this becoming the finest cheese-producing district in the United Kingdom, because it was well-known that the making of cheese in a number of dairies was decreasing every year. There was some Canadian cheese which was as finely flavored as any shown." As we have already said, the other judges concurred in this opinion. It must be extremely gratifying to cheese manufacturers in this country to learn that in the production of an article of such extensive domestic use, they can not only compete with their neighbors across the line, but also with the most famous makers of Britain, whose reputation was

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world-wide before Canadian makers had turned their attention to this branch of agricultural industry."

Such testimonies as these, which I could easily multiply to a very large extent, ought to be sufficiently reassuring to those persons who have entertained the doubts which naturally prompt them to ask the questions I have suggested, for they establish beyond peradventure the three conditions of success. 1st—That there is no danger of over-production; for the supply of American and Canadian cheese, amounting in 1873 to 1 $\frac{3}{4}$ million of boxes, or 100 millions of pounds, is only one one-eighth of the estimated capacity of the British market. 2nd—That the quality of the Canadian cheese is well adapted to the taste of the British consumer, and consequently our cheese is rapidly acquiring a reputation which must bring it more and more into request. 3rd—That from our natural advantages, and the excellence of our system of manufacture and transport, we can undersell the British cheese-maker in his own market, and if the anticipation to which Hon. Mr. Willard gave expression at the Ingersoll convention last year, shall prove correct, and the consumption of cheese in the United States shall increase to such an extent as to absorb the whole product of the American dairies, it is clear that the Canadian manufacturers must enjoy for a long series of years a virtual monopoly of the English trade.

I would say, then, to the farmers of Canada, who have not joined the dairy movement, and particularly to those of them who may be still dubious as to the prudence of embarking their means in the business, lay aside your doubts and fears, and hesitate no longer to add your mite to swell the amount of what is evidently destined, for generations yet to come, to form one of the chief and most remunerative agricultural staples of this Dominion.

But the money value of the products of our factories is not the only advantage that ought to recommend the system to the favorable consideration of the Canadian farmer. It is a fact not more widely known than deeply deplored, that much of the land in this country is so far exhausted by having been made to bear a succession of crops of wheat, wheat, wheat, that its productiveness has fallen below the remunerative point, and the owners must, therefore, either find some means of restoring its fertility, or must leave their holdings, and endeavor to find a locality where the freshness of a virgin soil may enable them to repeat, for a few years, the ruinous course which had deteriorated the soil and destroyed the productive power of their fields, and forced them to break the ties of consanguinity and the asso-

ciations of neighborhood, and driven them into the wilderness to wring from the bosom of unsophisticated nature, the sustenance which their worn out acres could no longer afford them. But as the more accessible parts of our country are already well settled up, new and eligible farms being not to be had within the bounds of the older provinces, and many of those who have gone to try their fortune upon "the boundless prairies of the fertile west," as our southern neighbors delight to call that vast expanse of rock, swamp, and desert, with a few fertile tracts interspersed, which stretches from the Mississippi bottoms to the Rocky Mountains, have seen cause to repent the easy credulity that caused them to believe the glowing descriptions of land speculators, and the interested representations of railway companies, whose only hope of profit lies in the sale of their land grants, and have come back to us, fully satisfied to prefer the half-cake of Canada to the no-bread of Kansas, Colorado, or Nevada; and as the vast extent of fertile territory which has lately come into the possession of the Dominion seems likely to remain for an indefinite, and possibly a protracted period, practically inaccessible for the purposes of colonization and settlement, it has become of vital consequence to the farming community to discover a means by which the productive power of their fields may be restored, without incurring the certain expense, and awaiting the uncertain effect of artificial fertilizers; and by which themselves and their families may be maintained in their wonted comfort, while the work of refertilization and recuperation is going on.

Now, such an agency is evidently afforded by dairy husbandry. It is well-known that laying down partially exhausted land in grass is a sure, though slow way to restore a great part of its fertility. The grasses which cover its surface, to the exclusion of almost all other plants, return to the soil much more than they take from it. The nitrogen, carbon, and other substances which they absorb from the atmospheric air, and the atmospheric water, are converted by the mysterious agency of the vital forces into the solid state, and constitute most of the substance of the vegetable organism. When the plant dies and goes to decay, part of these substances flies off in a gaseous form, but by far the larger portion remains to mingle with the soil, and form the food of future crops.

If, however, instead of being allowed to lie down and decompose on the spot where it grew, this grass is cut down, and carried into the barn, or pastured in the field by cattle, and is thus converted into flesh and milk, a certain portion of the fer-

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tilizing elements is abstracted from the soil. 1000 lb of milk contain about 6 lb of mineral matter, nearly one half of which is phosphate of lime, and the remainder consists of potash and soda, in combination with chlorine, and a little magnesia and iron, all of which are drawn from the soil, and cannot be replaced from the atmosphere, as most of the carbonaceous and nitrogenous matter is. It is clear then that a long continuance of such an abstraction will ultimately deprive the soil of those substances, when either the quantity or quality of the milk, or both, will be seriously diminished or deteriorated. The flavor of butter and cheese, too, is believed to be owing to the presence of certain essential oils or ethers, which are developed by the action of the phosphoric and sulphuric acids; in their absence the product becomes flat and insipid, or coarse and rancid. A deterioration of this kind has become manifest of late years in some of the principal dairy counties of England, in Somersetshire, Gloucestershire, and notably in Cheshire, where the production of cheese has very much fallen off, both in quantity and quality. That this degeneration is owing to the cause I have described, is sufficiently evidenced by the fact that a marked improvement has arisen from the application to the pastures of a top-dressing of ground bones, and still more from the use in the same manner of superphosphate of lime, or bones treated, and wholly or partly dissolved, in dilute sulphuric acid, which supplies most of the missing ingredients.

It is true that these are not the only, or even the most abundant, substances which milk abstracts from the soil. It also contains a considerable quantity of carbon, hydrogen, nitrogen, sulphur and oxygen, which in their various combinations with each other, and the before mentioned ingredients, go to form the butter; the caseine, and the albumen which constitute the valuable parts of the milk; but these substances are for the most part either restored to the land in the manure of the barnyard, or absorbed from the atmosphere by the plants during the period of their growth, so that the husbandman is not required to supply them so frequently or in such large quantities as in the mineral ingredients of milk and flesh.

The great advantages of dairy farming as an enriching process for poor or exhausted land lies in the greater quantity of manure afforded by the increased number of cattle necessary for the production of milk. These demand for their support the greater part of the produce of the farm, which is thus consumed on the spot, and those parts of its bulk which are not necessary for the nourishment of the animal, and are consequently rejected

by its digestive organs, are returned to the soil, instead of being carried away, and lost to it forever; and though they are simply replaced in the soil from which they were originally taken, and thus cannot be said to increase the actual amount of plant food in the soil, yet they are restored to it in such a form as to be immediately or proximately available for assimilation by the growing plants, and therefore vastly increase the productive power of the land to which they are applied, without altering the ultimate proportion of its ingredients.

A great diversity of opinion exists among practical farmers, as to whether it is more beneficial to apply the manure to grass land in a raw or recent state, or after it is well rotted. I am inclined to think that the weight both of reason and experience favors the use of well-made manure; and it is certain that liquid manure is far before both in immediate effect; but in whatever state or form it is applied, it will be found necessary to supplement it with a small quantity of superphosphate of lime and common salt, along with a little natural or good artificial guano, where preferable; observing that the manure should be applied at a time when rain may be expected, and that cattle should not be turned in upon the land where it has been laid on until after the grass has been well washed down by a shower.

To obtain the full benefit of dairy farming as a restorer of fertility, the farmer ought not to rely solely upon the increased quantity of barnyard manure that it furnishes; he ought also to pay great attention to its quality. The only valuable part of such, or indeed of any other manure, is that part of its substance which is soluble in water at the ordinary temperature of the atmosphere. Vegetables cannot digest solid food as animals do. They have no mouth to masticate gobbets of flesh or bunches of grass, and no stomach to receive and macerate solid substances. They require that their food shall be presented to them in a state of complete solution, so that it may be able to pass through the minute pores through which alone they can take in their nutriment. It is essential therefore to the proper treatment of manure that it be made under cover. If it is left exposed to the action of the sun and rain for the weeks or months required for its proper fermentation, part of the valuable matter will fly off in a gaseous or vapory form, and the remainder will be dissolved out by the rain or melting snow, and carried down into the narrow area into which it lies, as is witnessed by the rank vegetation which skirts the manure heap as far as its drainage runs, or which springs up on the spot where it had lain.

The urine of the animals, I must also state, is much more

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valuable than the solid excrements, as in it are carried off nearly all the excess of potassa, soda and soluble phosphates, nitrates and sulphates which are not required for the production of milk, or the sustenance of the animal. The drainage of the barns, then, should not be allowed to run to waste, or contaminate the nearest stream or pond, from which perhaps the farm animals have to drink, but should be received in tanks, from which it could be pumped out from time to time, and either diluted with water, and applied in a liquid state, or composted with swamp muck, road scrapings, ashes, fresh or leached, charcoal dust, plaster, or any available material, and added to the solid manure heap. I would here observe that this is no fanciful or thoretical view of the matter, but a plain statement of the result of experience which has enabled the British farmer, in the absence of protective duties, and in defiance of the competition of the world, to pay an annual rent for his farm, which, in many cases, would purchase the fee simple of an equal number of acres of equal quality in some of the fairest districts of Canada.

Here I must enter my earnest protest, on behalf of the cow, and of those who are destined to use her products, against the barbarous and unwholesome idea of allowing the manure to be made in a cellar underneath the barn, which, I am sorry to say, I have seen very lately advocated in an agricultural publication by some one who ought to have known better. If I were a cow I should not like to belong to that writer, and if I were a farmer I should as soon allow it to be made in the cellar underneath my dwelling-house. In the process of fermentation, or incipient decomposition, it gives off a quantity of gaseous emanations, composed of sulphurated, carburetted and phosphoretted hydrogen gas, and ammoniacal vapors. These emanations possess an irritating quality, which tends to excite inflammatory action in the mucus membrane which lines the nostrils, larynx, trachea and bronchial tubes of animals which are exposed to its influence for any length of time. When an animal thus predisposed is brought to breathe cold air, it is apt to be taken with what in the human subject is commonly called "a cold"—catarrh—or perhaps the fatal pleuro-pneumonia, congestion of the lungs, tubercular disease, or some other disorder of the respiratory organs. Now, as the wholesomeness of the milk depends upon the healthfulness of the cow, too much care cannot be taken to preserve her in a sound and healthy condition. To this end the barn should be so constructed as to afford complete and warm shelter, and at the same time to admit of ready ventilation. It should have sufficient elevation to insure perfect drainage, and

the solid manure ought to be removed at least once—better twice—every twenty-four hours. In the spring, soon after the cattle are turned out into the fields, the whole interior and the outside of the walls should be lime-washed, which would neutralize any noxious deposits, and destroy any insect pests or parasites which might have found shelter in the chinks and crannies; and it would be no disadvantage if the process were repeated in the Fall, as to the interior, before being re-occupied. The dairy farmer who understands his own interest will pay particular attention to the physical comfort and well-being of his cattle. In the grazing season he will see that their pastures are provided with shelter from storms, and shade from excessive heat. A good expedient for this purpose is the erection of a frame of poles or scantling, closed on three sides with boards, or wattle-work of pine or cedar branches, and in either case having the roof covered with the latter. The rays of the sun beating upon a roof of boards soon heats it through, and instead of affording a cool, refreshing shade, the interior acquires the heat of an oven. This increase of temperature a covering of branches will prevent. He will also take care that his cattle have access to pure and wholesome water, and if his fields are not provided with a natural supply, he will remedy the defect by conducting a stream from some more favored locality, or by sinking a well and placing it in a convenient situation. In winter he will see that they have a really weather-tight and warm habitation, and not merely a huge ghostly building, full of holes and chinks, through which every cold blast whistles as through the branches of a leafless tree, and chills the poor animals to the bone. He will also supply them with a sufficient quantity of nourishing food to maintain them in health and good condition, allowing them in very cold weather a modicum of a more generous diet, to enable them to resist its depressing influence, and when the spring returns, they will make him an ample compensation for his kindly care of them during the winter. This advice applies equally to the case of the young cows he may raise to fill the places of those which may be worn out, or lost from disease or accident. An animal which is starved with hunger and cold in calf-hood will never make a good cow, and it will be found that in the latter as well as in the former case, good treatment and good feeding will pay best in the end. Connected with this aspect of my subject there is another consideration of such vital importance to all concerned, whether as producers or consumers, that I must bespeak your undivided attention to what I have to say concerning it; and that is the relation of dairy products to

the general health, of the elements with microscopical investigation formerly breaks as Power, against maintained to our fields toes; in planted to introduce The observation have corn typhoid fever, disease, a fever and tape-work reception stomach ness are lar manner air we br presence, so serious the due p forms of to deadly gree to th composed functions are affected ficial con This to be pec products enter so care ought the water And yet l caution n or partial

the general health, and the influence of milk as an agent of health, or a disseminator of disease. Since the recent improvements which have been introduced into the construction of the microscope have rendered that instrument available for the investigation of the causes of sickness, many diseases which were formerly accounted so mysterious in their sudden and fatal outbreaks as to be ascribed to the direct interposition of Almighty Power, and accepted as the manifestation of God's judgment against nations, or individuals, for their sins, have been ascertained to owe their origin to the same cause which makes our fields to glow with grain, or their ridges to swell with potatoes; in fact, that as the seed must be sown, or the cutting planted to produce our crops, so the germ of disease must be introduced into the system before the disease can be developed. The observation of naturalists, and the experience of physicians, have corroborated each other in arriving at the conclusion that typhoid fever and Asiatic cholera, and other forms of epidemic disease, are disseminated among our species by the presence of fever and cholera germs in the water we drink; that trichina, tape-worm, and other sporadic diseases, are occasioned by the reception of animals of low organization, or their ova, into the stomach along with the food we eat, while other forms of sickness are produced by vegetable spores or seeds taken in a similar manner, or inhaled into the throat and lungs along with the air we breathe. There they increase and multiply, until their presence, and the irritation caused by their movements, disturb so seriously the mechanism of our bodies, as to interfere with the due performance of the vital functions, and induce various forms of disease, varying in intensity from slight indisposition to deadly sickness. These conclusions apply in an equal degree to the case of our domesticated animals, whose organs are composed of the same material as our own, and perform similar functions, with but slight variation, and whose bodily systems are affected in much the same manner as our own, by the artificial conditions under which their lives, like our own, are spent.

This is especially true of the cow, whose constitution seems to be peculiarly sensitive to influences alluded to; and as the products of that animal, in the shape of milk, butter and cheese, enter so largely into our daily consumption of food, extreme care ought to be taken to ensure that the food, and especially the water, supplied to the cow, be of the greatest possible purity. And yet how often do we see this prudent and necessary precaution neglected. In too many instances any sour, mouldy, or partially decomposed food is deemed good enough for the

cow, and often the only water to which she has access is that of some ditch or pond contaminated with the drainage-water of houses, barns, cattle-sheds and manure heaps. The cows of this town appear to be peculiarly unfortunate in their owners. I lived nearly fifty years in the old country before I came to Canada, I have travelled over considerable portions of England and Scotland, and part of the United States, but I never saw cows reduced to eat horse-dung, till I saw it, where it may be seen every day at the present time, and that is on the streets of Belleville. Milk seems indeed to be peculiarly liable to become the vehicle of these disease-engendering organisms. I dare say some of my hearers remember the account that was given, at the former convention, of the researches of Professor Low, of Cornell University, on a case of poisoning by cheese, in which he traced the germs from the water in which they first appeared, through the milk of the cows which drank it, into the cheese in which they seemed to develop and concentrate the malignity of their venom. Since that time several cases of disease, arising from the use of infected milk, have been recorded, from among which I select the following, taken from the *Berwick-upon-Tweed Advertiser*, of January 10, 1873 :—

“**TYPHOID FEVER CAUSED BY GERM-POISONED MILK.**—A virulent outbreak of typhoid fever, in several streets near the Leeds Town Hall, a few weeks ago attracted the attention of the authorities. The epidemic, very fatal in its character, pursued a somewhat eccentric course. It attacked families in some parts of fashionable squares and left others untouched. It raged in certain middle-class streets and passed over others. Though it was found that the drainage in some parts of the affected district was slightly defective, this did not satisfactorily account for the attack. The authorities next turned their attention to the food supply of the infected houses, and they then discovered that one milk dealer, living in the centre of the town, supplied the whole of the infected houses, and it transpired that he received his daily quantity from a farm near Harewood. Thither the health officers of the town at once proceeded, and found that some six persons were there suffering from the fever. The milk cans were generally kept in the kitchen, which closely adjoined the room where the fever patients were laid, and one woman attended to both the sick inmates and the dairy. The theory is that the germs of disease in the air settled down in the milk cans before they were daily sent out with their stock of lacteal fluid. The Sanitary Committee of the Leeds Town Council at once stopped the sale of milk from this infected

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quarter. To show the severity of the epidemic, it may be stated that some eighty people were thus secretly attacked, and twelve of the patients have since succumbed to the virulent disease."

The persistent vitality of these germs is indeed astonishing. Freeze them up in a solid mass of ice at a temperature of 70° below zero, and as soon as they are thawed out, they will be as lively as ever. Plunge them into boiling water, and they will appear to enjoy the agreeable warmth of their bath. Parch them to dryness, like the sands of Sahara, and as soon as they come in contact with moisture they will be ready again to fulfil the function of increasing and multiplying. When they once become established in a situation or a substance which favors their growth, it is all but impossible to eradicate them without destroying the tissues in which they revel. The only way to avoid their ravages is to prevent them from getting a footing; and to effect this the utmost attainable cleanliness must be observed, not only in the utensils in which the milk is received from the cow, and carried to the factory, but also in the body of the animal, and the person and clothes of all those through whose hands it passes; and above all every care must be taken and every precaution exercised, to prevent the milk from being exposed to the contact of any injurious vapors or infected miasmata, or emanations, from putrid substances or diseased bodies.

I have now said nearly all I intend to say upon the subject of cheese; but there is another article of dairy produce which is worthy to occupy the attention of this Convention for a few minutes, and that is butter. According to the articles of their constitution, our factories are instituted for the manufacture of cheese and butter; but I have yet to hear of the first pound of butter having been made in any of those factories. Yet the demand for good butter is even greater than that for cheese. The butter trade of Canada is now in much the same state as that of cheese was before the introduction of the factory system. Butter is made in this district in small quantities, and of all qualities, except really good butter, which is very scarce. Such of it as is exported enjoys anything else than a favorable reputation. If any one wants to know the reason why, let him go to Belleville market any Saturday when there is a fair attendance, and he will find that every farmer's wife who brings her butter to market has a different quality, and some of them two or three qualities in the same basket. The fact is that very few of them know or observe the conditions necessary to ensure good butter. They know just enough to put the cream into the churn, turn the handle, or work the dash, till the butter forms,

take it out, give it a wash, put in the salt, make it up into rolls, and put it into a basket. The dealer who comes here to buy butter has to take all these qualities to make up his quantity, and when he packs it, his tubs will be like Joseph's coat—of many colors—and will neither be pleasing to the eye, nor satisfactory to the trier. That this state of things requires amendment few will be disposed to deny; that it can be amended may be inferred from comparing the standing of Irish butter in the English market at the present time, with its character, 60 years ago. At that time the greater part of the packed or tub butter imported from Ireland was considered only fit to mix with tar to "lay" sheep with, or to grease cart wheels, and it was extensively bought for those purposes; now, Irish butter ranks in the English market next to the best Kiel or Holstein make. What then is the reason of this great improvement in the quality and character of Irish butter? It is simply because the small holdings into which the area of the country was formerly divided have been aggregated into large farms, the operations on which are directed by skill and intelligence, aided by capital, and instead of being made into confined hoods, by ignorant, careless, slovenly, and incompetent persons, the butter is now made in large quantities, in convenient dairies, and by experienced dairy maids, whose improved methods have been copied by their neighbors, and whose example has caused a general improvement in the make of butter over the country.

Now, if the factory system were applied here to the making of butter, as it has been applied to the making of cheese, I have no doubt that the result would be equally satisfactory as to the quality of the article, the profits of the business, and the reputation of the product in the market; for if a really good article is sent for sale to England, John Bull soon finds it out.

For my part, I do not see any reason why a good deal of butter might not be made in our present factories. They work upon cheese at most during only one-half of the year, and at a trifling expense, might be fitted to work upon butter, during a considerable part of the remaining half. In the opinion of many dealers, winter-made butter is preferable to summer-made butter for packing, as it keeps better. Butter is composed mainly of two sorts of fatty matter, margarine and stearine, the former being of a soft or oily, the latter of a hard or tallowy consistence. Winter-made butter consists chiefly of stearine, while in the summer-made article the margarine predominates, and as that substance is more liable to turn rancid than the stearine, summer butter does not keep so well as that which is made in win-

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ter. It has been objected that in very severe weather the milk would freeze on its road to the factory, but if the milk waggon were furnished with a tilt cover, and a small stove, as I see an enterprising market gardener has for bringing his vegetables into town, and if the milk cans were kept within the shelter of the barn or kitchen till called for, that difficulty would be obviated.

There is another source of profit which is realized in the dairies of England, but is wholly ignored in our factories, and that is the making of butter from the whey. The curd does not take up the whole of the butter vesicles from the milk. If the whey is allowed to stand for a few hours, a cream will rise from which butter may be made similar to that made from cream or milk, only that the caseine is almost entirely removed. This butter, though not equal to milk butter in flavor and texture, is yet stated to be far from disagreeable in taste, and to be very superior to lard for frying, shortening and other domestic and culinary purposes. It brings about three fourths of the price of ordinary butter.

The author of a valuable little book, entitled "A Handbook of Dairy Farming," published by Messrs. Longmans & Co., London, England, in discussing the most profitable use of milk, gives the preference to the making of butter and skim-milk cheese conjointly, the profit of which he states at £16 sterling, or \$80 per cow, for the season. He states the return from the same quantity of milk made into cheese at £14 or \$70 per cow. In corroboration of this statement he gives the total produce of fifteen dairy farms in Gloucestershire, milking 439 cows, for one year, as follows:

64 cwt.=	179,648 lbs. of cheese,	£4812 os. od.,	or \$24,060 00
	5,269 " milk butter,	263 8 0	" 1,316 00
	11,420 " whey butter,	428 5 0	" 2,141 00
	1,756 " scores bacon,	878 0 0	" 4,390 00
		£6,558 13 0	\$32,907 00

Giving an average of £14,18s.,od., or nearly \$75 per cow.

In discussing the matter of introducing the making of milk butter and whey butter into the factories with one of our prominent dairymen, he advanced two objections; one was that if you took the butter from the whey you would not be able to raise any pork. A reference to the statistics I have quoted from Mr. Morton's book disposes conclusively of that objection; for he shows that the same dairies which made 11,000 lbs. of

whey butter in a season, produced during the same time 35,000 lbs. of bacon, equal to 50,000 lbs. of fresh pork. Indeed, the abstraction of the butter scarcely diminishes the feeding qualities of the whey, for the nutriment the hogs derive from it chiefly consists of the albumen, of which it is not deprived either in the manufacture of butter or of cheese.

His other objection was that the introduction of butter-making would necessitate the employment of a large additional amount of labor, and a corresponding increase of expenditure. This objection might be obviated by calling in the aid of machinery. If the factories are not large enough to demand a steam-engine, a horse-power might be employed, or a wind-mill, such for instance as the one introduced by our enterprising townsman, Mr. W. C. Nunn, erected in a convenient position, say on the roof of the factory, would give all the power requisite, and as it is perfectly self-regulating, it would need no attention, except to oil the bearings now and then, and to throw it in or out of gear, as required.

With respect to the making of skim-milk cheese, we are informed, through the newspapers, that Mr. Blanding, of Broome County, in the State of New York, exhibited at the New York Central Fair some samples of skim-milk cheese, which was pronounced by experts who tried it with the iron to be of prime quality, and equally saleable with good whole-milk cheese, in any market. Mr. Blanding informed the reporter that he had no difficulty in marketing his cheese, customers often preferring it to whole-milk cheese, at an equal rate per lb.

I trust that these suggestions may not be thrown away, but that some of our dairy managers will try the experiment of introducing the making of butter, and especially of whey-butter into their factories, as I am convinced it would add materially to the profits of the patrons. For their encouragement I would mention the fact, that so largely does the demand for butter exceed the supply, that a company has been established in the City of New York, with a capital of half a million of dollars, for making butter from tallow, by a patent process. It is affirmed that the discoverer has succeeded in producing a substance which, when flavored with essential oils extracted from certain seeds, can scarcely be distinguished from the genuine product of the cow.

It is certainly very much to be desired in addition to what I have recommended, that some public spirited person or persons would establish a butter factory in this neighborhood. I am convinced that it only needs a trial to be successful. The

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ideas of our farmers run very much in grooves. They are not very ready to take up a new idea, until it has been thoroughly tested and proved to be sound; but I am convinced that butter-making on the factory system needs only a beginning to be proved as profitable, and to become as favorite a pursuit as cheese-making, on the same system, is at the present time.

I shall now proceed to place upon record a succinct account of the rise and progress of the co-operative system of dairy husbandry in this section of Canada. In the year 1865, the Government of the United States, in consequence of a misunderstanding with the British Government, gave notice that in the following year they would terminate the agreement for reciprocal trade in certain commodities, which had existed for some time between their country and Canada. This announcement caused considerable agitation among our farmers, who apprehended, not without some show of reason, that this proceeding on the part of our neighbors would act injuriously upon their interests by depriving them of a market for a large portion of their produce. In this emergency the Hon. Robert Read took into serious consideration the practicability of finding something which might at once alleviate any injurious effects that might ensue from the abolition of the reciprocity treaty, and relieve the minds of our farmers from the depressing influence of the apprehensions with which they naturally regarded the prospective situation.

Having on a previous visit to the United States seen the operation of the cheese factories, and justly appreciated the important bearing of such institutions upon the condition and prospects of the agricultural section of the community, to so great a degree, that on his return he had made a standing offer of a bonus of \$100 to any person or company who should establish a cheese factory on the American plan in the County of Hastings, he concluded that the introduction of that system was more likely than anything else he could think of to effect the end proposed.

He next consulted with Mr. K. Graham, then as now, the representative of the West Riding of Hastings in the Legislature of Ontario, and the result of their conference was that Mr. Graham, in company with Mr. Read, Jr., took an extended tour through the dairying district of the State of New York, in the course of which they made themselves thoroughly acquainted with the constitution of the dairy companies there existing, and with the working of their factories.

On the return of these gentlemen, Mr. Read, Sr., and Mr.

Graham, resolved to essay the establishment of a model factory on the American plan, with such modifications as might better adapt it to the circumstances of this country. They therefore procured a suitable building, purchased the necessary apparatus and utensils, engaged a skilful manipulator from the States to conduct the manufacture, themselves provided one-half of the number of cows necessary to supply the requisite quantity of milk, Mr. Read furnishing 50 and Mr. Graham 40 cows, and the Front of Sidney cheese factory went into operation in the year 1866, and from that time to the present has been a continued success.

The example thus set was quickly followed. The farmers became aware of the beneficial effect of co-operation, and cheese factories sprang up in all directions, all of which, with the exception of one, which, from a defective constitution, suspended operations after the first season, are now working successfully; and the movement is still spreading. Four new factories have been recently registered to commence operations in the spring, and I hear of several others which are making preparations to go into business at the same time. The co-operative or joint stock principle seems to be preferred by our farmers; though the proprietary factories established by Mr. Harford Ashley have been eminently successful, and it is to be hoped that that gentleman will reap a suitable reward for the ability and energy with which he has conducted his operations.

One of the most notable events in the annals of the Canadian dairy movement for the past year is the consolidation of the associations of the eastern and western sections of the Province under the same executive management. The dairymen of the western section, about the year 1868, formed themselves into a society to promote the interest and extend the knowledge of their profession, under the name of the Canadian Dairymen's Association, and obtained a grant of money from the Ontario Government to aid their endeavor. They held their Annual Conventions in the Town of Ingersoll. The cheese-makers of the eastern section, in 1872, formed themselves into a similar association, under the name of the Ontario Dairymen's Association, established their head-quarters in the Town of Belleville, and applied for a similar grant. The Hon. Minister of Agriculture and Public Works, however, being unwilling to subsidize two rival associations, suggested that the two bodies should coalesce and form a Provincial Association, which should hold its Conventions alternately at Ingersoll and Belleville. An amalgamation was accordingly effected at the convention held

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at Ingersoll last year upon terms which were agreed to by both parties. There is to be one Dairymen's Association, which is to be called "The Dairymen's Association of Ontario." The Annual Convention is to be held twice at Ingersoll, and once at Belleville, and the Government grant to be assigned accordingly; and finally, the Directorate is to comprise representatives of both sections of the Province, giving the majority to the western section. Let us hope that the dairymen of both sections will work harmoniously together under their new constitution, and that they will sink sectional differences in a common endeavor for the benefit of the whole.

I had the privilege of being present at that convention, and though the usual winter covering overspread the face of nature at the time of my visit, yet it could not hide from an observant eye the superior capability of the country for general cultivation, and particularly for dairy farming; and I found that the farmers were aware of the advantages it offered, and prepared to make the most of them; and that not only they, but the townspeople also evinced a degree of interest in the proceedings of the Convention, and in the subject of cheese manufacture generally, which fully accounted for the great success of the dairy movement in that quarter, at the same time showing that such success was well deserved. I most sincerely wish and hope that the public, and especially the merchants of Belleville, who so largely depend upon the agricultural section of the community for their success in business, will show a similar interest in the proceedings of this and subsequent conventions, and by their presence and attention at once obtain a considerable amount of valuable information, and encourage those who are engaged in the work to still greater efforts to render it beneficial to themselves and the public at large.

A very important and highly pleasing feature of the subject is indeed presented by these periodical conventions, in which all persons interested in the dairy business—both those who are engaged in it as a matter of commercial adventure, those who are employed in directing or performing the process of the manufacture, and those who make the physiological and economical relations of the various materials and products the subject of their study and observation—meet together to interchange opinions, make enquiries, relate experiences, suggest improvements, and generally to give and receive mutual information, and thus promote the successful prosecution of their common interest. But there is another class besides those I have mentioned whose active co-operation it is highly desirable

to secure. I mean the large and important class of consumers. With respect to this class, the *New York Times*, in its comments upon the proceedings of the Convention of the American Dairymen's Association at Utica, advances the following shrewd, practicable and sensible views :—

"We consider it to be an unfortunate circumstance that at this and other similar conventions held elsewhere, the consuming class is not represented. A representative of this vastly greater body of citizens than the producers themselves should by all means be invited to ventilate their side of the question. Their views upon the question are certainly worth knowing, for as they are more closely studied and more nearly met, so will their demands increase, and the business of supplying their demands become enlarged in extent and profit. Unfortunately, as we have suggested, this great army of consumers is unrepresented and unheard, and the producers labor under the disadvantage of not knowing exactly the wants of their customers. And because their consumers' wants are not fully or exactly supplied, the consumption of their products is lessened and the market value thereof is reduced. That this is certainly the case the dairymen may be very well assured. In fact the needs of a large class of consumers are entirely unsupplied. This class consists of persons of refined taste, but of moderate means. House-keepers of this class are forced to consume butter of very poor quality, or avoid its use altogether, and to a great extent its use is avoided. These persons rarely or never use cheese upon their tables, for the reason that they have no variety to choose from, and the shape in which cheese comes to market is not desirable for their uses. This is but one class concerned, but it consists of those who in the aggregate consume the largest portion of the dairy products brought to market in the large cities and more considerable towns. It would, therefore, be wise in the producers to consult the tastes of this large class. What they desire is not only excellence and stability of quality, but that their butter should come to them in more convenient packages than it now does; and equally that they shall have cheese of a greater variety both in quality, size, and form."

A few sentences further on, the *Times* proceeds thus :—

"So far as regards cheese, the vast improvement that has been made during the past few years has brought that manufacture up to a level only with a very narrow demand. The present consumption of cheese may easily be increased tenfold. But this will not occur until the popular demand for variety has been supplied. No one style of make, however good it may be,

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answers all purposes. The English people have their dozen or more varieties of native make, and import in addition American, Swiss, French, Dutch, Italian and German cheese. The French people have nearly fifty varieties of native cheese, besides importing many foreign varieties. The Italians make at least five varieties, and the Swiss as many. We are confined to but one kind of native cheese, although that kind is distinguished by the undesirable possession of many varieties in quality. We have certainly good, bad and indifferent cheese, but in other respects we cannot claim much variety. We need not only variety in flavor, but also in shape and size. We need a native Stilton, an Edam, a Wiltshire, and a small loaf Cheddar, as also some of the very small cream or milk cheeses which may be eaten fresh. Cylindrical cheeses of six to twelve pounds weight, of a sufficiently good quality to sell up to thirty cents a pound, would undoubtedly become popular, as would also ordinary cheese of equal size at an equivalent advance of price. We would take this opportunity of calling the attention of dairymen to these suggestions on behalf of the great body of consumers who are waiting the advent of the needed improvement, as well as on behalf of themselves and their own interests, which are very seriously involved in this matter."

I would commend these remarks, which are evidently those of one who thoroughly understands and appreciates his subject, to the careful consideration of the directors and managers of our companies; and would have them to reflect whether it would not be advantageous to make some cheeses of various weights, shapes, qualities and flavors, especially for home consumption. It used to be accepted as a maxim in politico-economic philosophy that the demand must precede the supply, but modern experience shows that in the great majority of instances, the supply creates the demand.

I have upon the present occasion refrained from entering upon the discussion of the scientific department of the subject. The other gentlemen who are to address you, have made these matters the subject of long and earnest study and examination, and whose opportunities and facilities have been so much superior to my own in the way of acquiring experience and information, will, no doubt, make you acquainted with the latest discoveries and improvements which have been made, introduced, or suggested, in the theory and practice of the dairy. And I do not need to exhort the operators in the several factories to use their best endeavors to maintain, or, if possible, to improve the quality of their products. The spirit of emulation and al-

most of rivalry which exists among them is a sufficient stimulus to their exertions in that direction, and they need no words of mine to excite their zeal, or to increase their ardour.

It only remains for me now to say a few words to the farmers and the farmers' wives who supply the milk that forms the basis of the manufacture. Upon you depends the ultimate measure of success which Canadian cheese may achieve in its competition with the produce of the world in the markets of Britain. If you send to the factories good, healthy, rich milk, the operators will be able to make rich, well-flavored, wholesome cheese. But if any of you, with a view of obtaining a little surreptitious profit, send skimmed or watered milk, keep back the strippings, or allow the milk of diseased or unhealthy animals to mingle with the rest, that person endangers at once the reputation of the factory and of the country, and the health, and perhaps the life, of the consumers. It would certainly be a proud satisfaction to be able to say, "Our factory makes as good cheese as any in the country," and prouder yet to say, "Our country produces as good cheese as any in the world!" and by the cordial co-operation of all concerned, we may at no distant day be able to speak those words without boasting.

Let, then, the reputation of Canadian cheese be as dear to you as the reputation of a mother, a wife, or a sister; and show the people at home that Britons and their descendants have not degenerated in their distant homes—even in the matter of cheese-making—from the British pluck, British energy and perseverance, and sterling British honesty and integrity, which have made our race the foremost of mankind.

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AN ADDRESS,

DELIVERED BEFORE THE DAIRYMEN'S ASSOCIATION OF ONTARIO,

Wednesday Evening, Feb. 11, 1874,

BY

X. A. WILLARD, M. A.,

PRESIDENT OF THE NEW YORK STATE DAIRYMEN'S ASSOCIATION
AND BOARD OF TRADE.

THE PRODUCTION OF MILK AND SOME OF ITS CHARACTERISTICS.

MR. PRESIDENT, LADIES AND GENTLEMEN :—I am much gratified to meet this large and intelligent audience here this evening, and I assure you I appreciate the honor you do me in calling me so many times to speak before this Association. I need not say that I esteem it fortunate to have so retained your confidence that you still are willing to give me a hearing, for I should regret to lose your good opinion, since I like Canada and her people, many of whom I number among my warmest friends.

During the last ten years there has been great activity of mind in the direction of dairy manufacture. A most remarkable spirit of enquiry and investigation has been awakened among the cheese and butter makers of America—in handling milk and in manufacturing dairy goods—a spirit which is beyond parallel in any former age of the world. What mean these large assemblies of men gathered in convention throughout various parts of the States and in this Dominion? Why is it that no other branch of industry can call together such large bodies of people year after year, keeping up discussions for days without loss of interest, but on the contrary, entering with en-

thusiasm upon the duties of the occasion? It means simply that dairy manufacturers have emerged from the old slough that has for ages held down the agriculturists, as a class; it means that they have learned a better way of doing those things pertaining to their calling than was practiced by their fathers; it means that we are not content to follow blindly a set of rules without knowing the reason for their adoption.

In the United States it is admitted that our dairy conventions are doing more for progressive agriculture than the whole mass of farmers following other branches or specialties. They have given an impetus to agricultural thought which is beginning to be felt throughout the whole length and breadth of our land, compelling respect and lifting agriculture into the rank of the learned professions. Men eminent for their acquirements, lawyers, doctors, clergymen, professors in colleges, men engaged in trade, in manufacture, and in manifold callings, are now attentive listeners at our conventions, and they go away amazed at the amount of knowledge gained on questions concerning which they confess to have been previously profoundly ignorant.

Another feature, growing out of our conventions, of great importance to the welfare of the people, is the gradual moulding of the public taste to a higher appreciation of agricultural pursuits. Men of learning are now entering the field and are giving their best energies in the investigation of difficult problems, which have long been a source of doubt to the practical farmer. But while the cheese and butter makers of the country have made great progress in knowledge, the milk producers—the men who furnish the raw material—have not made proportionate advancement. They have not so generally attended the conventions, and they have complained, with perhaps some show of reason, that the topics of discussion have been too much devoted to the mere art of manufacturing milk rather than its production. Within the past two or three years dairy farmers are expressing more desire for information than formerly, and they are more willing to accept advice, and enter upon improved practice. This is one of the hopeful signs of the age; and I have thought it not inappropriate at this time to discuss some questions concerning the production of milk. The great difficulty in the way of success with those following dairy husbandry, as well as in other pursuits, is the lack of knowledge and application of principles. The man who has learned the greatest number of facts or principles connected with his business and can group them together properly in his practice, will—other things being equal—be the most successful.

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Let us take for instance a simple illustration in the matter of fuel. It is a settled fact that a cord of dry wood, maple, or beech, or oak, will give out more heat for practical purposes, and spend farther than a cord of green wood, and yet we find a very large number of farmers who will continue to waste their labor and their money, to say nothing of discomfort, in using green wood from year to year. If a quarter of the fuel is lost in driving off surplus moisture, which the sun and air will do without cost, a knowledge of this fact—if followed in practice—is worth a certain amount of money, which, in a series of years, amounts to a large sum.

There are a great many things in dairy practice as simple as this, which men do not find out, or overlook, in their system of economies, and it is the cause, not unfrequently, of their failure of the highest success.

PRODUCTION OF MILK.

One of the most important questions to be considered at this stage of dairy progress is, in my opinion, the production of milk, and its proper condition for manufacture. It is impossible to advance farther in the production of fine dairy goods, unless an improvement be made in the raw material which comes to the hand of the manufacturer. And there are some things which I think have become sufficiently established to entitle them to the rank of general principles.

The greatest fault in our dairy conventions, it seems to me, has been the omission to strike a direct blow at the fountain-head, to lay bare existing evils at the farm, and seek to bring about a reformation in the practices of dairymen, many of whom appear totally unconscious and blind to acts little less than criminal in their results.

The *New York Times* of January 16, 1874, in an account of the fearful ravages of Typhus fever at Richmond, in the vicinity of Philadelphia, says:—"The prevalence of this disease is chiefly attributed by the physicians to the use of swill-milk, which is produced and vended in the neighborhood. The production of this unwholesome milk is very large in Richmond. Numerous swill dairies have been visited, and the cows have been found to be in a fearfully diseased state. The large proportion of the deaths are those of infants who have generally been feed upon milk of this impure kind. One hundred and thirty one infants have died during the past week. The fever now prevailing is of the most virulent type.

Although the attention of the city authorities has been called to the traffic in this diseased milk, no action has

ever been taken by them. The misery and disease are not confined to the districts here mentioned, but extend in a milder degree to all parts of the city."

Is not this crime? Is not this murder? Murder, dark premeditated, and most fiendish in its character?

Prof. G. T. Brown, chief inspector in the veterinary department of the Privy Council, Professor of Physiology and Therapeutics in the Royal Veterinary College, London, has shown in his recent report how contagious and infectious diseases are presumed to be communicated by means of certain germs in which the contagious property resides, and the fact is proved beyond question, that the milk of cows affected only in a slight degree with certain ailments, have caused disease and death to animals, and to the persons partaking of such milk.

Again fevers have been known to be transmitted to healthy persons from using the milk of healthy cows, when the milking has been done by the nurses of sick persons, or by the servants and attendants on the family when the specific fevers are prevailing. Diseases of a virulent character have also been traced to the impure water used in cleansing dairy utensils, the germs in this way entering the milk, reproducing themselves, and thus conveying the poison to persons partaking of it.

These are facts proved beyond question by scientific investigation of undoubted authority. Is it not time that we bring these matters squarely before dairymen? Is it not time that we point out the responsibility which lies at the door of every dairyman who sends into market—whether in milk, or butter, or cheese—this poison of unhealthy animals, the milk of diseased cows, or that of those suffering from broken udders, from sore feet, or from any affection when pus is likely to form on any part of the animal? Is it not right that we ask that such milk be rigidly excluded from that which is to go into use for human consumption?

These evils are found among the dairymen of the United States; they are found among dairymen abroad, and will any one pretend to say that Canada is entirely exempt from them.

Recent investigation in regard to the subtle poison now so frequently found in cheese point to pus or diseased matter coming from the udder or teats of cows and entering the milk, and from thence carrying poison to the cheese, by inducing its own peculiar fermentation as the cause.

A very common disease among cattle, and one not much noticed, is Scrofula. It can frequently be detected by the existence of tumors in various parts of the bodies of cattle, but

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they show a greater preference to form about the throat and sides of the face than elsewhere. These tumors, especially such as are hard or modulated to the feel, and only slightly painful, cannot be completely dispersed, says Prof. Simonds, by any kind of treatment, but after a time they often yield to a degenerating process and discharge a pusulent like fluid, from sinuses which are formed within them.

Farmers should be careful, not only as a duty they owe to the public, but as a matter of economy to themselves, to weed out of their herds all weak or sickly disposed cows, and no milker should be suffered to draw milk from a cow without first washing his hands thoroughly in soap and water, and especially in families where sickness of any kind is prevailing.

Canada cheese is gaining a reputation in the markets of Europe, and from what I can learn, it has come in a great measure from increased attention to cleanliness at factories, and a better knowledge of some of the causes which affect the character of milk. I know this, that some of our most noted factories have risen from bad to good under the same maker, simply by a reformation among patrons in the production and preparation of the milk for manufacture. In the production of milk I think there are some points that may now be laid down as facts. That good grass is the most natural food for milch cows, and therefore produces the best milk. That the sweetest and best grass is produced on up-lands or well drained soils, and that pastures should be on such grounds rather than on low, swampy or wet lands. That it is more conducive to health and thrift of cows to pasture in one field, rather than in changing from week to week to different fields. That cows should have salt constantly within reach, because nature is a better regulator of the quantity the animal economy requires than man, and because experience shows that better results, both as to health and milk, is obtained by allowing cattle to regulate this matter for themselves.

A requisite far too generally overlooked in the management of dairy farms is the proper provision of good clean water for the stock. Nothing has been more clearly settled in dairy practice than this—that it is an utter impossibility to make good milk from bad water, and yet hundreds of dairymen pay no attention to the matter whatever. Slough holes, stagnant filthy pools, alive with organisms of the most pernicious character to health, putrid pools, the waters of which, if regularly employed for human consumption, would entail ague and fevers, and other diseases, and soon break down the strongest constitu-

tion, are often the only sources from which cattle can slake their thirst. And yet such water is considered good enough for the manufacture of milk.

We have a law in the States, and you have a law here in Canada, punishing with fine and imprisonment the person convicted of watering milk; but there is no law against him who openly poisons his milk from day to day, and from week to week, by compelling his cows to slake their thirst from filthy pools. In a moral point of view, I ask you which of the two crimes is the most heinous?

I notice on the programme for discussion at this meeting a subject of some importance, "The Cause and Prevention of Floating Curds." Now I had begun to think that perhaps I was putting this water question rather too strongly. I thought perhaps some of my friends in the Dominion might feel that I had no business to come here and talk in this way, because some one might infer that I had intended my remarks to be applicable to Canadian Dairymen. But I assure you I did not mean to be personal, I was not thinking wholly of Canada farms, but rather of the large number of New York farms where this evil prevails. But when I saw that question on your programme it occurred to me that it had not been set down there simply as a conundrum; and it put me in mind of a certain noted Republican in Wisconsin, who, in travelling, fell in with a Democrat. The two soon became great friends, and they began to imbibe pretty freely, and then to swear pretty freely, and after getting in all the whiskey they could carry, they became exceedingly intimate and loving towards each other, and the Democrat grasping his new friend's hand, told him he was a glorious (hic) old fellow, and that he knew exactly (hic) to what political stripe he belonged, and that no one could mistake him for anything but a *true blue democrat*. The Republican straightening himself up with difficulty replied, "Now, see here Mister, I own that I have all the *symptoms*, but I haven't got the disease. Now that question in your programme struck me that you had the symptoms of imperfect milk bad in Canada, and I am almost inclined to believe that you have the disease also; for there is no more prolific source of floating curds than in compelling cows to drink during hot weather from putrid stagnant pools. I have seen a great many cases of the kind both at farm dairies and at factories, and I have seen the trouble removed and brought on alternately by a change of water. There may be other causes, of course, but when I see the *symptoms* of a floating curd, I feel pretty certain the *disease* can be traced to bog holes, filthy water,

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or some nastiness on the farm of some patron, or to some abuse of the herds, racing them to and from pasture by dogs or otherwise.

Good sweet running water should always be provided in abundance for milch cows, and it should be in convenient places where stock will not be required to travel long distances to slake their thirst. If springs and running streams cannot be had in pastures, a good well, with windmill and pump, make an efficient substitute, and the waste water may, if necessary, be conducted back into the well, so as to keep up a constant supply of good fresh water.

What every factory ought to do is to have a printed circular for every patron, in which are certain questions to be answered, as follows: Do your cows feed in swamps and on boggy lands? Have you good sweet running water convenient for stock, and is it abundant and permanent in hot, dry weather? Have you shade trees in your pasture, or do you think that cows make better milk while lying down to rest in discomfort in the hot, broiling sun? Do you use dogs and stones to hurry up the cows from pasture at milking time, thus over-heating their blood and bruising their udders? Do you cleanse the udders of cows before milking by washing their teats with their own milk, and practice further economy by allowing the droppings to go into the milk pail? Do you enjoin upon your milkers to wash their hands thoroughly before sitting down to milk, or do you think that uncleanness in this respect is not important for milk that goes to a factory? When a cow makes a mis-step while being milked, do you allow your milkers to kick her with heavy boots, or to pound her over the back and sides with a heavy stool, accompanied by sundry profane remarks addressed to the cow to teach her better manners? Do you cool and aerate your milk at the farm, or don't you believe in such things? Would you use a cooling and aerating apparatus, if so simple as to cause you no trouble except in cleaning, if such apparatus were furnished you free of cost?

These and similar questions should be given to patrons, and the answer obtained in writing over their signatures. It is well to know what farmers believe and what they do not believe.

But in addition I am in favor of Gail Borden's plan of sending a competent person to look over every patron's premises at least once a month, or oftener, and report the condition. Then, when bad milk comes to the factory and is detected, you know where to lay the trouble, and inaugurate a reformation.

Three years ago I was asked by the Ohio State Dairymen's

Association to give the annual address before that body, and they said they wanted a *practical* address. Well, I went to Ohio and told them some of the evils existing in New York, thinking perhaps they might apply to Ohio, and they *did* apply, and so snugly too, that the Ohio manufacturers clubbed together and printed 3000 copies of the address to distribute among their patrons. I have the assurance of some of the best manufacturers in Ohio, that that address has done an immense amount of good, and that the cheese product of the State has been vastly improved by the reformation which has been effected in some of the evil practices of farmers.

PASTURES.

I have a word to say about pastures. Old pastures, where the turf is thickly set with grass, showing no intervening spaces, will, as is well-known, give better results in milk than recently re-seeded grounds. The reason is because in such pasture there is a greater variety of grasses, many of them indigenous to the soil, which spring up in succession, thus affording a nutritious bite from week to week during the season.

Old pastures, clear of weeds, and where the herbage is thick, should not be broken up. But the best pastures often become weedy, and the grasses run out, so that little feed is obtained. In such cases perhaps the better way is to plow, re-seed, and get down to grass again as soon as possible. Great injury is not unfrequently done to lands intended for grass by taking off a succession of grain crops, thereby leaving it in a state of exhaustion, and it takes a long time to recuperate when laid down to grass.

Pasture and meadow lands require a different order of seeds. In pastures the seed should be in great variety, sown in greater abundance, and an effort made to get an herbage similar to old grass lands. June grass, orchard grass, spear or wire grass, (*Poa compressa* of the botanists) meadow foxtail, the florin grasses, white clover and other varieties should be sown. I have seen the very best results from this course, and an acre made to yield more food than four or five acres before plowing and re-seeding.

CHANGING THE COMPOSITION OF MILK.

The general impression among farmers is that the composition of milk can be greatly changed by feed. That is to say, if a cow, for instance, in fair condition, and on abundant rations of grass, gives poor milk—milk deficient in butter—her milk can be improved in this respect, by feeding corn meal, or any of the rich oily foods.

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The experiments of Professors Kuhn and Bossingault go to show that this idea is a fallacy. Extra feed may and does increase the quantity of milk, but the relative constituents or solid matters remain in about the same proportion. The quality—that is the richness of milk—must be sought for in particular animals or breeds, and not in special feeding. Of course, it must be understood that cows are to have sufficient food of a nutritious character to keep them in good condition, as a starting point, for if this is wanting, the animal draws on the resources of her own flesh and fat to supply the elements of milk, and hence, as these become exhausted, the milk may be very poor. The experiments of Kuhn and Bossingault were made with a considerable number of cows, and with a great variety of foods from the richest to the poorest, and yet the relative constituents of the milk remained about the same. I have often seen the experiment tried on single cows giving poor thin milk, and by no process of feeding could the milk be made to improve in fat.

Different kinds of food have great influence on the flavor of milk, and some foods are much more efficient than others in keeping up the strength of the cow. What the dairyman should seek, therefore, if these principles are correct, is to give such food as will keep his cows in a good, thrifty, healthy condition, food that will make the largest quantity of milk of the best flavor. But if he seeks very rich milk, he must look to individual cows, or to certain breeds noted for this peculiarity.

MILK GLOBULES.

Dr. Sturtevant, of Massachusetts, has recently made some investigations of interest respecting the fat globules of milk in different breeds. You understand, of course, that the fat or butter of milk is in little sacks suspended in the fluid. These globules vary in size, and some of the sacks of fat are very minute. These butter sacks, by virtue of their less specific gravity, rise to the surface of the fluid, and form a coating known as cream. In churning, we break or rub off the pellicles or sacks enveloping the particles of fat, which thus liberated, are gathered together and constitute the lump of butter.

Now Dr. Sturtevant says, on examining these fat globules under a microscope, they show a certain and definite relation between the quality of the milk and the breed of cows. The breed, he says, determines to a large extent the most economical and advantageous manufacture of cheese. The milk globule of the Jersey breed he finds larger than the corresponding

globule of the Ayrshire and Holstein breeds, and in the Jersey there are fewer globules under a certain size, say 1-27,000 of an inch, and globules of this size he calls for convenience granules.

The milk globule of the Ayrshire breed is smaller than that of the Jersey, and intermediate in size between those of the Jersey and Holstein, and the milk of individual cows of the Ayrshire breed can be grouped in the clauses or grades, according to the size and distribution of the globules. This milk abounds in granules.

The milk globule of the Holstein is the smallest of the three breeds, and the globules are more uniform in size than in the Ayrshire, and there are fewer granules. These globules determine some of the physical character of the milk.

If samples of the Jersey, Ayrshire and Dutch milk are placed in a per cent. glass, under like conditions, it will be noticed that the cream will rise in each sample with different degrees of rapidity, the larger globules on account of their less specific gravity reaching the surface first. Thus, Jersey milk throws up cream in four hours, Ayrshire in ten hours, and Dutch in five hours. In churning the larger the globule the quicker is butter produced, and the more uniform the size of the globule the larger the yield of butter from a given quantity of cream of equal richness by analysis. The globules of a similar size appear to be evenly affected by the process of churning, and break at about the same time.

When the milk of different breeds is mixed, or churned separately, the latter gives butter largely in excess of the former. The explanation is that when a large globuled milk and a small globuled milk are churned together the larger globules separate first into butter, and the breaking of the small globules appear to be retarded. The practical application of this is that you cannot mix Jersey with Ayrshire or Dutch cows without loss, because the larger globules are broken first in churning, and while the smaller globules are being broken, the butter which came first is being over-churned.

For cheese-making the milk which is richest by analysis, and yet throws up the least cream upon standing, is best; and this milk is one of small globules, the smaller the better, even approaching granules in size, yet furnishing abundant fat analysis.

These investigations are novel, and when they shall be extended to the milk of other breeds, they may result in valuable suggestions of a practical character. There are some other in-

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teresting facts brought out in the study of these fat globules in milk.

FUNGUS GERMS.

In the manufacture of cheese we know practically that the poorer the milk the more rennet is required in order to make from it good cheese. The explanation of this is found in the recent investigations of Dr. Bastian in respect to the transformation of milk globules into large fungus germs, which speedily vegetate into a kind of *pencilium*.

When some milk is placed in a small vessel, to the depth of about two inches, the larger milk globules soon begin to collect on the surface of the fluid. After twenty-four hours or more (the milk being protected from dust by an inverted glass) the surface is found to be yellowish and smooth, constituting the most superficial stratum of a layer of cream, the under portions of which are of an opaque white color. When reflected, this is found to lie on the surface of a blueish white whey, containing soft flakes, which, on microscopical examination, are ascertained to be composed of precipitated caseine, in a finely granular condition, mixed with small milk globules and multitudes of active *bacteria*. In this condition it has a sour odor and an acid reaction.

The white stratum of cream immediately above is composed almost wholly of aggregated, and more or less unattended, milk globules, mixed with myriads of *bacteria*. But it is in the superficial yellow stratum, more especially, that the milk globules are found to be more or less altered, and in which some are being metamorphosed into fungus germs. To recognize this satisfactorily, requires great care and patience, and it is only possible, by making an examination of specimens in which the transformation is in its earliest stages.

After even a few hours, owing to the rapid growth and repeated branching of the *pencilium* filaments, the superficial stratum is permeated by them in all directions, and they are mixed up soon afterwards with the large *conidia* which the filaments are constantly throwing off, and which germinate in their turn. This remarkable transformation of milk globules was described by M. Turpin 34 years ago in a paper read before the French Academy of Sciences, but was for the most part disbelieved or unheeded by many, who, as Dr. Bastian remarks, ought to have satisfied themselves, by actual observation of the truth or falsity of what had been recorded. And he adds, that the few who have looked for themselves, have been able in all important respects to confirm M. Turpin's statement.

Dr. Bastian points out the manner in which these investigations should be made, and says, on examination with the microscope from time to time such changes will have occurred in many of the milk globules, that they may be seen to have assumed a less refractive and more vesicular appearance, and to be giving birth to one, two, or even three buds, from their periphery, which speedily grow into large disseminated mycelial fillaments. And the fact that so many corpuscles undergo a similar change beneath the same covering glass—that these changes take place in corpuscles which are so large as to be easily observed—and that all stages may be detected between unaltered milk globules and the large fungus germs into which they are transformed, make these observations absolutely convincing to any one who has once witnessed them. They, therefore, become typical of many other changes which may take place, but in which all the stages of the transformation cannot be so easily watched.

Left to itself the whole surface layer of milk becomes in a short time densely interwoven with fungus fillaments, and multitudes of the *conidia*, which they are constantly throwing off, are sown amongst them. Soon a white mildew may be seen, even with the naked eye, sprouting up from all points of the surface, and after a time it becomes covered with a perfect forest of *penicillium glaucum*.

Again, says Dr. Bastian, the transformation may be much more easily seen in a minute portion of Neufchatel cream cheese. By placing a portion about the size of an ordinary pin's head upon a glass slip, moistening it with distilled water, and spreading it into a thin film, the changes which it undergoes can be easily watched. When kept in this moist, uncovered state, in a damp chamber, in a temperature of 65° Fahrenheit, I have found that at the expiration of 48 hours, nearly one half of the fatty looking mass had actually undergone segmentation into fungus germs, many of which had in their turn grown out into well developed fillaments. It will be seen, therefore, that the fat globules are especially concerned in the transformation or changes which we wish to bring about by the addition of rennet to the milk, and that if a large share of these fat globules are removed from the milk, the designed transformation is weakened, and more of the fermenting liquor or rennet will be required to supply the power lost by abstracting the fatty portions of the milk.

CURING CHEESE.

In my address last winter at Ingersoll, I referred to the

amount of water in a first-class English Cheddar cheese, it being about 34 per cent.—the best American cheese being about 6 per cent.—drier by analysis. It may be remarked here that our standard of excellence in cheese is that of a first-class Cheddar. It has been described by some of the most noted cheese mongers of England, and I may as well repeat the descriptions here, that we may all know what we are talking about. Messrs. Corduroy, of London, say: We want cheese rich, solid, fine-flavored, firm, sound, handsome, and that will continue to improve for twelve months, or longer, if required. Mr. Bates, of Cheshire, says: The best cheeses made are firm and imperishable, keeping, in the farmers cheese room, for twelve months or longer, the texture being solid, but not tough, and the flavor fine. Mr. Titley, of Bath, says: The characteristics of a good cheese are these, mellow and rich in taste and flavor, and firm and full in texture. Mr. Patterson, of Edinburg, affirms: A good cheese is rich without being greasy, with a sweet, nutty flavor, clear, equal color throughout, of a compact solid texture, without being waxy, firm, yet melting easily in the mouth, and leaving no rough flavor on the palate. Mr. Harding, of Marksbury, says: A good cheese is close and firm in texture yet mellow; in character or quality it is rich, with a tendency to melt in the mouth; the flavor, full and fine, approaching that of a hazel-nut.

These are the characteristic points required by the English taste as a standard of excellence. Other nations may have a different standard, and different individuals may have a certain standard, but the great mass of cheese made for export to England must be made to approximate to or cover the points named as far as possible, if the best prices are to be secured; and the nearer we fill the bill, the more is our cheese wanted abroad, and the better are the prices paid for it.

With all our progress in the cheese-making art, and with all our knowledge concerning the nature of milk and its peculiar transformations, I do not think we have surpassed in our manufacture the excellence of first-class English Cheddar. Many of our factories equal it in their September cheese, or with cheese made when the conditions of weather, feed, and other circumstances, are all favorable, but they do not do it in their hot weather cheese; and the fault lies not only in the imperfect manner in which milk is delivered at the factory, but in the curing of cheese upon the shelf.

There is no other way of accounting for the difference in our summer and fall cheese, since the process of manufacture

is conducted on the same principle, and by the same maker. And I wish to say right here, that one of the best things accomplished by the American Dairymen's Association was the inauguration of the European mission.

Previous to 1866 we were in doubt as to what was really required in the English market. We were then making a large cheese from 100 to 150 pounds in weight. It was often porous or open-meated like the Cheshire, the color was variable and the flavor imperfect. It was not strange that our manufacture should be defective, because dealers and shippers were constantly complaining of defects, and recommending in part, processes drawn from the various methods adopted in different sections of England, sometimes the Cheshire, or the Wiltshire, or Gloucestershire, or Linconshire manufacture. It was not till 1864 that any knowledge of the Cheddar process was known in this country. The leading points in the process were given for the first time in my annual address at the first meeting of our Dairymen's Association in 1864-5. I had some time previously obtained an account of this process from England, and having experimented with it in my own dairy, had become satisfied that it was the most rational system of cheese-making that had yet been suggested, and upon this point my subsequent observations in England of different methods farther confirmed me in this opinion. The acid process, which is the distinguished feature in the Cheddar method, was not practiced by American factories previous to 1860. In the first report of the New York Dairymen's Association in 1864, the method of manufacture of quite a number of the best factories is given. No mention is made in these reports of the whey or curds being allowed to sour or take on acid.

The system to-day of the best cheese made in this country is essentially after the Cheddar process, modified somewhat to suit our factory apparatus, and I do not know that we have improved in the main features of that process, though we have learned the reason of many things connected with it which the English did not appear to understand.

It was not till the mission to England in 1866 that we knew exactly what was required in the English markets, and since that time our manufacture has been modeled after the Cheddar plan, even to the shape of the cheese.

After returning from England in 1866, I made some experiments in curing cheese, which satisfied me our July and August cheese could be kept in flavor and cured down mellow and rich, and at the same time be improved in weight. I had arranged

my curing rooms with openings, even with the floor, provided with wickets, and with a ventilator running through the roof, also provided with a wicket. The walls contained an air chamber, and I found that by the use of water at the wickets and on the floor, and by the arrangement of the ventilator, a pretty uniform temperature of 70° to 75° could be maintained in the hottest weather. We were making two cheeses per day of about 35 pounds each, and by keeping a moist atmosphere, so as to prevent the too rapid evaporation or drying out of the cheese, together with the even temperature, a very rich fine flavored product was the result; the cheese also keeping well, some of it being retained until the next season perfect in flavor, and mellow and rich in taste. The saving in weight was about four per cent.

In curing cheese in hot, dry weather, where no regard is had to temperature, there is another trouble besides loss of flavor, induced by undue fermentation, and this is, a too rapid evaporation of moisture, which, if it had been retarded, would have intimately mingled with the other parts, assimilating, so to speak, with the solid constituents, resulting in a mellow texture, and making the cheese appear more rich in butter to the taste than its analysis would indicate. The fact becomes quite plainly demonstrated to any one who has observed the changes going on in the cure of Limburger cheese.

The Limburger cheese is a small cheese of about two or three pounds weight, of a brick like form. If cured in the ordinary way they would soon dry up, and become almost as hard as bricks; but they are placed in a damp cellar, and are set up close together, thereby having their moisture retained during the process of fermentation. And this moisture becomes so assimilated with the other parts that Limburger appears exceedingly rich in butter, and is so plastic that it may be spread with a knife somewhat like butter. At certain stages of the curing Limburger is of a sweet, clean flavor, rich and mellow in texture, resembling Stilton, but the German taste requires that the fermentation be carried on until the odor and taste is very offensive to persons not accustomed to its use. It still, however, is plastic, mellow, and of a rich, buttery appearance, and I am told, by those who have learned to like it, that it is esteemed as one of the greatest of delicacies. I meet gentlemen in New York City who have acquired a liking for Limburger, by testing this cheese from time to time at the instance of their German friends.

The complaint against much of the factory cheese, both at

home and abroad, is that it is *too dry*, and the complaint is well grounded. And, in addition to the loss of apparent richness in such cheese, the actual loss in weight, on account of moisture not retained and assimilated, is from five to six pounds per hundred. I do not doubt but that experiments will be turned in this direction, and that the time is not far distant when we shall have curing rooms constructed so that our hot weather cheese will be vastly improved both in flavor and texture.

RECENT DISCOVERIES.

Of some of the new shifts in dairy goods, the manufacture of butter from beef suet is one. There are now several factories engaged in this business in New England, New York, New Jersey, Maryland and California. Mr. Luther Tucker, who recently visited the factory at Albany, N. Y., says: The suet is first cut up in small pieces, and put into a trough or vat, and covered with water, in order to soak out any blood which may adhere to the suet, and after soaking a considerable time, is carefully and thoroughly washed. It is then run through a hasher, which cuts or grinds it up as finely as possible. It goes next into a large steam vat, when it is melted and again cleansed by straining, as in the ordinary way of preparing lard for domestic use. It is then subjected to immense pressure under a powerful hydraulic press to extract the stearine. It then goes to the churn, in which a sufficient quantity of butter milk or sour milk has been placed. Annatto is now added, and the whole mass is churned in the usual dairy manner an hour, or until the butter has acquired the real butter flavor, which it gets from the thorough exposure of every particle to the action of the real butter-milk. It is then taken out, washed and worked in the usual way, and again worked and salted, as in dairy butter, and finally packed in tubs for consumption. Everything is conducted with perfect cleanliness, and no injurious chemicals are used in any of the processes. I am told that this butter can be made at a profit of 20c. per pound, and that large quantities are sold for the table in cities, and for the use of bakeries. I have examined several specimens of this butter; some of it is granulated and leaves a tallow taste in the mouth, other specimens were more like butter, but inferior to a fine genuine article. There are various speculations concerning the influence which this new article is to have on the butter trade, and another year will doubtless give us definite results. Another dodge said to be practiced with success by certain factories in Oneida Co., N. Y., is to set the milk and take off all the cream that will rise during 24 or 36 hours. This is

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churned and made into a first quality of butter. The skimmed milk is then treated as follows: First, a quantity of rancid or low priced butter is purchased, melted and washed to free it from impurities. Then a certain quantity of the melted oil, in proportion to the quantity of milk, is added to the milk, thoroughly stirred in, and immediately set with rennet. The coagulation catches the oily particles, and by working carefully they are retained, and the cheese is not distinguished from whole milk cheese. At least I am told that no complaint has been made by dealers, or in the market, as to the full quality of the cheese.

TESTING ACIDITY OF CURDS.

In cheese making, as is well known, one of the important requisites is to know just how far to carry the acidifying process. Various methods are resorted to, such as the *feel* of the curd, its odor and general appearance and the spinning of the curd when drawn from contact with a hot iron.

But Mr. Gould, in his recent address before the N. Y. State Dairymen's Association, has suggested that the acidometer, an instrument patented in 1870, would be a valuable aid in experimenting and in reducing this part of the process to more exactness. Of course milk and curds require such various handling under different conditions, that no set rule can be followed. Still it is possible that this instrument may be made of use in determining conditions that cannot otherwise be accurately defined. It will tell with accuracy the different degrees of acidity of any liquid, and is quite simple in its operations.

By adding an alkali to an acid a certain amount of gas is evolved according as the liquid is more or less acid. This gas is made to press upon the water and forces it up the tube, when the proportion may be read off in the graduated scale. 'I have not experimented with the instrument, but propose doing so the coming summer.

PRICES OF BUTTER IN ENGLAND.

You cannot but have observed in looking over the market quotations of the world that the price of butter is gradually advancing, and this is especially the case in England.

The United States ceased exporting the higher fancy grades of butter several years ago, the home market for such being too high to allow of exportation.

Canadian butter, during the last two years, has risen in price in England from 100s. to 136s. the cwt. I do not know whether this is to be attributed to an improved quality in Cana-

dian butter or to the scarcity and consequent increased price in England.

The best continental butter sent to England has been quoted this winter (1874) at 160s. per cwt. This is a high price and it is a question whether Canada can not make it profitable to improve her product and enter her goods in competition.

Butter in the United States is now largely produced in Creameries, and the product has been vastly improved. In Sweeden the American Creamery system has been introduced, and her product in consequence has risen to great excellence, having been quoted in London on a par with best brands.

In my address last winter at Ingersoll, I referred to the experiments of Prof. Danforth, of the Royal Agricultural College of Stockholm, in which he states that a larger quantity of cream can be obtained from a given quantity of milk by cooling it and setting it in water, thereby reducing the temperature of the milk to about 36° Fahr. and keeping it at that point during the creaming process. Under this management, which is now practiced at the Swedish butter factories, nearly all the cream he says rises in twelve hours, and beyond twenty-four hours no advantage is gained in the quantity of cream obtained.

This low temperature in setting milk is so different from all former theories on the subject as to arrest attention, and I hope the butter makers of Canada will look into this question for themselves.

EXPORT, 1873.

An important question bearing on the dairy interests of America is the capacity of England to take our cheese. The exports during 1873 go far to show that all our surplus has been hardly sufficient to supply the English demand, and that no immediate fears need be entertained that our markets are to be clogged with a surplus, or that the average price will fall below that of 1873 for a series of years.

The Messrs. Corduroy, of London, give official statements showing the total amount of American cheese arriving in England from January 1st, to December 31st, 1873. The quantity is put at 1,736,495 boxes. Shippers, in their estimates, usually make the average of boxes at 60 pounds each, and if we estimate on this basis, the American product shipped to England during 1873, amounts to 104,189,700 pounds.

The quantity exported from New York City during the same time was 1,569,570 boxes amounting to 94,174,200 lbs. From eight to ten millions of this went to other countries than Great Britain. This shows that the exportations direct from

Canada to England during the year amounted to about 20,000,000 pounds.

During 1872 the receipts in England, of American cheese, were 1,228,184 boxes, amounting to 73,691,040 pounds. This gives an increase of receipts of American cheese in England in 1873 above those of 1872 of 508,311 boxes, amounting to 30,498,660 pounds. But with all this additional supply the stocks in London and Liverpool, the Corduroys say, are not excessive.

The receipts of Cheese in New York City during the year 1873 were nearly 2,000,000 boxes, or in round numbers 120,000,000 pounds, while in 1872 they were only 99,964,200 pounds, or an increase in 1873 of about 20,000,000 pounds.

England has taken more American cheese this year than the whole product made in the United States in 1860, the amount produced then, according to the United States census, being 103,663,927 pounds. The prices paid for cheese in the United States, have, as an average, been lower during 1873 than in 1872, though doubtless the average would have been nearly the same, had not the panic which occurred in September had a depressing influence on the fall trade.

We commenced the year 1873 with prices ranging from 14½ to 15½c. in January, ruling from 16½ to 17c. in February and March, dropping to 15c. in April and May, and from the middle of June to the first of October ruling from 13 to 13½c. In October, November and December the market was pretty steady at 14 to 14½c., with an occasional advance of a quarter of a cent.

The Messrs. Corduroy in accounting for the increased receipts of American cheese in England, argue that consumption has been promoted by prices having been on a moderate scale, the best qualities being so much cheaper than cheese of a similar character produced in England. Again, in the manufacturing districts of England, employment has been general and wages good, which in part no doubt accounts for the large demand for American cheese.

One growing feature in the cheese trade observable from year to year in this country, as well as in England, is that buyers as a rule are more careful in their selections as to quality, color, flavor, firmness and soundness of condition. Soft, damaged and inferior cheese, are less saleable, even at reduced prices, than they were a few years ago. As our quality improves, consumers become educated in their tastes, and cannot go back to a poor article, which, before they learned to have better things, was not so much noticed.

Dealers, too, find that good cheese moves more easily than

poor, and as a general rule is sold without loss, while a few turns at purchasing "dead beats," even at low prices, often make sad inroads on profits; and when heavy losses are sustained, they sharpen a buyer's discriminating faculties in making his selections very considerably.

Our dairymen, therefore, should strive to make a good article, and recognize the fact that poor stuff pays less from year to year.

AUCTION SALES OF CHEESE.

The great value of country markets, where buyers and sellers meet on certain days of the week for transactions in dairy produce, is now pretty generally recognized. At Little Falls, and other leading country cheese markets, the factories sell large quantities of cheese by samples. These samples are simply "plugs"—cut by the cheese monger's iron—representing a specimen of each day's cheese, which it is desired to sell. The "plugs" or cuttings of cheese, as soon as drawn, should be placed in small bottles designed for the purpose, and tightly corked, and the bottles numbered, so as to show the age of each sample of cheese. By thus enclosing the samples, they are kept from the air, and do not undergo change while being carried to market. Hence, the buyer gets a correct idea of the color, texture and quality of the several days' cheese, which any factory puts upon the market.

The cheese must be in all respects as represented, for a seller once caught in deception, or in adding some poor or inferior cheese to the lot he sells for good, has not only to bear all losses on such cheese, but he is afterward regarded with suspicion, and will not obtain the highest prices for his goods by selling from samples.

A large number of sellers with samples meet weekly at Little Falls, often representing 200 or more factories, and some of them come from a long distance. The buyers also congregate here in considerable numbers on market days, and after looking over samples and discussing the state of the trade, the home and foreign demand, the cost of freight and the latest cable quotations from London and other points, transactions begin to take place.

At Little Falls, the sales of factories during summer do not begin until late in the afternoon, and often as late as 4, p. m., and they are not unfrequently kept lingering along until 7 or 8 o'clock, before transactions are closed.

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salesmen early in the day, and thus the quantity on the market is generally known before any transactions take place.

The fault in this system is the delay in completing sales until late in the day. A constant chaffering is going on between buyer and seller, prices being offered by one buyer and raised by another, without getting down to business till the fast closing of the day compels them to action. Factorymen from a long distance complain that they are kept in the market a longer time than necessary, and that often they cannot reach home till late at night or next morning.

To avoid this evil it has been suggested to have the cheese sold in different lots at auction. Let the samples be shown, and the discussion of prices, cable quotations, &c., be effected early in the day, but at a certain hour in the afternoon, say 2, p. m., let the sales promptly commence at auction, and the competition among different dealers is such that it is believed the cheese will sell at a price equally well with that obtained under the present system.

To avoid loss on account of the bids not rising to the full value of the seller's estimate, each factoryman is to be allowed one bid, and he can thus withdraw his cheese from the market, or put it at a figure which he is willing to accept.

I cannot see why cheese would not sell on its merits in this way, and as good prices realized to the producer as under the present system, and I am glad to see that this plan has been recently inaugurated in the Western part of the State of New York. The *Elmira Gazette* mentions an important sale of cheese at Collins' Centre, N. Y., on the 29th of January, when buyers were present in considerable force. The cheeses offered were the product of the Mansfield and Collins factories, owned by W. A. Johnson & Co., of Collins' Centre, and comprised 3000 boxes of the October and November make. The cheese was offered for sale to the highest bidder. Mr. Wade bid 14 $\frac{3}{4}$ ¢., Mr. Bona offered 14 $\frac{3}{4}$ ¢., Mr. Cary bid 15¢., Mr. Hayward signified his willingness to pay 15 $\frac{1}{4}$ ¢., and after considerable excitement Mr. Cary bid 15 $\frac{1}{4}$ ¢., and the lot was knocked off to him. The price, says the *Gazette*, is decidedly the highest of the season in the State, and may be accepted as an indication of a very firm market, for the balance of the old crop is now all in dealers hands.

During the coming season, I hope our different country cheese markets will at least try the plan of auction sales, for it seems to me they could be made satisfactory to all parties concerned in this interest.

CORN FODDER.

I have now detained you so long that I must bring my remarks to a close, and in doing so I would like to make an allusion to the fodder corn question. You have probably seen in the papers during the past two or three years some warm discussions respecting the value of corn fodder as a food for dairy stock. There are some people who denounce it in unmeasured terms, and doubtless the manner in which it is grown has led to a difference of opinion as to its value. I have used corn fodder as a soiling crop for many years, and have found it a great help during the hot, dry weather of August, when pastures fall off in productiveness. But it was as a fall and winter food that I had intended more particularly to speak.

The summer of 1873 was quite unfavorable for the hay crop of Central New York, the falling off from the average being about 33 per cent. Many dairymen were compelled to reduce their stock at a sacrifice, as stock of all kinds was exceedingly low, and in addition to this large quantities of Western corn was purchased, and the experiment is being tried to carry stock through on meal and half the usual quantity of hay. In Herkimer County the number of milch cows has been reduced lower than at any time during the past twenty years. Now, this state of things could have been avoided in part, had our farmers adopted more generally the practice of relying on sowed corn as a fall and early winter cattle food. In some instances this was very successfully practiced. As an example, I cannot do better than give you the following facts, from which you can draw your own conclusions:

Mr. La Mont, of Tompkins County, N. Y., has grown this year five acres of fodder corn, and he estimates the yield to have been at least 40 tons of cured fodder. His entire herd of horned stock, consisting of 40 cows and 9 head of young stock, has been kept on this fodder since it left the pasture, about the 1st of November till the 10th of January.

Mr. La Mont's practice, late in fall and early winter, after the cheese making season is over, is to give his cows all the sour milk resulting from his butter making, and a quart of shorts to each animal daily. The shorts are put into a large tub and the sour milk turned on, the whole thoroughly mixed and apportioned to each animal in equal quantity. This is the only additional food which the cows receive, and the stock he says, is in as fine, thrifty condition as any farmer could wish to see. This plan of wintering stock in part on corn fodder has been practiced

by Mr. La Mont for several years, and always with the best success.

The usual practice is to break up green-sward lands that have laid in grass from ten to twelve years. The land referred to was plowed about the 25th of May to the depth of eight inches. It was immediately harrowed thoroughly to get a good seed bed, and the corn (Western variety) was drilled in with the machine known as the "Farmer's Favorite," two and a-half bushels of seed being used to the acre. This makes the rows about eight or ten inches apart. The whole was finished about the first of June, and no manure or other fertilizers were used in the crop.

About the last of August, or first of September, the crop will be fit to cut. The stalks will have attained a height of from six to eight feet, and the rows on the outside will be "eared out," more or less, though, of course, such ears will be small, immature, and may be classed with what is commonly called "soft corn." Mr. L. cuts the fodder with a reaper, and says that for this purpose a strong and heavy machine is required. He uses the Buckeye, which does the work in the best manner. After cutting, it is preferred to leave it a day or so to wilt, when it is tied up in bundles, and immediately set up in shocks. The shocks are made larger than one man can conveniently handle, and hence two men are employed for this part of the work. From fifteen to twenty bundles are placed in a shock, set so as to make it of a round shape. Then the men take out sufficient stalks for the band, lapping them together and twisting them, a man at each end of the band. The tops of the bundles or shocks are now drawn together and tied with the band, and another band is tied around about mid-way of the shock, and the work is complete. These shocks are left standing in the field until wanted for use, when they are hauled to the barn, as required from time to time, and fed to the cattle.

Mr. La Mont says that fodder corn, properly bound and shocked, as I have described, will cure out nicely in the field, and is not injured on account of standing out during the time named, except, perhaps, on some of the outside leaves of the shock. The fodder opens clean and bright, and is highly relished by stock, and he esteems it in all respects equal to hay. His stock appear well satisfied with their rations, the animals keeping in as good condition, as to flesh, health and vigor, as those which have been kept on hay. He thinks if corn fodder is such "poor innutritious food," as some have represented, he must have observed the result long since in his stock, both as to loss

of flesh, and in the depreciated quantity of milk yielded. On the contrary, his cows have made a good yield of milk in November, and their condition as to flesh and vigor are as heretofore described.

In 1872 the stock was kept in the same manner, and the yield was at the rate of 450 pounds of cheese, and 10 pounds of butter per cow, besides supplying what milk and butter was used in a family of seven persons. His experience in feeding corn fodder dates back through a period of ten years. He uses fodder corn as a soiling crop for stock in summer when pastures are short, and he esteems it highly for this purpose, as it keeps up the flow of milk, and the cows are held in high condition.

Other farmers in Tompkins County practice the same system as that practiced by Mr. La Mont, and one of his neighbors, Mr. Peter Mulks, who is somewhat noted as a "fancy butter" maker, has raised as much as twenty acres of corn fodder.

What then are we to infer from this statement? Here we have 49 head of cattle kept upon the corn fodder of five acres for a period of nearly two months and a half, or up to the 10th of January. Practical dairymen can very well estimate whether such a crop as that raised by Mr. La Mont is a profitable crop. I do not know the price of hay in Tompkins Co., but in Herkimer Co. it has been sold at from \$20 to \$25 per ton. It has been estimated that a good, fair sized cow will consume on an average in winter twenty-five pounds of hay per day, and putting hay at \$20 per ton, the money value of the food consumed, per cow, would be at the rate of twenty-five cents per day.

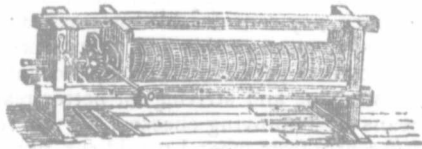
But, say in the case of La Mont's herd, it is but twenty cents a day for each animal, and we have the following: Forty-nine head of cattle, at 20 cents per day, is \$9.80, which, multiplied by seventy days, (the time they were fed on the stalks) we have \$686, as the value of the five acres of corn fodder.

What crop, considering the amount of labor involved, has been more profitable? But, say that the animals consumed food to the amount of only ten cents per day per head, and we still have the five acres of fodder corn, amounting to \$343. Truly, a very valuable crop for five acres.

Again, the question may be solved in another way. How much hay will a cow consume in seventy days? At twenty pounds per day—a low estimate—we have 1400 pounds, but to get our figures down low enough, we will suppose the animal

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consumes but half a ton of hay in the seventy days. Then, we have the total consumption of the La Mont herd, up to the 10th of January, if represented in hay, amounting to $24\frac{1}{2}$ tons, and this, at \$20 per ton, amounts to \$490, as the product of the five acres. In whatever way the question may be viewed, I think there can be no doubt but that Mr. La Mont's fodder corn crop has been a very profitable one, and the statistics given cannot be without value to dairymen.



AN ADDRESS,

DELIVERED BEFORE THE DAIRYMEN'S ASSOCIATION OF ONTARIO,
AT BELLEVILLE, ONTARIO,

THURSDAY, FEBRUARY 12, 1874,

BY

L. B. ARNOLD, ESQ.,

SECRETARY AMERICAN DAIRYMEN'S ASSOCIATION, ROCHESTER, N.Y.

SUGGESTIONS FOR IMPROVEMENT IN CHEESE MANUFACTURE.

For people from the other side of the line to come here to talk to you about cheese-making seems almost like carrying coal to New Castle. The general features of your processes of manufacture are the same as ours, and your cheese, like ours, has attained a high reputation. But they stand differently in the market. Yours excels in keeping; ours in texture and flavor. The high position which the goods of both nations have assumed, in the short time since any considerable progress was started in either, I look upon as a reasonable and just cause of pride. But perfection has nowhere yet been attained, and until it is we ought not to cease studying and striving for better results. In discussing the means of improving cheese I see no reason for addressing you differently from what I would the people of my native State, as you are right along side of us in the onward march.

To make an intelligent start toward improvement in anything, the first point is, or should be, to fix in our mind's eye clearly the end to be attained. In cheese-making we want the standard of qualities at which we are to aim well understood. Unless we do this we shall work at random, and be as likely to go wrong as right. It is not enough that we make a product to suit ourselves. It is not enough that it has intrinsic value. We must make it to suit the taste of the parties who are to purchase and consume it. We should study well and understand clearly the standard of excellence set up in the mind of

the purchaser, and make that standard the polar star of our efforts. In short, we should have a clear and definite idea of what the market calls for before we change a step toward visiting that market. When the requirements of the market are understood, the means of filling them will be searched out and applied.

As I go about among the factories and dairies, I find a confused and indefinite idea of what is desired in the market to which the cheese that is being made is intended to go, to be a great stumbling block in the way of progress. If factorymen are not posted as to the quality their goods should show to meet the taste of the consumers they are intended to supply, how can they modify their modes of making to suit that taste? They can only work in the dark and by guess, and be as likely to go wrong as right. Manufacturers should be so well posted in regard to what the market calls for as to qualify them to select and make purchases, if occasion required, to fill orders and act as dealers or middle-men. How many manufacturers, think you, could be safely trusted to act as agents to select for the different markets?

You will probably ask how is the tyro in cheese-making to learn what is required at his hands? He must lend his energies to this point. He must go about among his fellows and compare practices and products. Especially should he compare his cheese with that which commands the highest price in the market, and note well the points of difference and the cause. Each manufacturer should see all the factories in his vicinity, and make himself familiar with the different practices and their results. In this way, excellencies and defects will become conspicuous and familiar. The manufacturer can then adopt what is desirable and avoid what is not.

Occasions like this may do a great deal toward disseminating correct information in regard to quality. Dairymen's conventions, I have learned, are made up largely of factorymen; and if, while they are assembled, samples of standard cheese could be exhibited for general inspection, it would do much toward settling in their minds the qualities they ought to produce.

Cheese buyers soon acquire this knowledge by going into the market places and examining the goods which are preferred, and cheese-makers had better take the same course, rather than not know just what is wanted. Where buyers go to the factories to purchase they can, if they will, impart a great deal of valuable information. I don't know how it is with dealers in

this country, but in New York, with the hope of driving a better bargain, they are more inclined to flatter the parties they deal with than to notice any errors that might possibly wound their pride. Where Boards of Trade or market days are established, the manufacturers may find an easy means of posting themselves in regard to desirable quality.

When visiting factories in a strange neighborhood, I have often invited a manufacturer to go with me as a guide, and it never fails, at the end of the journey, that he acknowledges himself amply paid for his time. Let two or more manufacturers take a carriage and spend a few days each season in riding from factory to factory, and discuss the causes of the various peculiarities, they will note, and they will make more progress in a day thus spent than in a whole season in working in the factory alone.

Cheese fairs, such as was held at Ingersoll last season, afford a most excellent opportunity for cheese-makers to learn what competent judges esteem best. Not only was a great variety of make which aspires to be best present on that occasion, but the samples which the judges decided to be best were publicly exposed for critical inspection, so that all who desired might examine for themselves, and see in what their superiority consisted. Such occasions afford a means of information that no manufacturer can afford to let pass. At such a fair the judges ought to be the best that can be obtained, and entirely free from any prejudice or bias, so that makers and all concerned can rest on their decisions. This establishment of fairs exclusively for dairy products is regarded as a very important item in the right direction, and is a point in dairy progress in which Canadians are ahead of us on the other side of the line.

QUALITY OF MILK.

But no one can make good cheese without good milk. One might as well attempt to make fine cloth out of coarse wool as fine cheese out of faulty milk. There is, however, much less depending upon the milk than is generally supposed, and much less than I once supposed. Milk varies with the food and the soil on which it is produced. Milk on loamy and gravelly land is quite different, and does not work alike. But milk that is sound will make good cheese on either soil. The important point is to have it free from objectionable taints and in a healthy condition.

A little disease in milk works a great deal of evil. To guard against injury from this cause is one of the most important means of improvement.

There is perhaps no single point in the quality of milk that is more detrimental to the quality of cheese, either on the north or south side of the lakes, than the temporary defects in the health of cows occasioned by excessive heat. Cattle often suffer as much or more, both in health and comfort, from excessive cold in winter, than they do from the excessive heat of summer; but the excessive cold does not make its impress on the products of the dairy like extreme heat, because the cold comes at a time when there is not much milk to act upon. But still, exposure to cold has an effect upon the general character of the dairy, because by operating against the general welfare of the animal, it acts against the general quality of its milk. Even the isolated causes which produce occasional ailments should be avoided in any system of correct dairying, because, though temporary, they are liable to do injury while they last. They more or less depress the tone of the dairy in which they chance to occur. I have no occasion to dwell upon such defects here. They are what all herds are subject to, and are at once removed by the prudent dairyman as soon as seen.

It is the excessive heat of summer that stands so much in the way of high quality. Tainted milk, you all know full well, is the great bane of the cheese interest. If you can keep clear of that, you are comparatively safe. A good evidence of the truth of this statement is the result of the season just past. We had but little hot weather last summer, and but little bad cheese. Tainted milk is generally identified with hot weather. The query has been raised, What is the cause of tainted milk? I have traced it to a feverish condition of the cows, but a query arises back of that, What is the cause of the fever? The causes of feverishness are multifarious. The most common one is oppressive heat. The influence of heat in producing taint may be demonstrated by a little attention. It will be noticed that taint comes and goes with the rise and fall of the mercury in the thermometer, showing that uncomfortable heat is the immediate cause. Though this is the common cause, it is not always the cause. Feverishness and consequent taint will follow if the water is scarce or bad; or if the cows break into the oat or corn field; or if unwittingly the keeper turns them suddenly into rank, green clover, which is perhaps wet with rain or dew; or if fed with too much rich food of any kind, or worried by dogs. Whatever heats the blood of the cows produces taint, and it never occurs without that condition. By *taint* I do not mean to include the deviations from its natural flavor occasioned by the use of turnips or cabbage, or other strong

smelling or tasting foods, that carry their odors or flavors into the milk; I only mean the peculiar *cowey* smell that develops in milk and leads on to floating curds in its extreme development.

It is this kind of taint resulting usually from only a temporary derangement of health that I would have you especially guard, for the further improvement of your cheese.

I have designed to-day to touch only upon some of the more prominent causes that stand in the way of further progress in improving cheese. I have brought forward the subject of excessive heat as one of the things the effects of which there is need of investigating closely. I do not mean that this need is peculiar to the people of Ontario or of the Dominion. It is a need which the people of my own State and of the United States have as much occasion to look after as you. I bring it forward and urge it upon your attention because, though important, it has been overlooked, or, rather, underestimated. I present it to you *now*, because I have the benefit of the effects of a cool and even season to compare with the hotter ones which have gone before—a benefit which I would not have lost either to you or to my own countrymen. The improved quality of cheese which has resulted in a great measure from the unusually even temperature of the season just past, is one of great significance to the cheese interests of both countries. It enables us to contrast the qualities resulting from sound health and comfort in the one case, with those of deranged health and discomfort in the other. It enables us to compare the effects of an enlarged trade and open market abroad, and increased consumption at home, with a market clogged and prices depressed by diminished consumption, both at home and abroad, by reason of goods with an unpalatable taste and perishable nature.

Other causes may have conspired to produce the increased demand for our goods in the markets of Great Britain, which have taken of your cheese and ours 30,000,000 more this year than last, and would have taken still more if we had had it for them, but it will hardly be questioned by any one that improved quality is the leading cause. One hot, sultry summer, with its ill-flavored and short-lived cheese, would counteract all we have gained by this circumstance, and set us back where we were before, unless we forestall its effects.

This is so apparent that I trust the necessity of discussing the matter, and bringing it forward in time to guard against such consequences, will be deemed appropriate and essential.

What is the remedy for excessive heat? The heat of

summer cannot be avoided, but its effects can, to a large extent, be obviated. Shade trees in the pasture or artificial sheds give effectual protection against the scorching rays of the sun, and against heating the cows' blood. Every one knows how the broiling heat of the sun affects himself, and it operates the same on his stock, especially cows in milk. From its burning rays we appeal to shade, and the dairyman ought not to deny his cows what is so essential to his own comfort. A plenty of good, cool water, too, serves to keep down temperature in the blood of cattle as it does in the blood of men. There are very few whose experience has not impressed upon their minds a clear but unpleasant conviction of how oppressive heat becomes when accompanied by thirst, and the large amount of water required in hot days to keep one comfortable. Cows feel the need of water in such weather even more than men, and if the supply is bad or cut short, their sufferings become severe.

The cow in milk, like the nursing mother, is sensitive to the influence of heat. She cannot endure what can be endured by animals that have nothing to do but to eat and assimilate. As the nursing infant becomes a sensitive index to point to the heated blood of the mother, so does the milk of the cow point, by its odor and its working, to the heated blood of the cow. A plentiful supply of water is one of the most efficient means of keeping the milk of cows in its normal condition. A plenty of shade and a plenty of water for hot days, when the mercury is 80° to 100°, ought to be deemed important. The mere mention of the combined effects of heat and thirst ought to be sufficient to make any dairyman comprehend and appreciate how important it is to protect his cows against them.

There is another circumstance in the summer treatment of the dairy to which I wish to call your attention as a means of improving the cheese of the country. I allude to the practice of soiling. Soiling pays in summer droughts for the sake of the extra keep it affords. It pays in the increased amount of stock it enables a dairyman to carry on a given number of acres; it pays in the increased quantity of milk produced by keeping up a continuous flow; but it pays equally well in its promoting healthy milk in the heated season by the relief to the herd from exercise, and by avoiding exposure to sunshine for filling themselves by grazing.

To keep a cow out in the hot sun to fill herself from a short pasture can hardly do otherwise than raise the temperature of her blood, and thus develop taint. By taking quickly a meal of fodder corn, or green, wilted clover, she may lie in the shade

and ruminate in comfort, and fill the dairyman's pail with healthy milk, cutting off tainted milk and bad cheese.

Another cause of defect in our cheese-making grows out of the circumstances connected with hay-cheese. In preparing food for their flocks in winter, farmers do not always study to secure it when it will do them the most good. They are more apt to look after the largest *quantity*. The product of our meadow makes the greatest bulk and greatest weight when the seed begins to fill; but it is not then in the best condition to support life, nor to yield the best dairy products. The well-ripened food which dairymen are in the habit of laying up for their herds in winter, has lost much of its valuable properties. Its albuminoids, as they slowly work their way through the stems and leaves, where they are elaborated, toward the top, for the perfection of the seed, which is their end and aim, become changed in form and diminished in amount. Their substance becomes harder and firmer as the plants grow old, and hence less susceptible to change. They are more difficult of digestion, and when elaborated into milk, the cheesy matter which results has the same hard and unchangeable inclinations the caseine had in the plants. It is hence that the cheese derived from matured fodder is harder and more difficult to cure than when obtained from young and tender herbage. The fatty matter in maturing plants undergoes an equal change. The fats which in young plants were soft, aromatic, and highly colored, have become in the riper stage hard, white, insipid, and scanty. The milk from such herbage is poor in every sense of the term. Both the butter and cheese from such milk are pale and poor, and wanting in the fine, nutty flavor that belongs to both when derived from grass. The poor quality of hay-cheese is not unchangeable to the fact of the cows living on dry food, for dried grass makes excellent cheese. It is due to the too fully matured condition of the herbage when cut. If dairymen desire to produce milk out of the grazing season, they ought to provide their cows with early cut grass or clover, roots or mill-feed, or grain—something that will give flavor and richness to the butter or cheese to be made from it. The cheese made from such food compares well with grass-cheese. It cures readily, and is good flavored, while ordinary hay-cheese appears more like the skim-cheese of the creameries.

To fill the market with hay-cheese that is unpalatable and difficult to cure, and difficult of digestion, is to check consumption and injure the reputation of cheese generally. Unless made and cured quite differently from what it usually is, or unless the

quality of milk is much improved, it would be better for all concerned to omit making cheese till grass comes, and use the milk for making butter or veal. Poor cheese is always a detriment to the cheese interest. It clogs the market and depresses prices. It injures consumption, because it stands in the way of better goods that would please the palate and invite to a larger use. It inclines all who have to do with it to mark down the reputation of all cheese by associating the poor in the estimation of the good.

If farmers will prepare proper food for their cows in spring they can avoid all the deleterious effects that now follow from hay-cheese, and increase their profits at the same time. There is a wide chance for improvement in the matter of spring cheese, and there is an urgent necessity of pressing it upon the attention of dairy farmers. Another defect is apt to occur with hay-cheese on account of skimming. The milk at this season of the year is often kept longer than in warm weather. The cream, by reason of longer standing and the coolness of the atmosphere, becomes quite solid and firm, and the temptation to take it off is too strong to be resisted, and milk which is too poor for cheese-making is made still poorer by the use of the skimmer. This practice should be sternly avoided unless the milk is made unusually rich by high feeding. I do not know that the dairymen of Canada are any more at fault in respect to hay-cheese than the dairymen of the States. There is much need of improvement in both countries. On the other side of the line we are yearly giving more attention to the winter and spring food of our cows. Dairymen in New York now cut their hay twenty days earlier than they did twenty years ago, and twenty years hence they will cut it twenty days earlier than now. They feed more grain and roots than they formerly did; they have richer milk, which is made up when newer, and skimmed less than in former days; the curing is hurried by a more liberal use of rennet and warmer curing rooms than were once in use; and the more objectionable features of hay-cheese are gradually wearing away. I commend these improved practices to Canadian dairyman as worthy of their attention.

The means of improvement so far considered lie in the hands of the dairy farmers. I will now notice a few that pertain to the manufacturing. The processes of manufacturing cheese are communicated from one to another not by any fixed or clear and well defined rules written out to be studied, nor indeed with any clearly defined principles that one could fall back upon if he failed in the routine. In fact, the reasons for

doing as we do in dairy practices are but little considered or known. We learn the modes of making butter and cheese as matters of fact. Our instructions are received orally and illustrated and accompanied with practical examples. The manipulations which have accompanied the production of the best cheese are naturally supposed to be the most perfect, and they are handed from one to another and imitated as the standard of perfection. Having thus received our instruction with the impression fixed in our minds that our modes are the best that could be adopted, it is a very natural conclusion indeed to infer that if we apply our rules as they have been applied in the production of fancy cheese, and the product proves to be inferior, the fault is in the milk; that some defect in climate, water, food, or soil has made some defect in the milk which renders it deficient for cheese-making; and hence the further inference that the production of strictly fine cheese is limited to certain localities where certain varieties of soil, &c., exist. This I say is a *natural inference*, and it is one that has gained extensive credence in the minds of dairymen as well as others. No longer than two years ago, when I met the Association at Ingersoll, one of your oldest and most prominent dairymen said to me: "Our Canadian cheese is inferior in both flavor and texture. Our milk is different from New York milk. I don't believe it is possible from our milk here in Canada to make cheese which will equal yours in York State." I admit the premises, but deny the conclusion. It is not a necessary consequence. I once entertained views similar to those, but have outgrown them now. Our processes of cheese-making being copied, we work everywhere by the same rule. This is unphilosophical. If, as my friend at Ingersoll said, your milk is different from ours, the mode of manufacturing ought to be different from ours. I am inclined to think that the Ingersoll man was right—that your milk is somewhat different from ours. I believe it is generally true that milk in different sections differs in some respects.

A striking incident, confirmatory of this statement, was related to me at the recent meeting of the American Dairymen's Association. Mrs. Huldah Smith, of Fairfield, Herkimer Co., N. Y., has been the manager of the factories known as the Fairfield Association, ever since it was built, which was, I think, about eight years ago. The factory is one of the very best in Herkimer County, and has been strictly a fancy factory under Mrs. Smith's superintendence. After making fancy cheese successfully for so long a time, she, last summer, left the factory

in the care of her children, and took charge of a factory in Michigan. She says it took her about all summer to get used to the milk—it worked so differently from the milk in Herkimer. She was at last able to manage it so as to make good cheese. The Herkimer mode of working would not do for the Michigan milk.

The experience of Mrs. Smith was my experience in moving from Herkimer into a grain-growing district in Western New York. It has been the experience of very many others who have gone out from that famous county to ply their art in different localities. They find it necessary to deviate considerably from their Herkimer modes of working.

Now, since Michigan milk is different from Herkimer milk, it should not seem a strange assertion to say that Canada milk is different from New York milk. Without the testimony of my friend at Ingersoll I should expect, from what little knowledge I have of the country, that the milk on both sides of the lakes would not work just alike. The parts of the country over which I have passed have appeared a little dryer than in the dairy districts of New York. It appears more like an exclusive grain region. The soil has seemed to have a little more sand in its composition on this side of the line than the other. But the free use of the plow has done much to give it a dry and compact structure that unfits it for standing drought. Ground that is much plowed becomes harder and dryer than the same kind of land not plowed, and is much less able to endure drought than land occupied more with grass. When one section is dryer than another, whether naturally or made so by much plowing, the elements of milk from the two places are not in the same condition. The cheesy matter from the dryer soil is harder than on the moister one, and does not break down so readily into soft, rich, salvy cheese. Since it does not cure so readily, it will keep longer; and this, I fancy, is the reason why cheese in the Dominion has acquired the reputation of having better keeping qualities than cheese in the States. I regard this peculiarity as no insuperable barrier to reaching an equally fine quality. It is, in my opinion, only objectionable by reason of its requiring to be manufactured differently to reach the same result, and this is only a question of time and experience, and patient attention.

The continued occupation of the soil for grazing and dairying is gradually wearing away the peculiar qualities of your milk. Where the soil is naturally dry, it will of course remain so, but abating the use of the plow, and covering the surface

more of the time with turf will have a tendency to make loamy soils looser and lighter, so that they will stand drought better. The grass will be fresher and greener, and the cheesy matter softer and more easily converted into rich cheese. Your milk needs to be worked somewhat differently from ours. It would resemble New York cheese more closely if worked at a little lower temperature and with a little more rennet, so that the curd should be ready for the press at the same time as usual. Your curds do not call for so large a development of acid as in Herkimer and other old dairy districts. Red clover makes a harder cheese than grass, and not so well flavored, though it will make more cheese from a given amount of pasture. As your pasture fields become old, and grass gradually takes the place of red clover, your cheese will improve in texture and flavor.

The process of manufacture which we call the *American Cheddar* will work admirably in your factories. In this process the whey is drawn before the curd is ripe enough to leave the vat; the curd is piled in one end of the vat, and the vat tipped so that the whey will drain off, and the curd is left in this situation to ripen, till it develops the requisite degree of acidity, when it is run through a curd mill and salted and put to press in the usual way.

Creamery practice will not be likely to succeed as well in Canada as in some parts of the States; not that there is any lack of richness in Canadian milk, for it is evidently as good as any; but because the presence of the cream is necessary to soften and hasten the curing of the harder cheesy matter, derived from your dryer soil. The same objection to skimming lies against creamery practice in our grain districts and much of our western territory. Wherever the factory system prevails there is a growing tendency toward skimming, at least the night's milk, and the time is coming when this can be done safely, for it is possible to make a good rich cheese of skimmed, or partly skimmed milk. A few manufacturers are doing that now; but it would be out of place now to encourage skimming in Canada or anywhere else. The general principles of cheese making, and the art of managing skim milk, must be better understood than they are to-day, to render skimming profitable or safe. It requires more skill to handle skim milk properly than whole milk, the proper methods of working them being quite different. It is not necessary that I should go into the details of working skim milk to-day. It will suffice to say that it should be worked with more rennet and at lower

temperature than whole milk while in the vat, but in the curing the temperature should be higher, and the process rapidly hurried along. Milk which is approaching sensible acidity should be managed very much in the same way.

As the subject of tainted milk has been prominently before the convention, and as cases of it are often everywhere occurring, a few words in regard to it seem to be called for.

"Tainted milk" is hardly an appropriate expression to indicate the milk so called. That kind of milk is the result of a peculiar variety of fermentation, in which a light oil is developed that occasions the peculiar odor and flavor that occur in milk known as "tainted milk." The flavoring oil is the same as that which gives the "cowy" odor to new milk. It is only intensified in the tainted milk of the factories. It becomes volatile at about 65 degrees, and slowly escapes from the milk. At higher temperatures it escapes rapidly. Heating tainted milk to 130 or above drives the odor all away, and leaves the milk in its ordinary condition. At 60 and below the oil scarcely evaporates at all; but remains in the milk, and gives a flavor instead of an odor. When separated from milk it appears as a very light oil, that is nearly destitute of color. It is now known that the presence of cream hastens the growth and activity of the rennet germs which curdled the milk and cured the cheese. It is also true that the presence of light flavoring oils contribute actively to the same end. I have met with nothing that so stimulates the growth of the active agent in rennet, as the oil that constitutes the so-called *animal odor* which distinguishes tainted milk.

There are always some of the same germs in milk that constitute the active agency in rennet, and the presence of this oil, or odor, as you may please to term it, so stimulates their growth as often to prove sufficient to curdle the milk without any addition of rennet. Spontaneous coagulation of milk while it was yet sweet has been of frequent occurrence in Rochester the past season from this cause. Such cases are not uncommon among dairymen. They occur all the sooner if the milk is kept covered and warm. In the treatment of tainted milk in cheesemaking this circumstance must be taken into consideration.

If milk that is to be made into cheese appears tainted, set a higher temperature than usual, and use less rennet; varying the amount according to the degree of taint, the more taint the less rennet. Let the curd remain in the vat till acid is strongly developed. Where the curd is cheddared, grinding is important. Cooling and airing are also important. If the curd is matured

in the whey, it will often prove a benefit to leave the curd in the sink over night, where it can be conveniently done. To put the usual amount of rennet in tainted milk, is to so hurry the curing process that the cheese soon becomes over ripe and spoils. But acidity is the great antidote for taint. It corrects the flavor of the taint, and keeps back the process of curing, and, if skilfully regulated, will hold the cheese in very nearly its normal condition.



APPENDIX.

QUESTIONS AND ANSWERS.

The following are the questions and answers as given by the various successful competitors at the Cheese Fair, held under the auspices of the Association in connection with the Agricultural Exhibition at Ingersoll, on the second and third days of October, 1873. The entries were all made in classes; these classes are arranged alphabetically, and the prizes consecutively, so that the answers given by the parties receiving the different prizes in each class will appear in rotation.

We would recommend a careful perusal of these answers by all engaged in the manufacture of cheese, as undoubtedly a great many new and useful ideas may be gathered therefrom, it being in order that cheese makers and dairymen generally might learn what rules were followed by the most successful manufacturers that these answers were proposed and required for publication.

There are doubtless a great variety of rules practised by different makers, and circumstances may often require this variance; but we certainly think some definite practice should be followed, and it is in order that our members may be able to select if possible the best method that we offer these questions and answers for their perusal, and we hope that a study of them may not be without this beneficial result.—SECRETARY.

CLASS A—FIRST PRIZE.

1. Name of Factory?—Rodgerville.
2. Name of Exhibitor and P. O.?—A. Malcom, Rodgerville.
3. Name of maker?—Thomas Topp.
4. Date of each cheese shown?—August 8th, 13th, 22nd, 27th; September 2nd and 8th.
5. The ordinary milk of how many patrons was used in making these cheese?—One Hundred and Seventy.
6. Were these cheese made by using night's and morning's milk?—They were.

7. If made twice per day was the milk cooled before setting?
—Once per day.

8. Temperature of milk at setting?—84 degrees.

9. Describe method of cutting curds?—First length ways, then cross ways with perpendicular; then just before stirring with horizontal.

10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. From $\frac{3}{4}$ to $1\frac{1}{2}$ hours, according to condition of milk.

11. Is curd soured before dipping?—Whey slightly acid, allowed to develop in curd before salting.

12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron.

13. What kind of rennets were used?—English.

14. What kind of annatto was used?—Annattoine.

15. What kind of salt?—Canadian.

16. Quantity of salt used per 100 lbs. curd?— $2\frac{1}{2}$ lbs. per 100 lbs. cheese.

17. Was curd ground, and how many times?—Ground once.

18. Was curd salted previous to grinding?—No.

19. Describe treatment in curing room, temperature, ventilation, &c.?—They were treated in the ordinary way, temperature between 65 and 70 degrees.

CLASS A, SECOND PRIZE.

1. Name of Factory?—Campbleton.

2. Name of Exhibitor and P. O.?—Adam Bell, Tilsonburg.

3. Name of Maker?—Adam Bell.

4. Date of each Cheese shown?—August 7, 15, 21 and 26; September 3 and 8.

5. The ordinary milk of how many patrons was used in making these cheese?—Fifty-two.

6. Were these cheese made by using night's and morning's milk?—Yes, they were.

7. If made twice per day was the milk cooled before setting?
—Only made once per day.

8. Temperature of milk at setting?—84 degrees.

9. Describe method of cutting curds?—Cut length ways and let settle about ten minutes, and then cut cross ways; then lengthways again with perpendicular knife.

10. Highest temperature of scalding curd, and time required in scalding?—Ninety-six. One hour and a half.

11. Is curd soured before dipping?—Yes.

12. What tests or means are used to ascertain when curds are ready for dipping?—The hot iron.
13. What kind of rennets were used?—Canadian.
14. What kind of annatto was used?—Mitchell's.
15. What kind of salt?—Factory filled for August, and barrel for September.
16. Quantity of salt used per 100 lbs. curd?—Two and a half.
17. Was curd ground, and how many times?—Ground once.
18. Was curd salted previous to grinding?—Salted after grinding.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Turn and rub once per day. Temperature about 65 degrees, as near as possible.

CLASS A—THIRD PRIZE.

1. Name of Factory?—Culloden Branch.
2. Name of Exhibitor and P. O.?—William A. Ellis, Culloden.
3. Name of maker?—William A. Ellis.
4. Date of each cheese shown?—August 6, 14, 20 and 29; September 3 and 11.
5. The ordinary milk of how many patrons was used in making these cheese?—Thirty-five.
6. Were these cheese made by using night's and morning's milk?—They were.
7. If made twice per day was the milk cooled before setting?—It was.
8. Temperature of milk at setting?—84 degrees.
9. Describe method of cutting curds?—With perpendicular knife cut length ways of vat and cross ways, let the curd settle, then cut the same as first.
10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. 1½ hours, applying heat.
11. Is curd soured before dipping?—It was.
12. What tests or means are used to ascertain when curds are ready for dipping?—Smell and taste, hot iron occasionally.
13. What kind of rennets were used?—Patrons.
14. What kind of annatto were used?—Mitchell's.
15. What kind of salt?—Stapleton salt.
16. Quantity of salt used per 100 lbs. curd?—2½ lbs.
17. Was curd ground, and how many times?—Ground once.
18. Was curd salted previous to grinding?—Part previous to grinding, part after.

19. Describe treatment in curing room, temperature, ventilation, &c.?—Turn once a day ; temperature from 70 to 80 degrees ; ventilate from bottom, through roof and windows.

CLASS A—FOURTH PRIZE.

1. Name of Factory ?—Londesboro.
2. Name of Exhibitor and P. O.?—Callander Scott & Co.
3. Name of maker ?—E. Hunter.
4. Date of each cheese shown ?—August 4, 11, 18 and 28 ; September 4 and 9.
5. The ordinary milk of how many patrons was used in making these cheese ?—One Hundred.
6. Were these cheese made by using night's and morning's milk ?—Yes.
8. Temperature of milk at setting ?—83 degrees.
9. Describe method of cutting curds ?—Cut first with perpendicular ; then with horizontal knife.
10. Highest temperature of scalding curd, and time required in scalding ?—96 degrees. Two hours.
11. Is curd soured before dipping ?—Yes.
12. What tests or means are used to ascertain when curds are ready for dipping ?—Hot iron.
13. What kind of rennets were used ?—C. P. Rennets.
14. What kind of annatto was used ?—Mitchell's Fluid Annatto.
15. What kind of salt ?—Clinton salt refined.
16. Quantity of salt used per 100 lbs. curd ?—From two to two and a half lbs.
17. Was curd ground, and how many times ?—No.
19. Describe treatment in curing room, temperature, ventilation, &c.?—70 degrees. Ventilated through the floor.

CLASS A—FIFTH PRIZE.

1. Name of Factory ?—Ontario.
2. Name of Exhibitor and P. O.?—H. S. Losee, Norwich.
3. Name of Maker ?—H. S. Losee.
4. Date of each Cheese shown ?—August 1, 8, 18 and 22 ; September 2 and 9.
5. The ordinary milk of how many patrons was used in making these cheese ?—Sixty.
6. Were these cheese made by using night's and morning's milk ?—Yes.

7. If made twice per day was the milk cooled before setting?
—Not made twice a day.
8. Temperature of milk at setting?—82 to 84 degrees.
9. Describe method of cutting curds?—First check curd with perpendicular knife; when ready to apply heat, cut length ways with horizontal knife.
10. Highest temperature of scalding curd, and time required in scalding?—Ninety-eight degrees. One hour.
11. Is curd soured before dipping?—Yes.
12. What tests or means are used to ascertain when curds are ready for dipping?—Taste and hot iron.
13. What kind of rennets were used?—C. P. and patrons.
14. What kind of annatto was used?—Mitchell's.
15. What kind of salt?—Liverpool.
16. Quantity of salt used per 100 lbs. curd?—2 7-10 lbs.
17. Was curd ground, and how many times?—Not ground.
18. Was curd salted previous to grinding?—No.
19. Describe treatment in curing room, temperature, ventilation, &c.1—Turn cheese every day; temperature 60 80 degrees; ventilated up through bottom floor, and up through roof.

CLASS A—SIXTH PRIZE.

1. Name of Factory?—Middleton & Bayham.
2. Name of Exhibitor and P. O.?—O. P. Mabee, Tilsenburgh.
3. Name of maker?—Joseph Dickinson.
4. Date of each cheese shown?—August 7, 15, 21 and 28; September 4 and 10.
5. The ordinary milk of how many patrons was used in making these cheese?—About forty.
6. Were these cheese made by using night's and morning's milk?—Yes. Drawn once a day.
7. If made twice per day was the milk cooled before setting?
—Not made twice.
8. Temperature of milk at setting?—82 degrees.
9. Describe method of cutting curds?—Length ways and cross ways; then break gently with hands.
10. Highest temperature of scalding curd, and time required in scalding?—94 degrees. One hour.
11. Is the curd soured before dipping?—No.
12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron and taste.
13. What kind of rennets were used?—American.
14. What kind of annatto was used?—Annattoine.
15. What kind of salt?—Goderich.

16. Quantity of salt used per 100 lbs. curd?—2 7-10 lbs.
17. Was curd ground, and how many times?—No.
18. Was curd salted previous to grinding?—No.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Turned once a day. Temperature 65 to 70 degrees.

CLASS A—SEVENTH PRIZE.

1. Name of Factor?—Wyoming.
2. Name of Exhibitor and P. O.?—John E. Anderson, Wyoming.
3. Name of maker?—John E. Anderson.
4. Date of each cheese shown?—August 7, 13, 21 and 23; September 6 and 9.
5. The ordinary milk of how many patrons was used in making these cheese?—Twenty-seven.
6. Were these cheese made by using night's and morning's milk?—Yes.
8. Temperature of milk at setting?—84 degrees.
9. Describe method of cutting curds?—Cut length ways; stand 15 minutes; cut cross ways twice.
10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. 50 to 80 minutes.
11. Is curd soured before dipping?—Yes.
12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron and taste.
13. What kind of rennets were used. Irish.
14. What kind of annatto was used?—Mitchell's Liquid.
15. What kind of salt?—Goderich.
16. Quantity of salt used per 100 lbs. curd?—2½ to 2¾ lbs.
17. Was curd ground, and how many times?—Ground once.
18. Was curd salted previous to grinding?—Yes.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Turned and rubbed daily; temperature 70 to 80 degrees; ventilated by windows.

CLASS A—EIGHTH PRIZE.

1. Name of Factory?—Woodstock.
2. Name of Exhibitor and P. O.?—G. V. D'Long.
3. Name of maker?—G. V. D'Long, Jr.
4. Date of each cheese shown?—August 4, 9, 15 and 29; September 5 and 10.
5. The ordinary milk of how many patrons was used in making these cheese?—Sixty.

6. Were these cheese made by using night's and morning's milk?—It was.
8. Temperature of milk at setting?—82 to 84 degrees.
9. Describe method of cutting curds?—Cut with perpendicular knife.
10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. One hour to one hour and a half.
11. Is curd soured before dipping?—It is.
12. What tests or means are used to ascertain when curds are ready for dipping?—By means of hot iron.
13. What kind of rennets were used?—C. P. Rennets.
14. What kind of annatto was used?—Mitchell's.
15. What kind of salt?—Common barrel salt.
16. Quantity of salt used per 100 lbs. curd?—2 7-10 lbs.
17. Was curd ground, and how many times?—Not ground.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Rubbed and turned once per day; ventilated through floor and roof.

CLASS A—NINTH PRIZE.

1. Name of Factory?—Fallarton.
2. Name of Exhibitor and P. O.?—Wm. Huxley, Ingersoll.
3. Name of maker?—William Huxley.
4. Date of each cheese shown?—August 5, 11, 20 and 30; September 2 and 8.
5. The ordinary milk of how many patrons was used in making these cheese?—One hundred and seven.
6. Were these cheese made by using night's and morning's milk?—Yes.
7. If made twice per day was the milk cooled before setting?—Yes.
8. Temperature of milk at setting?—84 degrees.
9. Describe method of cutting curds?—Perpendicular twice, horizontal once.
10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. From one to three hours.
11. Is curd soured before dipping?—Yes.
12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron and smell.
13. What kind of rennets were used?—English and Patrons.
14. What kind of annatto were used?—Mitchell's Fluid.
15. What kind of salt?—Liverpool Factory Filled.
16. Quantity of salt used per 100 lbs. curd?—2 lbs. to 2½ lbs. according to acid.

17. Was curd ground, and how many times?—Only ground when needed; could not say these were.

18. Was curd salted previous to grinding?—No.

19. Describe treatment in curing room, temperature, ventilation, &c.?—Taken care of as well as could be under circumstances. Ventilation through floor and windows. Temperature as near 70 degrees as possible.

CLASS A—TENTH PRIZE.

1. Name of Factory?—J. S. Henderson's.

2. Name of Exhibitor and P. O.?—J. S. Henderson, Ingersoll.

3. Name of maker?—L. D. Monk.

4. Date of each cheese shown?—August 5, 14, 20 and 25; September 3 and 8.

5. The ordinary milk of how many patrons was used in making these cheese?—Thirty-five.

6. Were these cheese made by using night's and morning's milk?—August cheese made from morning's milk; September made mixed with night's milk.

7. If made twice per day was the milk cooled before setting?—Cooled.

8. Temperature of milk at setting?—84 degrees.

9. Describe method of cutting curds?—Cut length ways and cross ways with perpendicular knife, and cut lengthways with horizontal.

10. Highest temperature of scalding curd, and time required in scalding?—Ninety-eight degrees. About two hours.

11. Is curd soured before dipping?—Yes.

12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron.

13. What kind of rennets were used?—Butcher's.

14. What kind of annatto was used?—Mitchell's.

15. What kind of salt?—Liverpool.

16. Quantity of salt used per 100 lbs. curd?—2½ lbs.

17. Was curd ground, and how many times?—Not ground.

18. Was curd salted previous to grinding?—No.

19. Describe treatment in curing room, temperature, ventilation, &c.?—Cheese turned and rubbed once a day; ventilation through basement; temperature between 60 and 70 degrees.

CLASS A—ELEVENTH PRIZE.

1. Name of Factory?—Springford.

2. Name of Exhibitor and P.O.?—F. C. Austice, Springford.

3. Name of maker?—W. Gillard.
4. Date of each cheese shown?—August 8, 15, 20 and 30 ; September 3 and 11.
5. The ordinary milk of how many patrons was used in making these cheese?—Forty.
6. Were these cheese made by using night's and morning's milk?—Yes.
7. If made twice per day was the milk cooled before setting?—Made once a day.
8. Temperature of milk at setting?—84 degrees.
9. Describe method of cutting curds?—Cut length ways and cross ways with perpendicular knife ; let it stand untill the whey begins to show, then cut with horizontal knife.
10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. From one to three hours.
11. Is the curd soured before dipping?—Yes.
12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron.
13. What kind of rennets were used?—Imported rennets.
14. What kind of annatto was used?—Mitchell's.
15. What kind of salt?—Liverpool Factory Filled.
16. Quantity of salt used per 100 lbs. curd?—2½ lbs.
17. Was curd ground, and how many times?—Not ground.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Cheese turned and rubbed every day ; temperature about 70 degrees ; ventilated by holes in floor.

CLASS A—TWELFTH PRIZE.

1. Name of Factory?—Rimph's.
2. Name of Exhibitor & P.O.?—Jerome Rimph, Tilsonburg.
3. Name of maker?—Jerome Rimph.
4. Date of each cheese shown?—August 8, 15, 21 and 28 ; September 6 and 10. As near as I can tell as cheese was not dated. I keep a weekly record of cheese made.
5. The ordinary milk of how many patrons was used in making these cheese?—Twenty.
6. Were these cheese made by using night's and morning's milk?—Each milking made by itself.
7. If made twice per day was the milk cooled before setting? Night's milk cooled and made in the morning ; morning's milk not cooled.
8. Temperature of milk at setting?—80 to 84 degrees.
9. Describe method of cutting curds?—Cut length ways and cross ways with perpendicular knife.

10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. Time varies according to age of milk.
11. Is curd soured before dipping?—Soured.
12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron.
13. What kind of rennets were used?—Patron's.
14. What kind of annatto was used?—Mitchell's.
15. What kind of salt?—Canadian.
16. Quantity of salt used per 100 lbs. curd?—2½ lbs.
17. Was curd ground, and how many times?—Not ground.
18. Was curd salted previous to grinding?—Salted and not ground.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Cheese on benches turned every day for two weeks, then every other day; ventilation from floor; curing house 2½ feet from ground; temperature varies with the weather; keep no record of heat.

CLASS A—THIRTEENTH PRIZE.

1. Name of Factory?—Brucefield.
2. Name of Exhibitor & P.O.?—E. & J. Hickson, Seaforth.
3. Name of Maker?—William Ingram.
4. Date of each Cheese shown?—August 6, 12, 23 and 26; September 4 and 12.
5. The ordinary milk of how many patrons was used in making these cheese?—One hundred and twenty-five.
6. Were these cheese made by using night's and morning's milk?—Made of night's and morning's milk.
7. If made twice per day was the milk cooled before setting?—Made once per day.
8. Temperature of milk at setting?—82 to 84 degrees.
9. Describe method of cutting curds?—Cut lengthways with perpendicular knife, and let stand until the whey raised enough to cover the curd, then cut with same knife cross ways, and cut lengthways with horizontal knife once.
10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. Two and a half to three hours.
11. Is curd soured before dipping?—Soured before dipping.
12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron, taste and smell.
13. What kind of rennets were used?—Canadian.
14. What kind of annatto was used?—Nicholl's.
15. What kind of salt?—Canadian Extra Dairy, Clinton Cnt., Filled.

16. Quantity of salt used per 100 lbs. curd?— $2\frac{1}{2}$ lbs.
17. Was curd ground, and how many times?—Not ground.
18. Was curd salted previous to grinding?—Not ground.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Turn every day, and rubbed and greased when they needed it; temperature at or near 70 degrees. Ventilated through floor and roof. Heated by a furnace underneath.

CLASS A—FOURTEENTH PRIZE.

1. Name of Factory?—West Nissouri.
2. Name of Exhibitor and P.O.?—Thos. Bedggood, Evelyn.
3. Name of maker?—Joseph Parson.
4. Date of each cheese shown?—August 5, 9, 22 and 28; September 4 and 11.
5. The ordinary milk of how many patrons was used in making these cheese?—Eighty.
6. Were these cheese made by using night's and morning's milk?—The August cheese was made of either morning's or evening's milk. The September cheese was mixed.
7. If made twice per day was the milk cooled before setting?—Partially cooled.
8. Temperature of milk at setting?—84 degrees.
9. Describe method of cutting curds?—First length ways, then cross ways, then with a horizontal knife.
10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. One hour and a half.
11. Is curd soured before dipping?—Yes.
12. What tests or means are used to ascertain when curds are ready for dipping?—The hot iron.
13. What kind of rennets were used?—Bavarian Rennets.
14. What kind of annatto was used?—Mitchell's.
15. What kind of salt?—Goderich.
16. Quantity of salt used per 100 lbs. curd?— $2\frac{1}{2}$ lbs.
17. Was curd ground, and how many times?—Ground once in August; not ground in September.
18. Was curd salted previous to grinding?—No.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Turned and rubbed daily; temperature about 65 degrees; ventilated through the roof.

CLASS A—FIFTEENTH PRIZE.

1. Name of Factory?—Oak Grove.
2. Name of Exhibitor and P. O.?—Christian Schragg, New Hamburg, P. O.

3. Name of maker?—Alex. Wood, of Branchton.
4. Date of each cheese shown?—August 2, 9, 16 and 23; September 6 and 13.
5. The ordinary milk of how many patrons was used in making these cheese?—Seventy.
6. Were these cheese made by using night's and morning's milk?—Yes.
7. If made twice per day was the milk cooled before setting?—Made once per day.
8. Temperature of milk at setting?—82 degrees.
9. Describe method of cutting curds?—Twice with perpendicular and twice with horizontal; let stand a small space of time between each cutting.
10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. From $\frac{1}{2}$ to $2\frac{1}{2}$ hours.
11. Is curd soured before dipping?—Yes.
12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron and taste.
13. What kind of rennets were used?—Bavarian.
14. What kind of annatto were used?—Mitchell's.
15. What kind of salt?—Seaforth.
16. Quantity of salt used per 100 lbs. curd?—2 7-10 lbs.
17. Was curd ground, and how many times?—Not ground.
18. Was curd salted previous to grinding?—Salted according to acidity.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Turned and rubbed once per day; temperature as near 70 degrees as possible; ventilated by windows.

CLASS A—SIXTEENTH PRIZE.

1. Name of Factory?—Avonbank.
2. Name of Exhibitor & P.O.?—John Clyne, Avonbank.
3. Name of Maker?—George M. Harris.
4. Date of each Cheese shown?—August 8, 15, 20 and 27; September 2 and 10.
5. The ordinary milk of how many patrons was used in making these cheese?—Eighty-five.
6. Were these cheese made by using night's and morning's milk?—Yes.
7. If made twice per day was the milk cooled before setting?—Made once per day. Milk cooled to 75 degrees.
8. Temperature of milk at setting?—84 degrees.
9. Describe method of cutting curds?—With perpendicular and horizontal knives.

10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. From three to four hours.
11. Is curd soured before dipping?—Slightly acid.
12. What tests or means are used to ascertain when curds are ready for dipping?—By taste and smell; sometimes hot iron.
13. What kind of rennets were used?—C. P. Rennets.
14. What kind of annatto was used?—Mitchell's Annatto.
15. What kind of salt?—Factory filled.
16. Quantity of salt used per 100 lbs. curd?—2½ lbs.
17. Was curd ground, and how many times?—Not ground.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Ventilated from lower floor through the roof. Cheese turned once per day. Temperature kept at 70 degrees as near as possible.

CLASS B—FIRST PRIZE.

1. Name of Factory?—Verschoyle Dairy.
2. Name of Exhibitor and P.O.?—John Corrie, Culloden.
3. Name of maker?—Isabella Corrie.
4. Date of each cheese shown?—August 6, 8, and 11.
5. The ordinary milk of how many patrons was used in making these cheese?—No patrons. Milk from twenty cows.
6. Were these cheese made by using night's and morning's milk?—Night and morning's milk mixed together.
7. If made twice per day was the milk cooled before setting?—Only made once per day.
8. Temperature of milk at setting?—60 ° near as possible.
9. Describe method of cutting curds?—Cut each way; let stand fifteen minutes, then cut fine as possible.
10. Highest temperature of scalding curd, and time required in scalding?—100 degrees. One hour required in scalding.
11. Is curd soured before dipping?—A little acid just beginning to sour.
12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron.
13. What kind of rennets were used?—Of our own curing.
14. What kind of annatto was used?—Mitchell's Fluid Annatto, bought from E. Casswell.
15. What kind of salt?—Goderich.
16. Quantity of salt used per 100 lbs. curd?—2½ lbs of salt to one thousand pounds of milk.
17. Was curd ground, and how many times?—Ground once.
18. Was curd salted previous to grinding?—Yes, we always salt before grinding.

19. Describe treatment in curing room, temperature, ventilation, &c.?—Curing room 16x16, two windows, holes in the floor; ventilator on top; temperature as cool as we can get it in hot weather.

CLASS B—SECOND PRIZE.

2. Name of Exhibitor and P. O.?—Robert Ballantyne, Sebringville.

3. Name of maker?—Robert Ballantyne.

4. Date of each cheese shown?—August.

5. The ordinary milk of how many patrons was used in making these cheese?—Twenty cows.

6. Were these cheese made by using night's and morning's milk?—Yes.

7. If made twice per day was the milk cooled before setting?—Night's milk cooled.

8. Temperature of milk at setting?—82 degrees.

9. Describe method of cutting curds?—Perpendicularly and horizontally.

10. Highest temperature of scalding curd, and time required in scalding?—96 degrees. About three hours.

11. Is the curd soured before dipping?—Yes.

12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron.

13. What kind of rennets were used?—English rennets.

14. What kind of annatto was used?—Mitchell's.

15. What kind of salt?—Liverpool Factory Filled.

16. Quantity of salt used per 100 lbs. curd?—2½ lbs.

17. Was curd ground, and how many times?—No.

18. Was curd salted previous to grinding?—No.

19. Describe treatment in curing room, temperature, ventilation, &c.?—Near as possible about 70° and turned every day.

CLASS B—THIRD PRIZE.

2. Name of Exhibitor & P.O.?—John Rowat, Nilestown.

3. Name of maker?—John Rowat.

4. Date of each cheese shown?—September 1, 6 and 10.

6. Were these cheese made by using night's and morning's milk?—Yes.

7. If made twice per day was the milk cooled before setting?—Cooled before setting.

8. Temperature of milk at setting?—82 to 84 degrees.

9. Describe method of cutting curds?—Cut length ways and cross ways of the vat.

10. Highest temperature of scalding curd, and time required in scalding?—98 to 100 degrees. From two to three hours.
11. Is curd soured before dipping?—Soured before dipping.
12. What tests or means are used to ascertain when curds are ready for dipping?—By applying it to a hot iron, it will draw out in fibers.
13. What kind of rennets were used?—Butchers.
14. What kind of annatto was used?—Mitchell's.
15. What kind of salt?—Goderich.
16. Quantity of salt used per 100 lbs. curd?— $2\frac{1}{2}$ lbs.
17. Was curd ground, and how many times?—Not ground.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Turned & rubbed once a day; ventilated by windows.

CLASS D—FIRST PRIZE.

1. Name of Factory?—Cambelton Factory.
2. Name of Exhibitor & P.O.?—Adam Bell, Tilsonburg.
3. Name of Maker?—Adam Bell.
4. Date of each Cheese shown?—August 4, 5; Sept. 4, 5.
5. The ordinary milk of how many patrons was used in making these cheese?—Fifty-two.
6. Were these cheese made by using night's and morning's milk?—Yes, they were.
7. If made twice per day was the milk cooled before setting?—Only made once per day.
8. Temperature of milk at setting?—84 degrees.
9. Describe method of cutting curds?—Cut lengthways and let settle about ten minutes, and cut cross ways; then length ways again with perpendicular knife.
10. Highest temperature of scalding curd, and time required in scalding?—96 degrees. One hour and a half.
11. Is curd soured before dipping?—Yes.
12. What tests or means are used to ascertain when curds are ready for dipping?—The hot iron.
13. What kind of rennets were used?—Canadian Rennets.
14. What kind of annatto was used?—Mitchell's Annatto.
15. What kind of salt?—Factory filled for August and barrel for September.
16. Quantity of salt used per 100 lbs. curd?— $2\frac{1}{2}$ lbs.
17. Was curd ground, and how many times?—Ground once.
18. Was curd salted previous to grinding?—Salted after.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Turned and rubbed once per day; temperature about 65 degrees as near as possible.

CLASS D—SECOND PRIZE.

1. Name of Factory?—Mt. Elgin Union.
2. Name of Exhibitor and P.O.?—Mm. Tripp, Mt. Elgin.
3. Name of maker?—James Ireland.
4. Date of each cheese shown?—August 4, 5; Sept. 4, 5.
5. The ordinary milk of how many patrons was used in making these cheese?—Nineteen patrons.
6. Were these cheese made by using night's and morning's milk?—Yes.
7. If made twice per day was the milk cooled before setting?—Made once per day.
8. Temperature of milk at setting?—84 degrees.
9. Describe method of cutting curds?—Old perpendicular knife length ways and cross ways.
10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. One to three hours.
11. Is curd soured before dipping?—Yes.
12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron.
13. What kind of rennets were used?—Canadian Farm.
14. What kind of annatto was used?—Mitchell's.
15. What kind of salt?—Liverpool Factory Filled.
16. Quantity of salt used per 100 lbs. curd?—2½ lbs.
17. Was curd ground, and how many times?—not ground.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Greased when taken in, turned and rubbed once per day; temperature 72 degrees; ventilation by windows.

CLASS D—THIRD PRIZE.

1. Name of Factory?—Wyoming.
2. Name of Exhibitor and P.O.?—J. E. Anderson, Wyoming.
3. Name of maker?—John E. Anderson.
4. Date of each cheese shown?—August. 4, 5; Sept. 4, 5.
5. The ordinary milk of how many patrons was used in making these cheese?—Twenty-seven.
6. Were these cheese made by using night's and morning's milk?—Yes.
8. Temperature of milk at setting?—84 degrees.
9. Describe method of cutting curds?—Cut lengthways, stand fifteen minutes, cut cross ways twice.
10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. 50 to 80 minutes.
11. Is the curd soured before dipping?—Yes.

12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron and taste.
13. What kind of rennets were used?—Irish.
14. What kind of annatto was used?—Mitchell's Liquid.
15. What kind of salt?—Goderich.
16. Quantity of salt used per 100 lbs. curd?— $2\frac{1}{2}$ to $2\frac{3}{4}$ lbs.
17. Was curd ground, and how many times?—Ground once.
18. Was curd salted previous to grinding?—Yes.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Turned and rubbed daily; temperature 70 to 80 degrees; ventilated by windows.

CLASS E—FIRST PRIZE.

1. Name of Factory?—Woodstock.
2. Name of Exhibitor & P.O.?—G. V. DeLong, Woodstock.
3. Name of maker?—G. V. DeLong, Jr.
4. Date of each cheese shown?—August 11, 12; Sept 1, 2.
5. The ordinary milk of how many patrons was used in making these cheese—Sixty.
6. Were these cheese made by using night's and morning's milk?—Yes.
8. Temperature of milk at setting?—82 to 84 degrees.
9. Describe method of cutting curds?—Cut with perpendicular knife.
10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. From 1 to $1\frac{1}{2}$ hours.
11. Is curd soured before dipping?—Yes.
12. What tests or means are used to ascertain when curds are ready for dipping?—By means of hot iron
13. What kind of rennets were used?—C. P. Rennets.
14. What kind of annatto were used?—Mitchell's.
15. What kind of salt?—Common Barrel Salt.
16. Quantity of salt used per 100 lbs. curd?—2 7-10 lbs.
17. Was curd ground, and how many times?—Not ground.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Rubbed and turn once a day; ventilated through the floor and roof.

CLASS E—SECOND PRIZE.

1. Name of Factory?—Springford.
2. Name of Exhibitor and P.O.?—F. C. Austice.
3. Name of maker?—W. Gillard.
4. Date of each cheese shown?—August 11 and 12; September 1 and 2.

5. The ordinary milk of how many patrons was used in making these cheese?—Forty.

6. Were these cheese made by using night's and morning's milk?—Yes.

7. If made twice per day was the milk cooled before setting?—Made once a day.

8. Temperature of milk at setting?—84 degrees.

9. Describe method of cutting curds?—Cut length ways and cross ways with perpendicular knife, and let it stand until the whey shows, then cut with horizontal knife.

10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. From one to three hours.

11. Is curd soured before dipping?—Yes.

12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron.

13. What kind of rennets were used?—Imported Rennets.

14. What kind of annatto was used?—Mitchell's.

15. What kind of salt?—Liverpool Factory Filled.

16. Quantity of salt used per 100 lbs. curd?—2½ lbs.

17. Was curd ground, and how many times?—Not ground.

19. Describe treatment in curing room, temperature, ventilation, &c.?—Cheese turned and rubbed every day; temperature about 70 degrees; ventilated by holes in the floor.

CLASS E—THIRD PRIZE.

1. Name of Factory?—Middleton and Bayham.

2. Name of Exhibitor and P.O.?—O. P. Mabey, Tilsonburg.

3. Name of maker?—Joseph Dickinson.

4. Date of each cheese shown?—August 11 and 12; September 1 and 2.

5. The ordinary milk of how many patrons was used in making these cheese?—About Forty.

6. Were these cheese made by using night's and morning's milk?—Yes, drawn once a day.

7. If made twice per day was the milk cooled before setting?—Not made twice.

8. Temperature of milk at setting?—82 degrees.

9. Describe method of cutting curds?—Length ways and cross ways, then brake gently with hand.

10. Highest temperature of scalding curd, and time required in scalding?—94 degrees. One hour.

11. Is curd soured before dipping?—No.

12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron and taste.

13. What kind of rennets were used?—American.
14. What kind of annatto was used?—Annottoine.
15. What kind of salt?—Goderich.
16. Quantity of salt used per 100 lbs. curd?—2 7-10 lbs.
17. Was curd ground, and how many times?—No.
18. Was curd salted previous to grinding?—No.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Turned and rubbed once per day; temperature 65 to 70 degrees

CLASS F—FIRST PRIZE.

1. Name of Factory?—Seaforth.
2. Name of Exhibitor & P.O.?—John Chisholm, Seaforth.
3. Name of maker?—John Chisholm.
4. Date of each cheese shown?—August 27 and 29; September 2 and 5.
5. The ordinary milk of how many patrons was used in making these cheese?—One hundred.
6. Were these cheese made by using night's and morning's milk?—Yes.
8. Temperature of milk at setting?—83 degrees.
9. Describe method of cutting curds?—First with perpendicular, and contra wise with the same, once with horizontal.
10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. Two hours and a half.
11. Is curd soured before dipping?—Yes.
12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron.
13. What kind of rennets were used?—English Rennets.
14. What kind of annatto were used?—Mitchell's Annatto.
15. What kind of salt?—Clinton refined.
16. Quantity of salt used per 100 lbs. curd?—2½ lbs.
17. Was curd ground, and how many times?—Yes, once.
18. Was curd salted previous to grinding?—Yes.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Turn and rubbed daily; temperature 55 to 75 degrees; well ventilated in sealing.

CLASS F—SECOND PRIZE.

1. Name of Factory?—Ontario.
2. Name of Exhibitor and P.O.?—H. S. Losee, Norwich.
3. Name of maker?—H. S. Losee.
4. Date of each cheese shown?—August 21 and 29; September 2 and 5.

5. The ordinary milk of how many patrons was used in making these cheese?—Sixty.

6. Were these cheese made by using night's and morning's milk?—Yes.

7. If made twice per day was the milk cooled before setting?—Not made twice per day.

8. Temperature of milk at setting?—82 to 84 degrees.

9. Describe method of cutting curds?—First check curd with perpendicular knife, when ready to apply heat cut length ways with horizontal knife.

10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. One hour.

11. Is curd soured before dipping?—Yes.

12. What tests or means are used to ascertain when curds are ready for dipping?—Taste and hot iron.

13. What kind of rennets were used?—C. P. and patrons.

14. What kind of annatto was used?—Mitchell's.

15. What kind of salt?—Liverpool.

16. Quantity of salt used per 100 lbs. curd?—2 7-10 lbs.

17. Was curd ground, and how many times?—Not ground.

18. Was curd salted previous to grinding?—No.

19. Describe treatment in curing room, temperature, ventilation, &c.?—Turned cheese every day; temperature from 70 to 80 degrees; ventilated up through bottom floor, up through the roof.

CLASS G—FIRST PRIZE.

1. Name of Factory?—Ontario.

2. Name of Exhibitor and P.O.?—H. S. Losee, Norwich.

3. Name of maker?—H. S. Losee.

4. Date of each cheese shown?—August 2 and 6; September 2 and 6.

5. The ordinary milk of how many patrons was used in making these cheese?—Sixty.

6. Were these cheese made by using night's and morning's milk?—Yes.

7. If made twice per day was the milk cooled before setting?—Not made twice a day.

8. Temperature of milk at setting?—82 to 84 degrees.

9. Describe method of cutting curds?—First check curd with perpendicular knife, when ready to apply heat, cut length ways with horizontal knife.

10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. One hour.

11. Is curd soured before dipping?—Yes.

12. What tests or means are used to ascertain when curds are ready for dipping?—Taste and hot iron.
13. What kind of rennets were used?—C. P. and Patrons.
14. What kind of annatto was used?—Mitchell's.
15. What kind of salt?—Liverpool.
16. Quantity of salt used per 100 lbs. curd?—2 7-10 lbs.
17. Was curd ground, and how many times?—Not ground.
18. Was curd salted previous to grinding?—No.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Turned cheese every day; temperature 60 to 80 degrees; ventilated up through bottom floor, up through the roof.

CLASS G—SECOND PRIZE.

1. Name of Factory?—Fullarton Cheese Factory.
2. Name of Exhibitor & P.O.?—William Huxley, Ingersoll.
3. Name of Maker?—William Huxley.
4. Date of each Cheese shown?—Aug. 2 & 6; Sept. 2 & 6.
5. The ordinary milk of how many patrons was used in making these cheese?—One hundred and seven.
6. Were these cheese made by using night's and morning's milk?—Yes.
7. If made twice per day was the milk cooled before setting?—Yes.
8. Temperature of milk at setting?—84 degrees.
9. Describe method of cutting curds?—Perpendicular knife twice and horizontal once.
10. Highest temperature of scalding curd, and time required in scalding?—98 degrees. One to three hours.
11. Is curd soured before dipping?—Yes.
12. What tests or means are used to ascertain when curds are ready for dipping?—Hot iron and smell.
13. What kind of rennets were used?—English and Patrons.
14. What kind of annatto was used?—Mitchell's Fluid.
15. What kind of salt?—Liverpool Factory Filled.
16. Quantity of salt used per 100 lbs. curd?—2 to 2½ lbs., according to acid.
17. Was curd ground, and how many times?—Only ground sometimes, when required.
18. Was curd salted previous to grinding?—No.
19. Describe treatment in curing room, temperature, ventilation, &c.?—Taken care of as well as could be under circumstances; ventilated through floor and windows.

CONDENSED REPORT.

The following Table gives the Names of all Factories, with their P. O. Address, from which we have received reports, together with the No. of Cheese Made, Average Weight, No. of In. in Diameter, No. of lbs. of Cheese Made, and No. of Cows represented at each Factory.

NAME OF FACTORY.	POST OFFICE.	No. of cheese made.	Average weight.	No. in. Diam't.	No. lbs. of Cheese made.	No. of Cows.
Ayer	Aultville	1500	43	13	63,000	300
Avonbank	Avonbank	1532	65	15	101,532	400
Avon	Avon	2161	74	16	161,657	.....
Allan's Settlement	Ma. oc	1424	73	16	103,846	320
Allangrove	River Raisin	1000	70	15½	70,000	275
Ashleys	Foxboro	1614	61	15½	98,435	315
Anvern	Fairfield, East	1475	63	16	92,925	320
Addington	Newburgh	1700	64	15½	110,927	375
Addison	Addison	1600	62	14	92,230	400
Bastard	New Boyne	881	62	15	54,600	270
Brownsville	Brownsville	7348	71	16	521,655	1,500
Burgersville	Norwich	1629	69	16	113,321	460
Beaver	Gananoque	1600	65	15½	104,000	500
Brucefield	Seaforth	2500	.....	.....	160,000	.....
Brands	Forest	415	70	16	23,096	100
Bogart	Tweed	690	66	16	45,000	138
Bloomfield	Bloomfield	1673	69	16	115,272	375
Brae	Barnbrae	1172	64	15½	75,031	238
Burnside	Putnam	710	69	16	49,376	.....
Black Creek	Pictou	258	71	15	18,320	70
Brodies	Belleville	453	62	15	28,090	90
Balderson	Balderson	1500	65	15½	97,700	400
Beaver	Lansdowne	1800	67	15	120,600	500
Burritt's Rapids	Burritt's Rapids	2500	.....	16	.....	50
Buell's Mills	Brockville	1000	60	15	60,000	300
Cherry Valley	Pictou	1712	69	16	19,440	455
Cranache	Dundonald	1164	69	16	81,013	375
Cromarty	Cromarty	1450	65	16	91,433	500
Clinton	Clinton	1453	57	15	72,823	500
Caistorville	Caistorville	773	65	16	50,253	183
Crystal Fountain	Greenbush	2000	65	15½	130,000	500
Crystal Spring	Toledo	1200	55	14	66,000	225
Clayton	Balderson	1500	60	14	90,000	400
Clear Lake	Forfar	1200	60	15½	72,000	233
Clovervale	Frankville	1500	60	14	90,000	300
Cherry Ridge	Newboro	900	65	15½	58,000	250
Charleyville	Prescott	1000	65	15	65,000	300
Culloden	Culloden	3126	75½	.....	236,436	.....
Caintown	Caintown	1800	68	15	122,400	400
Cedar Spring	Farmersville	2250	55	14	121,000	500
Dulsmare	Lansdowne	1350	60	14½	81,000	300
Diamond	Delta	1400	60	15	84,000	300
Dickinson's Landing	Wales	1500	60	15	90,000	300
Dominion	Frankville	1500	60	14	90,000	300
Dominion	Elgin	1500	60	14	90,000	300
Dexter	Chantry	1350	60	14	81,000	300
East Zorra	Innerkip	3885	70	16	272,000	930
Elzivir	Queensboro	785	66½	16	52,195	175
Ellerslie	Gananoque	1331	63	14	83,876	300
Easton	Easton's Corners	1800	55	14	99,000	450

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CONDENSED REPORT.—Continued.

No. of Cows.	NAME OF FACTORY.	POST OFFICE.	No. of cheese made.	Average weight.	No. in Diam'r.	No. lbs. of Cheese made.	No. of Cows.
300	Escott.....	Escott.....	1600	67	15	107,200	400
400	Fall Springs.....	Lansdowne.....	1500	66	15	99,000	350
	Front Sidney.....	Sidney.....	4751	67	16	318,317	1000
320	Fullarton.....	Fullarton.....	2029	64	15	131,319	500
275	Farmer's Own.....	Delta.....	1200	60	14½	72,000	200
315	Forfar.....	Forfar.....	1500	64	14½	96,000	350
320	Farmersville.....	Farmersville.....	2250	52	14	117,000	500
575	Farmersville.....	Farmersville.....	2000	58	14½	116,000	400
400	Golden.....	Eldorado.....	1426	68	16	98,282	310
270	Grams.....	Derwent.....	1629	76	16	78,702	250
1,500	Gore.....	Ingersoll.....	705	73	16½	53,279	180
400	Greenbush.....	Greenbush.....	1600	65	15½	104,000	500
500	Glentay.....	Perth.....	1500	75	15	112,500	400
	Golden Spring.....	Farmersville.....	2200	55	14	121,000	400
100	Hungerford.....	Tweed.....	1606	64	16	102,776	316
138	Halloway.....	Belleville.....	3683	65	15	239,433	800
375	Henderson's.....	Ingersoll.....	1001	70	16	70,072	300
238	Hawkesbury.....	Hawkesbury.....	800	52	14	42,352	200
	Harrietsville.....	Harrietsville.....	3975	76	16	302,011	1000
	Hunter.....	Smith's Falls.....	1500	65	15	97,500	400
70	Junctown.....	Mallorytown.....	1600	69	15½	110,400	340
90	Island Dale.....	Ernestown.....	860	50	14	43,000	215
400	Innisfill.....	Carlton Place.....	1500	50	13	75,000	300
500	Kerwood.....	Kerwood.....	4403	70	16	308,210	900
50	Keays.....	Balderson.....	1200	60	14	72,000	300
300	Leeds.....	New Boyne.....	881	55	14	48,455	250
455	Lawson's.....	Salford.....	2414	69	16	167,168	570
375	Londesborough.....	Clinton.....	1906	60	15	112,210	350
500	Lansdowne.....	Lansdowne.....	2000	65	15½	130,000	450
500	Lombardy.....	Lombardy.....	2000	73	16	150,000	500
183	Melrose.....	Melrose.....	1422	69	16	98,399	313
500	Mineral Spring.....	Pictou.....	1150	64	15	73,272	245
225	Mountain View.....	Mountain View.....	835	60	15	50,517	200
400	Mariposa.....	Oakwood.....	1150	62	15½	71,313	300
236	Mills Spring.....	Sparta.....	530	74	16½	39,283	150
300	Mariposa, 7th Line.....	Oakwood.....	432	63	15	27,234	100
250	Maitland.....	Auburn.....	1100	58	15½	63,229	400
300	Milverton.....	Milverton.....	1105	70	16	77,319	400
	Mt. Elgin.....	Mt. Elgin.....	1985	74	16½	148,343	450
400	Maple Grove.....	Strathallan.....	1244	73	16	91,252	300
500	Maple Grove.....	Gananoque.....	373	63	15	23,473	100
300	Maple Grove.....	Algonquin.....	1300	67	15½	87,100	300
300	Mallorytown.....	Mallorytown.....	1800	65	15	117,000	430
300	Napanee.....	Napanee.....	1100	47	15	51,700	250
300	Newburgh.....	Newburgh.....	2478	62	15½	153,664	625
300	Newboro.....	Wesport.....	1000	57	14½	57,000	200
930	North Augusta.....	North Augusta.....	1000	57	14½	57,000	400
175	McNish.....	Escott.....	70	15			100
300	Oxford Mills.....	Oxford Mills.....	70	15			350
450	Oxford.....	Norwich.....	2000	68	16	137,136	500
	Otterville.....	Otterville.....	242	66	16	16,001	53

CONDENSED REPORT.—Continued.

NAME OF FACTORY.	POST OFFICE.	No. of cheese made.	Average weight.	No. in Dian'r.	No. lbs. of Cheese made.	No. of Cows.
Pioneer.....	Washington.....	1300	70	16	84,000	280
Pine Hill.....	West Flamboro.....	1408	70	16	98,560	330
Platts.....	Adolphustown.....	1743	56	15½	97,610	360
Pine Grove.....	Lyndhurst.....	900	70	15	63,000	300
Portland.....	Forfar.....	1500	64	14½	96,000	350
Poole.....	Forfar.....	750	68	15½	71,000	170
Powell.....	Plum Hollow.....	1000	57	14	57,000	180
Phillipsville.....	Phillipsville.....	3000	65	15½	195,000	600
Quaban.....	Escott.....	800	70	15½	56,000	200
Queen.....	Farmersville;.....	1190	50	13½	59,065	225
Red Clover.....	Farmersville.....	1936	55	14	105,838	450
Richies.....	Inverary.....	353	59	15	20,815	90
Robblin.....	Roblin.....	900	43	13	39,357	150
Riverside.....	Prescott.....	420	63	16	26,460	150
Rockford.....	Vittoria.....	1686	70	16	118,020	400
Rymphs.....	Tilsonburg.....	790	72	16	56,880	200
Roseville.....	Farmersville.....	2000	65	15½	130,000	500
Rockspring.....	White Hurst.....	1500	60	14	90,000	300
Rockdale.....	Caintown.....	1400	55	14	66,000	350
Royal Dominion.....	New Dublin.....	.....	70	15	.....	300
Summersville.....	Otterville.....	775	70	16	54,250	250
Silver Springs.....	Gananoque.....	1214	70	15	84,980	300
Spring Creek.....	Vanleek Hill.....	772	65	14	50,080	300
Sagers.....	Troy.....	1245	75	16	93,383	250
Spring Grove.....	Henry.....	900	64	15	75,000	275
Springfield.....	Springfield.....	1462	76	16½	111,853	372
Springfield.....	.....	248	65	15	16,244	.....
Spring Vale.....	Lyndhurst.....	1200	65	14½	80,000	350
Sidney.....	Belleville.....	1100	65	15½	72,150	240
Silver Bank.....	Farmersville.....	1600	60	15½	96,384	400
Salem.....	Westport.....	1300	65	15½	84,500	250
Starr.....	Lynn.....	3000	67	15	201,000	600
Smith's Falls.....	Smith's Falls.....	1500	65	15½	97,500	400
Sherwood Spring.....	Caintown.....	.....	56	14	.....	250
Silver Spring.....	Lynn.....	1500	65	15½	97,500	325
Storeys.....	Escott.....	1000	65	15½	65,000	250
Spring Valley.....	Perth.....	.....	65	15	.....	450
Thurlow.....	Belleville.....	1200	66	15½	79,260	255
Thomasburg.....	Thomasburg.....	2150	71	16	152,644	465
Thompson.....	Arkona.....	682	76	16	51,858	176
Tuttle Spring.....	Lynn.....	1200	64	15½	76,800	325
Union.....	Cannifton.....	2444	69	15½	169,016	520
Victoria.....	Tweed.....	2022	72	16	144,190	475
Wellington.....	Wellington.....	1010	68	16	69,421	.....
Webbs.....	Ridgetown.....	900	70	16½	63,000	300
Warkworth.....	Warkworth.....	908	69	16	62,692	280
West Huntingdon.....	West Huntingdon.....	1602	65	15½	104,129	314
White Clover.....	Farmersville.....	1835	52	14	94,907	400
West Magdala.....	West Magdella.....	1093	72	16	78,713	220
Wilton.....	Wilton.....	928	59	15	54,576	280
Wilton.....	Newburg.....	913	60	15	54,756	275

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And every other article required in the dairy, in Best Qualities and Styles, and
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	Ashton Salt.	Onon. Fac. Filled.
Chloride of Sodium.....	97.65	98.28
Sulphate of Lime.....	1.43	0.91
Sulphate of Magnesia.....	0.05	.06
Chlo ide of Magnesia.....	0.06	.00
Sulphate of Soda.....	.00	.03
Insoluble Matter.....	.05	.12
Water.....	.76	.60
	100.00	100.00

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 AND SUPPLIED BY
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Sent to all Parts of Canada by Express or Mail.

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|--|---|
| <p>Dominion Milk Book and Ledger, shows Weekly and Monthly Totals.
 Milk Pass Books, with Rules for Patrons.
 Set of Testing Instruments, consisting of three graduated Glass Jars and Lactometer, with instructions how to use them.
 Comparison Tubes.
 Annatto Measures—2 and 4 oz.
 Lactometers, graduated for milk at 60° and 80° Temperature.
 Floating Thermometers.
 Thermometers, Nickle—new patent.
 Teat Syphons, German silver, which draw milk from cows with sore teats, or hard to milk, without pain.
 Concealed Bistories, finest steel, for cutting inside of cows' teats.
 WILLARD'S PRACTICAL DAIRY HUSBANDRY—Just Issued, \$3.
 Hints on Cheese-making.
 Monthly Receiving Sheets.
 Stencil Plates, Months and Dates, set of 43 pieces.
 Stencil Plates, $\frac{3}{4}$ in. letter, full alphabet.</p> | <p>Stencil Plates, $\frac{3}{4}$ in. figures.
 Stencil Paste, with Paste Cup, Sponge and Brush.
 Extra Cakes of Paste.
 Factory Brands (brass) any description.
 Nickel Plated Cheese Triers, 4$\frac{1}{2}$ inches long.
 Curd Knives, made of the finest steel, and tinned over, perpendicular and horizontal—all sizes.
 Rubber Mops—best article in use for cleaning floors.
 Rubber Rings, preventing the curd from pressing up between follower and hoop.
 Wood Rings, preventing the curd from pressing up between follower and hoop.
 Factory Slates.
 Stationery, &c.—all kinds.
 <i>Canada Farmer</i>—\$1.50 per year.
 <i>Ingersoll Chronicle</i>—\$1.50 per year.
 <i>Little Falls Journal</i>—\$2.20 per year.
 <i>Utica Herald</i>—2.20 per year.
 <i>Rural New Yorker</i>—\$2.20 per year.
 <i>American Agriculturist</i>—\$1.50 per year.</p> |
|--|---|

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