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Eleventh annual meeting of the Wisconsin Cheese Makers' Association held in the Convention Rooms, Republican House, Milwaukee, Wisconsin, Wednesday, Thursday and Friday, January 7, 8 and 9, 1903. 190...

Wisconsin Cheese Makers' Association
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ELEVENTH ANNUAL MEETING

OF THE

WISCONSIN

Cheese Makers' Association

HELD IN THE

Convention Rooms, Republican House, Milwaukee, Wisconsin,
Wednesday, Thursday and Friday, January
7, 8 and 9, 1903.

REPORT OF THE PROCEEDINGS, ANNUAL ADDRESS OF THE PRESIDENT, AND INTERESTING ESSAYS AND DISCUSSIONS RELATING TO THE CHEESE INTERESTS.

COMPILED BY

U. S. BAER, Secretary.

MRS. A. L. KELLY, Stenographic Reporter.

MADISON, WIS.
DEMOCRAT PRINTING CO., STATE PRINTER.
1903.

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LETTER OF TRANSMITTAL.

OFFICE OF THE SECRETARY,
WISCONSIN CHEESE MAKERS' ASSOCIATION,
MADISON, WIS., 1903.

To His Excellency, ROBERT M. LA FOLLETTE,
Governor of the State of Wisconsin:

I have the honor to submit the eleventh annual report of the Wisconsin Cheese Makers' Association, showing the receipts and disbursements the past year, also containing the papers, addresses and discussions had at the annual convention held at Milwaukee, January 7-9, 1903.

Respectfully submitted,

U. S. BAER,
Secretary.

OFFICERS, 1903.

President —

THOS. JOHNSTON.....Boaz, Wis.

Vice President —

HUGH NISBET.....Richland Center, Wis.

Directors —

Three Years — J. K. POWELL.....Stevens Point, Wis.
Two Years — F. J. KARLEN.....Monroe, Wis.
One Year — E. L. ADERHOLD.....Neenah, Wis.

Treasurer —

J. B. McCREADY.....Madison, Wis.

Secretary —

U. S. BAER.....Madison, Wis.

TABLE OF CONTENTS.

	PAGE.
Letter of Transmittal	iii
List of Officers, 1903	iv
In Memoriam —	
Thos. Johnston	vii
W. C. Dickson	ix
Articles of Incorporation	xi
Membership Wisconsin Cheese Maker's Association	xv
Program, Eleventh Annual Meeting	xxiii
Premiums, Cheese Exhibit	xxvi
Proceedings of the Convention —	
President's Annual Address, W. C. Dickson	2
Appointment of Committees	5
The Qualifications Necessary to be an Up-to-Date Cheese Maker, J. F. Bachmann	6
Care of Milk for Cheese, M. McKinnon	8
Greetings, Eastern Ontario Dairymen's Association	19
Receiving Milk at the Weigh Room, H. C. Alves	19
Preparing Starters and Ripening the Milk, Hugh Nisbit	24
Drawing Off the Whey and Handling the Curds on the Racks, F. F. Zimmerman	29
Milking, or Grinding, and Salting of the Curd, Chas Gartmann	35
Pressing and Bandaging Cheese, Chas. Pickard	38
Curing of Cheese, V. M. Scott	42
Boxing and Shipping, O. A. Kielsmeier	50
The Babcock Test and the Cheese Maker, Prof. F. W. Woll	56
Telegram, Eastern Ontario Dairymen	77
Invitation, A. J. Decker	77
Letter of Greeting, Congressman S. A. Cook	77
Telegram of Greeting, D. W. Wilson	78
Cheese Making, T. B. Miller	78
Improved Methods of Handling and Marketing the Cheese Product of Wisconsin, R. H. Odell	95
Address, Prof. J. Q. Emery	105
Resolution	109

PROCEEDINGS OF THE CONVENTION—Continued. PAGE.

The Desirable Qualities in Canadian Cheese, Prof. H. H. Dean. 109
Report of Committee on Cheese Exhibit 127
Report of Judge on Foreign Cheese, John Luchsinger 129
Method of Making Swiss Cheese, Alex. Schaller..... 130
Invitation, R. Sanford..... 133
Report of Secretary..... 134
Report of Board of Directors..... 136
Report of Treasurer 138
Report of Committee on Resolutions 142
Election of Officers 145
Women as Cheese Factory Managers and Cheese Makers, Miss M. A. Raeder..... 148
Discussion, Centralization of the Cheese Business 151
Fancy Brands of Cheese, John Luchsinger..... 160
Breeding and Rearing a Profitable Dairy Worker, Mrs. Adda F. Howie 170
Will the Acidimeter Replace the Rennet and Hot Iron Tests in Cheese Making, Prof. H. H. Dean..... 183
Presentation, Ben. Dally..... 190
Swiss Cheese Making: Methods of Manufacturing, Fred Marty. 191
How to Pay for Milk at Cheese Factories, H. Anderson..... 197
Letter of Greeting, Ex-Gov. W. D. Hoard 202
Letters of Invitation..... 203
Experience of Past Season in Cheese Making, W. H. Short..... 204

THOMAS M. JOHNSTON

Treasurer Wisconsin Cheese Makers' Association from 1893 to 1899, Member of Board of Directors from 1899 to 1903, Elected president of the Association January 8th, 1903.

In Memoriam.

THOMAS M. JOHNSTON.

THOMAS M. JOHNSTON was a native of England, born April 19th, 1866, in the town of Woolwich. He came to Canada with his parents in 1870, where his boyhood days were spent and where he receved his education. When sixteen years of age Mr. Johnston embarked in the cheese business. For several years prior to his coming to the States he managed a number of factories, of the famous D. M. McPherson line of cheese factories, at Dominionville and Apple Hill, Canada. He came to the United States in 1891, locating at Boaz, Richland county, Wisconsin, where he engaged in cheese making. He was united in marriage, in 1894, with Miss Cassie Kennedy of Apple Hill, Glengarry, Canada, who, together with a little daughter six years of age, is left to mourn. He is also survived by four brothers residing in Canada.

A husband and father is gone, never to return; a brother whose cheering counsel is forever stilled; a friend lost whose very presence breathed sunshine and hopefulness; a citizen whose influence might ever be counted for what he deemed conscientiously right, whose personality was a benefit to the town, county, and state.

By energy and push he became the leading cheese maker of the county, and finally won state and national reputation. From 1893 to 1899 he served as treasurer of the Wisconsin Cheese Makers' Association. From 1899 to 1903 he was a member of the Board of Directors and was selected president of the organization at the last annual meeting.

His death strikes singularly deep sorrow to the hearts of an extraordinary number of devoted friends. He gave such brilliant promise of even greater success than he had already won, that, without the devoted attachment which he commanded from all with whom he came in contact, his death would yet be mourned by all who are ardent for the honor of our state and our professin. His opportunities for enlarging his personal intimacies were unique; and his no-

bility of soul, his force of character, and his pervading graciousness of manner made him dear to all those who enjoyed association with him. He had a profound capacity for friendship. Absolutely candid and ingenuous himself, he never harbored suspicions of the sincerity of others. His freedom from suspicion positively compelled sincerity with him—and that always, in the end, compelled respect and affection.

He raised himself to one of the most conspicuous and honorable positions in his profession by his own efforts. H had no special advantages, no fictitious helps. His pathway was not paved with wealth nor smoothed by political and social influences.

His life was normal. There were no gaps in it; no freaks, no startling changes, no loss or degeneracy anywhere.

With all his gifts and strength of character he had a charming and direct simplicity of manner and speech. He never posed nor acted. He could not be tempted into any kind of sensationalism. He was enamored of truth, right and goodness; he loved these deeply. Truth and right were for him the attributes of God.

The news of his illness, when supposedly in the enjoyment of rugged health, was received with expressions of sympathy and sadnss; the course of the treacherous typhoid was watched with sympathetic interest; the crisis was apparently passed, and expressions of relief were seen upon every face. But the dreaded hemorrhape, understood only by those familiar with typhoid fever, came and the consequent shock to an already weakened vitality which could not be overcome; a few days' evasion of the inevitable, a hasty closing of business affairs and farewell to friends, and the end came, leaving an indefinable sorrow prevailing in home, neighborhood, community and country, a sense of loss irreparable.

Death came to him on the 5th day of March, 1903, in the thirty-fifth year of his life.

There is no severer test of a man's life than the way he faces death. He stood this last supreme test so well and bravely that in this he was perfect. Never was there seen a finer, stronger, more manly passing. Measured by years, he did not reach the allotted age of man; but reckoned by work accomplished and noble deeds performed. his was a long and useful life.

U. S. Baer.

WILLIAM C. DICKSON

MASTER STEWART DICKSON.

President Wisconsin Cheesemakers' Association from February 9th, 1900 to January 8th, 1903.

WILLIAM C. DICKSON.

WILLIAM C. DICKSON, whose death has been so widely mourned in Wisconsin, was a native of Canada, born June 19th, 1858, in the town of Cornwall, Ontario, where his boyhood days were spent and where he received his educatin. He served his apprenticeship with D. M. MacPherson, the proprietor of the world-renownd Allen Grove combination. After making cheese for three years, he was then selected as manager and instructor over seventy-eight factories and filled that position with marked ability for five years, after which time he was persuaded to follow Horace Greeley's advice to go West, and West he came, much to the regret of his employer and the makers under his control and the many patrons who sent milk to this mammoth aggregation, some of them even went so far as to insist that the Allen Grove combination would find it difficult to replace "the Colonel," as he was commonly called in the East.

He came to the United States in 1887 as the traveling representative of the A. H. Barber Manufacturing Company of Chicago, which position he held up to the time of his death.

In 1900 he was elected president of the Wisconsin Cheese Makers' Association. He served the cheese makers and dairymen of the state in this capacity for three consecutive years, refusing the honor of a fourth term tendered him last January at the Milwaukee meeting of the organization.

Mr. Dickson was married February 5, 1896, to Miss Sarah A. Trainor of Madison, Wis. After three years of wedded life Mrs. Dickson departed this world leaving the bereaved husband and a baby boy to mourn. On October 14, 1902, he was joined in marriage with Miss Lora Scott of Madison, Wisconsin.

The active disease which terminated his life run a rapid course he being ill but a few days. He had been ailing but three days when he submitted to an operation for appendicitis from the effects of which he died within a few hours. Death came to him on the 4th day of April, 1903, just a few days prior to his forty-fifth birthday. He is survived by a wife and little son, Stewart, five years of age, together with three sisters and two brothers.

Mr. Dickson loved his work. Heart, mind and soul were absorbed in it. In conversation he could hardly drift away from it. He must work, think, reason, or he could not live.

He was a leader, not by mere assertion or assumption, but by the

divine right of seeing clearly the thing to be done, and knowing best how to do it. He never seemed to be immature. His judgment was good; he was level headed. Not only in his thinking, but in his expression he was manlike. It would be a task of love to write down those little incidents, chance utterances, characteristic humors and personal traits which most endeared him to his friends, but the sense of loss bears too close upon us now, and as memory at the flood brings up chance fragments of his life, we clutch at them and hold them to our hearts.

To his personal friends his death comes as one of the hardest things of life to bear. He loved his family, his home and his friends with a tenderness and an intensity which brought back to him that which he gave. And so the enthusiasm which filled him was of the best, and was contagious because it was so warm and honest.

Gentle in his ways, strong in his affection, rich in a comprehensive charity, singularly free from the poison of malice and the folly of envy, he represented a rare Christian manhood.

All the consolations of right thinking, all the philosophy of life, all the reasoning of manly strength, says, 'stand and bear patiently, resignedly and with tender love for him who has gone.'

The following tribute of honor and respect to his memory, by the A. H. Barber Manufacturing Company of Chicago, protrays his highly esteemed character as a business man, and friend:

"For the past sixteen years Mr. W. C. Dickson has been a faithful representative of the A. H. Barber Manufacturing Company, and its predecessors. The loss to us and to his many friends is a difficult matter to xpress in words. The absolute integrity and trustworthiness of this big-hearted man could not fail to impress all who came within the sphere of his friendship.

The very long and trusted service for one firm is in itself a most rare tribute to the man, both as a man and as a business associate.

His many years of close association with the trade in Wisconsin and his several years' service as President of the Wisconsin Cheese Makers' Association won for him a host of friends. For these friends he would have done much and he did do much in spite of his untimely end. We are sure all of these friends will long remember the genial kind-hearted man whom we now mutually mourn."

U. S. Baer.

ARTICLES OF INCORPORATION

OF THE

WISCONSIN CHEESE MAKERS' ASSOCIATION.

(Adopted February 2, 1899.)

ARTICLE I.

The undersigned have associated and do hereby associate themselves together for the purpose of forming a corporation under Chapter 86 of the Wisconsin statutes of 1898 and the acts amendatory thereof and supplementary thereto, the business, purpose, and object of which corporation shall be the education of its members for better work in the art of making cheese the care and management of factories, the sale of their products and the weeding out of incompetency in the business of cheesemaking; the further object of the corporation is to demand a thorough revision and rigid enforcement of such laws as will protect the manufacture of honest dairy products against undue competition from deceitful and dangerous imitations; and to unite the rank and file of its members in instituting a regular crusade against the unjust practice of pooling milk at cheese factories by weight, without regard to the butter fat which it contains.

ARTICLE II.

This corporation shall be known as the "WISCONSIN CHEESE MAKERS' ASSOCIATION," and its principal office and location at Madison, Wisconsin.

ARTICLE III.

The association shall be a corporation without capital stock. Any person who is a practical cheesemaker, and such other persons as are directly or indirectly interested in the manufacture and sale of un-

adulterated cheese may become members of this corporation by paying one dollar annually in advance and signing the roll of membership.

ARTICLE IV.

SECTION 1. The general officers of said association shall consist of a president, vice president, secretary and treasurer, and the board of directors shall consist of three members of the association.

SECTION 2. The term of the officers of the association shall be one year, or until their successors are elected at the next annual meeting following their election and until such successors qualify. At the first meeting of the members of the association there shall be elected a director for the term of one year, a director for the term of two years, and a director for the term of three years, and thereafter there shall be elected at each annual meeting a director for the term of three years, and each director shall hold his office until his successor is elected and qualifies. The election of officers and directors shall be by ballot, except in case of a single nominee, when election by acclamation may be substituted. A majority of all the votes cast shall decide an election.

ARTICLE V.

SECTION 1. The principal duties of the president shall be to preside at all meetings of the Board of Directors and of the members of the association during his term of office. He shall appoint special committees and sign all orders drawn on the treasurer. He shall appoint a committee on resolutions and a program committee. He shall also provide for suitable medals at the expense of the association.

SECTION 2. The vice president shall assume the duties of the president in the latter's absence.

SECTION 3. The principal duties of the secretary of this association shall be to keep a complete and accurate record of the proceedings of the Board of Directors and of the association and to attend all meetings, keep a correct account of the finances received, pay all moneys into the hands of the treasurer and receive his receipt therefor, and to countersign all orders for money drawn upon the treasurer. He shall keep a record book and suitable blanks for his office. He shall make a full and complete report at each annual meeting of the correct state of the finances and standing of the association. He shall also procure certificates of membership, and every person joining the association shall receive one signed by the president and countersigned by the secretary.

SECTION 4. The principal duties of the treasurer shall be to faithfully care for all moneys entrusted to his keeping, paying out the same only on receipt of an order signed by the president and countersigned by the secretary. He shall file with the secretary of the association all bonds required by the articles of incorporation or the by-laws. He shall make at the annual meeting a detailed statement of the finances of the corporation. He must keep a regular book account, and his books shall be open for inspection at any time by any member of the association.

SECTION 5. The Board of Directors shall be the Executive committee and shall audit the accounts of the secretary and treasurer, and present a report of the same at the annual meeting; Executive committee shall procure a place to hold the meeting and make arrangements for Reception committees, hotel rates, halls, and all necessary preliminary arrangements for each and every meeting.

SECTION 6. The committee on programs shall make all arrangements for the proper working of the conventions, assigning all subjects, arranging for speakers, and make the division of time allowed to the discussion of each topic, to determine upon the time for the election of officers, conducting business meetings, and any other matters that may properly come under this division.

SECTION 7. The committee on resolutions shall draw up such resolutions as the exigencies of the time may require and which shall express the sense of the association.

SECTION 8. The said officers shall perform such additional or different duties as shall from time to time be imposed or required by the members of the corporation in annual meeting, or by the Board of Directors, or as may be prescribed from time to time by the by-laws, and any of the duties and powers of the officers may be performed or exercised by such other officers or officer, or such person or committee as the corporation or Board of Directors may authorize.

ARTICLE VI.

The treasurer of this corporation shall give a bond in the sum of one thousand dollars with two sureties, for the faithful performance of his duties.

ARTICLE VII.

These articles may be altered or amended at any regular session of an annual meeting of the members, provided the proposed alterations or amendments shall have been read before the association at least twenty-four hours previously, and provided also that such alterations or amendments shall receive a two-thirds vote of the members present.

ARTICLE VIII.

The first meeting of this association for the election of officers and directors shall be held on the 3d day of February, 1901, and such corporation shall hold a meeting of its members annually during each calendar year at such time as may be determined by the Board of Directors.

MEMBERSHIP WISCONSIN CHEESE MAKERS' ASSOCIATION, 1903.

A.

Aderhold, E. L.	Neenah	Wisconsin
Alves, H. C.	Sheboygan Falls	Wisconsin
Anderson, H.	Sheboygan Falls	Wisconsin
Aune, J. G.	Baldwin	Wisconsin
Andregg, Casper	La Crosse	Wisconsin
Adams, C. R	Spring Green	Wisconsin
Adams, J. F.	Slovan	Wisconsin
Aigner, Sylvester	Adell	Wisconsin
Austin, W. A.	Kewaunee	Wisconsin
Adams, Mike	Milwaukee	Wisconsin
Austin, H. W.	Richland Center	Wisconsin
Austin, H. E.	Boscobel	Wisconsin

B.

Benishek, Anton	Manitowoc	Wisconsin
Brandt, August	Forestville	Wisconsin
Bonick, G. E.	Maniwa	Wisconsin
Brucken, C.	Lone Rock	Wisconsin
Battes, B. C.	Clintonville	Wisconsin
Breit, J. C.	Stanley	Wisconsin
Bennett, C. H.	Proag	Wisconsin
Boyd and Drischel	Cambridge City	Indiana
Bachmann, J. F.	Bonduel	Wisconsin
Baer, U. S.	Madison	Wisconsin
Buss, A. O.	Pella	Wisconsin
Boldt, F. C.	Gibbsville	Wisconsin
Bender, F. J.	Boaz	Wisconsin
Becker, Henry	Scott	Wisconsin
Beckwith, Delos	Muscoda	Wisconsin
Brost, Matthew	Fond du Lac	Wisconsin
Baner, Robert	Fond du Lac	Wisconsin
Boll, Ernest	Erdman	Wisconsin
Bagnall, J. W.	Jacksonville	Wisconsin
Bamford, H. J.	Plymouth	Wisconsin
Becker, O. N.	Lynn	Wisconsin
Brown, F. B.	Richland City	Wisconsin

Burg, L. J.	Horicon	Wisconsin
Blanck, A. H.	St. Cloud	Wisconsin

C.

Cross, J. W.	Mauston	Wisconsin
Chaplin, Erle	Plymouth	Wisconsin
Conrad, Rudolph	Edwards,	Wisconsin
Chaplin, H. A.	Plymouth	Wisconsin
Cornish, O. B.	Ft. Atkinson	Wisconsin
Casey, W.	Elgin	Illinois
Crosby, D. S.	Chicago	Illinois
Chalupnik, John	Tisch Mills	Wisconsin
Carmody, T. H.	Oconomowoc	Wisconsin
Clarson, John	Fennimore	Wisconsin
Casper, Chas.	South Germantown	Wisconsin

D.

De Haan, Matthew	Lineville	Iowa
Dimock, Ben	Muscoda	Wisconsin
Davis, E. L.	Spring Green	Wisconsin
Deicher, Herman	Glenbeulah	Wisconsin
Duebner, Otto C.	Manitowoc	Wisconsin
Dickson, W. C.	Madison	Wisconsin
Decker, P. G.	Appleton	Wisconsin
Davis, H. G.	Chicago	Illinois
Daywitt, H. B.	Boscobel	Wisconsin
Dally, B. H.	Milwaukee	Wisconsin
Dassow, R. R.	Sheboygan Falls	Wisconsin
Dassow, E. H.	Sheboygan Falls	Wisconsin
Davis, F. M.	Potsdam	N. Y.
De Land, A. J.	Sheboygan	Wisconsin
Damrow, Oscar	Sheboygan Falls	Wisconsin
Decker, A. J.	Fond du Lac	Wisconsin
Donath, Robt.	Random Lake	Wisconsin
Dodge, George	Sextonville	Wisconsin

E.

Emmerich, M. B.	Emmerich	Wisconsin
Eichinger, Joseph	Forestville	Wisconsin
Ehrlich, Otto	Sheboygan Falls	Wisconsin
Erdman, W. A.	Erdman	Wisconsin
Emery, J. Q.	Madison	Wisconsin
Ellefson, H. G.	Spring Green	Wisconsin
Erdman, A. B.	Nero	Wisconsin
Erbstoesur, Edward	Sheboygan Falls	Wisconsin

F.

Forward, F. L.	Seymour	Wisconsin
Felton, Mike	Seymour	Wisconsin
Franzen, H. R.	Roselleville	Wisconsin
Frederick, H. A.	Reedsville	Wisconsin
Fitzgerald, Chas.	Boaz	Wisconsin
Fisher, John	Boaz	Wisconsin
Fokett, Albert	Reif	Wisconsin
Frazer, G. W.	Appleton	Wisconsin
Fisher, Chas.	Hortonville	Wisconsin
Fa.k, Emil	Waldo	Wisconsin
Farrington, Edward	Greenleaf	Wisconsin
Frome, R. L.	Howards Grove	Wisconsin
Farrington, E. H.	Madison	Wisconsin
Fullmer, F. B.	Ettrick	Wisconsin

G.

Gartmann, Chas.	Sheboygan	Wisconsin
Godfrey, J. H.	Madison	Wisconsin
Ganschow, R. C.	Bonduel	Wisconsin
Goldenpennig, F. W.	Georgetown	Wisconsin
Grimm, O.	Sylvan	Wisconsin
Guelig, L. N.	Adell	Wisconsin
Greiner, P. H.	Appleton	Wisconsin
Gregorius, M. J.	Appleton	Wisconsin
Grootemont, John	Brillion	Wisconsin
Grills, Wm.	Pine Grove	Wisconsin
Green, R. C.	Albion	Wisconsin
Grover, Oscar	Viola	Wisconsin
Gartmann, F. W.	Sheboygan	Wisconsin
Garratt, Frank	Boaz	Wisconsin
Gallaway, G.	Halder	Wisconsin
Groche, Loni	Ackerville	Wisconsin
Graskamp, H. H.	Van Dyne	Wisconsin
Ganz, W.	Brodhead	Wisconsin

H.

Hoeppner, John	Marion	Wisconsin
Hazen, L.	Eastman	Wisconsin
Herold, J., Jr.	Branch	Wisconsin
Hardison, W. F.	Alma Center	Wisconsin
Henseler, Anton	Marshfield	Wisconsin
Hamm, W. P.	Kohlsville	Wisconsin
Harms, Chas. T.	Sheboygan	Wisconsin
Helm, A. B.	Oshkosh	Wisconsin

Henry, A. E.	Sheboygan Falls	Wisconsin
Held, Fritz	Mt. Horeb	Wisconsin
Hinbregtse, Albert	Ostburg	Wisconsin
Hastings, Forest	Burlington	Wisconsin
Hahn, A. A.	Ada	Wisconsin
Howe, J. H.	Spring Green	Wisconsin
Horton, R. A.	Fond du Lac	Wisconsin
Heckert, C. A.	Chilton	Wisconsin
Harder, F. J.	Chilton	Wisconsin
Hoerl, S. M.	Brothertown	Wisconsin
Huffman, Howard	Richland Center	Wisconsin
Howie, Mrs. Adda F.	Elm Grove	Wisconsin
Hangartner, J. J.	Marion	Wisconsin

J.

Joslin, H.	Excelsior	Wisconsin
Jasper, Joseph	Mary Town	Wisconsin
Johnston, Thomas	Boaz	Wisconsin
Jonely Bros.	Brownsville	Wisconsin
Joslin, H. C.	Excelsior	Wisconsin
Jones, A. A.	Fond du Lac	Wisconsin
Jarvis, A. C.	Indianola	Iowa

K.

Kelty, John	Boscobel	Wisconsin
Kaley, M.	Loretto	Wisconsin
Kasper, P. H.	Clintonville	Wisconsin
Koopman, A. C.	Port Washington	Wisconsin
Krueger, C. F.	Konerh	Wisconsin
Kirkpatrick, John	Chicago	Illinois
Koehler, A. C.	Plymouth	Wisconsin
Kielsmier, O. A.	Hika	Wisconsin
Knickerbocker, S. E.	Spring Green	Wisconsin
Klessig, H. L.	Cleveland	Wisconsin
Karolus, H. E.	Tigertown	Wisconsin
Koch, W. A.	Nero	Wisconsin
Kornely, C. E.	Kingbridge	Wisconsin
Kerscher, J. F.	Manitowoc	Wisconsin
Kachel, T. A.	Whitewater	Wisconsin
Karlen, Jake	Monroe	Wisconsin
Kleemann, Edgar	Watertown	Wisconsin
Kipfer, Fritz	Monroe	Wisconsin
Kleinhesselink, L.	Oostburg	Wisconsin
Karlen, Jacob	Monroe	Wisconsin
Karlen, F. J.	Monroe	Wisconsin
Klemme, A. G.	Sheboygan Falls	Wisconsin
Keller, C.	Clintonville	Wisconsin
Kohl, E. C.	Waldo	Wisconsin

L.

Luchsinger, John	Monroe	Wisconsin
Lieurance, A. S.	Hurricane	Wisconsin
Lepley, Edgar	West Lima	Wisconsin
Langer, J. H.	Pierz	Wisconsin
Laing, I. F.	Chicago	Illinois
Lounsbury, J. M.	Watertown	Wisconsin
Libcke, F. S.	Somerset	Wisconsin
Lee, Niel	Muscoda	Wisconsin
Leavens, A.	Sheboygan Falls	Wisconsin
Lensink, Will.	Cedargrove	Wisconsin
Loud, E. P.	Milwaukee	Wisconsin
Luethy, A. D.	Plymouth	Wisconsin

M.

Maedke, Ed.	Hilbert	Wisconsin
Moore, Chas.	Muscoda	Wisconsin
Mueller, Henry	Sheboygan Falls	Wisconsin
Marty, Fred	Browntown	Wisconsin
Martinson, J. C.	Menomonie	Wisconsin
Miller, G. H.	Jefferson	Wisconsin
Muehleisen, G.	Lake Geneva	Wisconsin
Miller, Chas.	Knowles	Wisconsin
Mertens, John	Plymouth	Wisconsin
Mayer, J. C.	Kohlsville	Wisconsin
Michaels, M.	Garnet	Wisconsin
Mason, Peter	Manitowoc	Wisconsin
Marty, Jacob	Brodhead	Wisconsin
Miller, T. B.	London	Canada
Meyer, H. D.	Greenleaf	Wisconsin
Miller, E. O.	Appleton	Wisconsin
Mallmann, James	Sheboygan	Wisconsin
McKinnon, M.	Sheboygan Falls	Wisconsin
McVay, A. J.	Bonduel	Wisconsin
McCready, J. B.	Menomonie	Wisconsin
McKinnon, E. L.	Sheboygan Falls	Wisconsin
McCaig, J. H.	Hubbleton	Wisconsin

N.

Noyes, H. J.	Muscoda	Wisconsin
Nisbet, Hugh	Madison	Wisconsin
Ninnemann, H. W.	Waldo	Wisconsin
Noyes, Luther	Muscoda	Wisconsin

O.

Okonsky, P. H.	Kewaunee	Wisconsin
Olm, O.	Hayton	Wisconsin
Olson, M. J.	Medford	Wisconsin

P.

Pickard, Chas.	Muscoda	Wisconsin
Parkin, A. W.	Stanton	Minnesota
Powell, J. K.	Stevens Point	Wisconsin
Parge, H. C.	Dorchester	Wisconsin
Peacock, P. H.	Sheboygan	Wisconsin
Pheatt, H. D.	Milwaukee	Wisconsin
Peters, J. H.	Sheboygan Falls	Wisconsin
Pasch, Wm.	Sheboygan Falls	Wisconsin
Pingel, E. C.	Chilton	Wisconsin

Q.

Qrade, Henry	Watertown	Wisconsin

R.

Ryder, R. C.	Menomonie	Wisconsin
Roycraft, A. J.	Chippewa Falls	Wisconsin
Rusch, A. J.	Thorp	Wisconsin
Row, E. A.	Seymour	Wisconsin
Ritzke, Joseph	Jericho	Wisconsin
Reid, J. J.	Alderly	Wisconsin
Roemer, Jos.	Fond du Lac	Wisconsin
Rusch, O. A.	Peshtigo	Wisconsin
Roth, Christ.	Monroe	Wisconsin
Rothenbach, Jacob	Ackerville	Wisconsin
Regez, Jacob	Monroe	Wisconsin
Ruetten, Peter	Twin Bluffs	Wisconsin
Rehm, Wm.	Plymouth	Wisconsin
Radke, H. A.	Houlton	Wisconsin
Roycraft, Thos.	Chippewa Falls	Wisconsin
Radloff, Max P. E.	Hustisford	Wisconsin

S.

Stanz, H. B.	Milwaukee	Wisconsin
Scott, H. M.	Sheboygan Falls	Wisconsin
Schaller, Alex.	Mt. Horeb	Wisconsin

Schaefer, J. A.	Prairie Farm	Wisconsin
Schafer, B. J.	Darlington	Wisconsin
Schwichtenberg, Wm.	Sturgeon Bay	Wisconsin
Simon, M. N.	Neenah	Wisconsin
Schlosser, Jake	Spring Green	Wisconsin
Scott, V. M.	Stockbridge	Wisconsin
Sixel, H. C.	Sheboygan	Wisconsin
Schripke, Anton	Halder	Wisconsin
Sonnabend, H. R.	Collins	Wisconsin
Stiehns, L. F.	Johnsons Creek	Wisconsin
Snort, W. H.	Chili	Wisconsin
Spaeth, August	Random Lake	Wisconsin
Siggelko, E. O.	Hika	Wisconsin
Schummay, C. P.	Milwaukee	Wisconsin
Sweeting, C. W.	Manitowoc	Wisconsin
Simmons, D. D.	Viola	Wisconsin
Shurr, Albert	Milwaukee	Wisconsin
Schanen, N. J.	Lake Church	Wisconsin
Schaller, Rudolph	Barneville	Wisconsin
Schultz, A. J.	Kiel	Wisconsin
Schmitt Bros.	St. Kilian	Wisconsin
Schultz, H. S.	Cato	Wisconsin
Slyfield, E. L.	Sheboygan	Wisconsin
Streblow, W. G.	Plymouth	Wisconsin
Schafer, G. H.	Marshfield	Wisconsin
Smethurst, J. M.	Chicago	Illinois
Schafer, P. G.	Kewaunee	Wisconsin

T.

Taplin, Lloyd	Elmwood	Wisconsin
Thoni, Mike	Hollandale	Wisconsin
Turba, M. E.	Chilton	Wisconsin
Thym, Ottomas	Manchester	Wisconsin
Teschendorf, E. S.	Fond du Lac	Wisconsin
Tenner, Frank	Sheboygan Falls	Wisconsin
Termaat, Eddie	Plymouth	Wisconsin
Tiechter, Jacob	Monroe	Wisconsin
Turner, F.	Richland City	Wisconsin
Thomas, W. C.	Sheboygan Falls	Wisconsin
Trumbull, Roy	Quincy	Wisconsin

U.

Uttermark, C. J.	Somerset	Wisconsin
Ubbelohde, T. A.	Glenbeulah	Wisconsin

V.

Vogt, John	Orihula	Wisconsin
Van Elston, A. C.	Muscoda	Wisconsin
Viergutz, F. A.	Chippewa Falls	Wisconsin
Victor, F. M.	Muscoda	Wisconsin
Vorman, H. E.	Kasson	Minnesota
Van Blarcon, J.	Boltonville	Wisconsin
Van Dewall, E.	Hoard	Wisconsin

W.

Waegli, G.	Kewaunee	Wisconsin
Winkler, R.	North Lake	Wisconsin
Waterstreet, Wm.	Chicago	Illinois
Walvoord, Tony	Cedar Grove	Wisconsin
Wolfinger, J.	Dundas	Wisconsin
Ward, J. E.	Sandusky	Wisconsin
Waterstreet, R. A.	Kewaunee	Wisconsin
Woodstock, Archie	Lima Center	Wisconsin
Winsor, G. B.	Mauston	Wisconsin
Watson, Frank	Oregon	Illinios
Wheeler, Roy	Muscoda	Wisconsin
Walsh, W. S.	Oshkosh	Wisconsin
Wallace, P. W.	Hortonville	Wisconsin
White, C. A.	Fond du Lac	Wisconsin
Wetor, John	Random Lake	Wisconsin

Z.

Zimmerman, F. F.	Minneapolis	Minnesota
Zych, J.	Timothy	Wisconsin
Zang, Fred	Marion	Wisconsin

ELEVENTH ANNUAL CONVENTION

OF THE

Wisconsin Cheese Makers' Association

HELD IN THE

CONVENTION ROOMS, REPUBLICAN HOUSE,

MILWAUKEE, WISCONSIN,

Wednesday, Thursday and Friday, January 7, 8 and 9, 1903.

PROGRAM.

OPENING SESSION.

Wednesday, 10 A. M.

Address of Welcome .....
.....Hon. David S. Rose, Mayor of the City of Milwaukee
Response .....John B. McCready, Madison, Wis.
State Traveling Cheese Instructor.
General Greetings.
President's Annual Address .....W. C. Dickson, Madison, Wis.
Appointment of Committees.
Inspection of Cheese Exhibit.

SECOND SESSION.

Wednesday, 2 P. M.

Cheese-Makers' Class.

Ten Practical Lessons in Cheesemaking by Ten Practical Wisconsin Cheese-makers; Each Lesson Limited to Five Minutes.

1. a. The Qualifications Necessary to Be An Up-to-Date Cheese-maker .....J. F. Bachmann, Black Creek, Wis.
2. b. Care of Milk for Cheese....M. McKinnon, Sheboygan Falls, Wis. Vice-President W. C. M. A.
3. c. Receiving Milk at the Weigh Room..... .....H. C. Alves, Sheboygan Falls, Wis.
4. d. Preparing Starters and Ripening the Milk..... .....Hugh Nesbit, Madison, Wis.
5. e. Setting, Cutting and Cooking of the Vat..... .....G. W. Nelson, Omro, Wis.
6. f. Drawing Off the Whey and Handling of the Curds on the Racks .....F. F. Zimmermann, Mt. Horeb, Wis.
7. g. Milling, or Grinding, and Salting of the Curd..... .....Chas. Gartmann, Sheboygan, Wis.
8. h. Pressing and Bandaging Cheese...Chas. Pickard, Muscoda, Wis.
9. i. Curing of Cheese .....V. M. Scott, Stockbridge, Wis.
10. j Boxing and Shipping .....O. A. Kielsmeier, Hika, Wis.

THIRD SESSION.

Thursday, 9 A. M.

The Babcock Test and the Cheese Maker..... .....Prof. F. W. Woll, Madison, Wis. Chemist Wisconsin Experiment Station.

Address—Cheese Making .....T. B. Miller, London, Ont., Canada Manager Thames Dairy Company.

Economy in Marketing Cheese .....H. K. Downing, Milwaukee, Wis.

Address—Improved System of Handling and Marketing the Cheese Product of Wisconsin ....Hon. Casius C. Rogers, State Senator, Milwaukee, Wis. Representing the Merchants' and Manufacturers' Ass. of Milwaukee.

FOURTH SESSION.

Thursday, 2 P. M.

The Desirable Qualities in Canadian Cheese .....
.....H. H. Dean, B. S. A., Guelph, Canada
Prof. Dairy Husbandry, Ontario Agricultural College.

Educational Cheese Contest.

Reading of the Cheese Scores by Chairman of the Committee on Cheese Judging.

Awarding of Medals and Diplomas.

All Medals and Diplomas will positively be properly engraved, signed and awarded at this session.

Short Statements from Prize Winners, How Cheese Was Made.....

Cutting of the Prize Cheese .....

Report of Expert Critic .....E. L. Aderhold, Neenah, Wis.
State Traveling Cheese Instructor.

General Discussion—What is a Good Cheese .....

Discussion—Ways and means of inaugurating a six months' educational cheese contest for the season of 1903. Members are requested to come prepared to make suggestions.

FIFTH SESSION.

Thursday, 7:30 P. M.

Report of Secretary .....U. S. Baer, Madison, Wis.

Report of Board of Directors .....
.....J. K. Powell, Chairman, Chippewa Falls, Wis.

Report of Treasurer .....John B. McCready, Madison, Wis.

Reports of Committees.

Election of Officers and Business Meeting of the Association.

SIXTH SESSION.

Friday, 9 A. M.

Women as Cheese Factory Managers and Cheese-makers.....
.....Miss M. A. Raeder, Milladore, Wis.

The Cheese-maker and the Patron .....C. H. Everett, Racine, Wis.
Editor Wisconsin Agriculturist.

Address—Fancy Brands of Cheese; Its Manufacture and Sale in the United States ....Hon. John Luchsinger, Monroe, Wis
Pres. Southern Wis. Cheese Makers' Ass'n.

Breeding and Rearing a Profitable Dairy Worker.....
....Mrs. Adda F. Howie, Sunny Peak Farm, Elm Grove, Wis.
Will the Acidimeter Replace the Rennet and Hot Iron Tests in Cheese-making? .....H. H. Dean, B. S. A., Guelph, Canada.
Prof. Dairy Husbandry, Ontario Agricultural College.

SEVENTH SESSION.

Friday, 2 P. M.

Swiss Cheese Making; Methods of Manufacture.....
.....Fred Marty, Madison, Wis.
Instructor in Foreign Cheese Making, Wis. Dairy School.
How to Pay for Milk at Cheese Factories .....
.....H. Anderson, Sheboygan Falls, Wis.
Northern Wisconsin—Its Future in Cheese Production .....
.....F. W. Laabs, Colby, Wis.
Experience of Past Season in Cheese Making...W. H. Short, Chili, Wis.

PREMIUMS.

Medals.

The Association offers handsome gold, silver and bronze medals, artistically engraved, and of beautiful design, to those exhibitors securing the first, second and third highest scores on cheese in the American or Cheddar class.

Gold, silver and bronze medals will be awarded to those exhibitors securing the first, second and third highest scores in the Swiss cheese class.

Gold, silver and bronze medals will be awarded to those exhibitors securing the first, second and third highest scores in the Brick cheese class.

Gold, silver and bronze medals will be awarded to those exhibitors securing the first, second and third highest scores in the Limburger cheese class.

All the medals offered in the above classes are of one make and design. Each medal will be properly engraved, giving the score of the cheese and the name of the winner.

Every exhibitor whose cheese scores above 90 points, will receive a diploma signed by the judges and verified by the President and Secretary, setting forth the score of the cheese, the highest score, the lowest score, and the average score of all cheese exhibited at the meeting.

$100 EDUCATIONAL CONTEST.

Cheddars, Flats, Daisies, Specials, Picnics, Stove Pipes, Young Americas, Swiss, Brick, Limburger, Edam, Gouda, Pine Apple, Print, etc.

The above cash premium will be awarded on the excess pro-rata plan to all entries scoring above 90 points. Exhibitors will be limited to one package only in each class, and entries from the same factory under different names or by different exhibitors, are prohibited.

On all premiums amounting to $5.00 or over, fifty per cent. will be deducted if the exhibitor does not attend the convention. Makers exhibiting cheese, and not attending the meeting in person will in no instance be awarded a medal.

This Educational Contest is open to the world. The well-known cheese instructor of Wisconsin, Mr. E. L. Aderhold, has been engaged to follow the judges in their work of scoring and take notes of the points criticised by them. From the data thus secured in connection with the method of manufacture, as reported in the entry blanks, he will point out the faults and defects if there be any and offer suggestions and instructions whereby such defects may be overcome and avoided in the future.

Judges:

John Kirkpatrick, Chicago, Ill.

I. F. Laing, Chicago, Ill.

Superintendent:

J. W. Cross, Mauston, Wis.

CHEESE EXHIBIT.

Rules.

Each cheese factory represented in this Association has the privilege of entering the competition for medals and the pro rata fund, either by owner or maker, one or more full cream cheese, the exhibit not to weigh less than thirty pounds, made at any time, unbored and properly vouched for in writing by the owner, maker and one disinterested party, giving the full data required by the entry blank.

Entry blanks will be furnished by the secretary, **U. S. Baer, 450 to 452 W. Gilman St., Madison, Wis.** Order entry blank in due time to avoid delays.

Any person not a paid up member wishing to exhibit cheese, should send $1.00 membership fee to the Secretary.

Cheese may be shipped by express (charges paid by the Association) to the Secretary, at Milwaukee, Wis., leaving off his street address.

All cheese must be in the city on the Monday before the convention.

Exhibitors will be limited to one package only, in each class.

The tag upon the box shall contain the name and address of the exhibitor, a duplicate of which shall be pinned on the cheese inside the box. This will prevent mistakes should the outside tag be destoyed in transit.

Swiss cheese may be entered in either drum or block shape.

It is earnestly requested that Brick and Limburger cheese be exhibited in full cases. In no instance will an exhibit of less than thirty pounds be permitted to enter in competition for medals and the pro-rata premium fund. Flats weighing less than thirty pounds singly, should be exhibited two in a box. Daisies, Young Americas, Prints, etc., should be exhibited in lots equivalent to thirty pounds.

Upon receipt of cheese at the exhibition hall, all tags, cards and markings will be removed by the Superintendent, and will be substituted by entry cards of the Association, designating number of entry. Names of exhibitors will be withheld from the judges until after the awards are made.

The Superintendent of this department shall have the right to call for proof as to owner or maker of any exhibit; any fraudulent entry shall be barred from competition.

No cheese previously tested with a trier will be considered as an exhibit for premium. Such cheese will be entitled to a complimentary score only.

The cheese scoring the highest number of points in the gold medal classes will be retained as the property of the Association to be cut up and distributed to those present, and the judges will address the meeting on the qualities of fine cheese in the discussion "What Is a Good Cheese."

Scale of points for judging American cheese:

Flavor	45
Texture	30
Color	15
Make-up	10
Total	100

Brick and Limburger cheese will be scored the same as American, except flavor will be 40, and style or make-up 15 points.

Swiss cheese will be scored on a scale of 100 as follows:

Flavor	30
Appearance on Trier (holes)	25
Texture	20
Color	10
Salt	10
Style	5
Total	100

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS

OF THE

Wisconsin Cheese Makers' Association.

ELEVENTH ANNUAL MEETING.

The meeting was called to order at 10 o'clock A. M., January 7th, 1903. President W. C. Dickson in the chair.

The Chairman: The convention will be in order. Gentlemen, at our initial trip to the city of Milwaukee last year, we were deprived of the pleasant face of Mayor David S. Rose, but he sent a very good substitute in his place. This year I am afraid we will have neither the Honorable Gentleman, nor a substitute. He has sent word that an important committee has come up from Chicago whom he had to meet, and it will prevent his coming here this forenoon. He may possibly be able to come tomorrow, or next day, but will come some time before the convention closes, so we will have to do without the address which we expected to receive from him this morning.

ANNUAL ADDRESS.

President W. C. Dickson, Madison, Wis.

Gentlemen: I am at a loss to understand why it is that the presiding officer of all similar organizations as our own is usually expected to deliver each year what some people choose to term his annual address. I myself consider it an imposition on your President; and a torture to his hearers.

The past year has been a memorable year in the cheese annals of the state, and I don't think that any person or persons who are directly interested in the cheese business of the state will deny, that it has been a very profitable year. Prices have been such as to warrant the milk producers to more strenuous efforts in increasing their stock; and by kind care induce their bovine ladyships to pour forth a greater quantity of the lactic fluid.

The cheese buyers also have been particularly fortunate in realizing a snug profit from their business, and they have displayed their full appreciation of their successes, by liberally contributing to our Association, sufficient funds to induce you to make an unusually fine exhibit of cheese.

What now shall I say regarding that class of men in whom we are more directly interested. The patron of the factory, the owner of the factory, and the buyers; have all reaped a profit but the cheese maker has worked night and morn for the same pittance that former years provided for him; yet notwithstanding all this, he also has received his reward together with the others named, and it would be wrong for me to attempt to inculcate into your minds the seeds of discontent.

You must not forget that in former years that very frequently you were made the scape-goats of unscrupulous buyers, who never lost an opportunity to place the blame of a fluctuating market on your innocent shoulders by rejecting your cheese; this year, however, the great demand for cheese was such that they could not afford to reject on technicalities as they did in

former years, therefore you derived benefits which usually meant losses, and you, as well as others, have great reasons to feel elated over your past year's business.

I don't think, however, that we have many factory owners in the state, who have of their own free will and goodness of heart, and actuated by a sense of duty, generously contributed an extra five or ten to your month's salary; if such a man exists, his name should be published to the world; in fact, I think if such a man lives, you should make him without one dissenting voice your next president.

Our organization, as you will learn from our very worthy Secretary's report, while in a very prosperous condition at the present time, financially, was strained to the utmost capacity during the past year, therefore I would suggest to you the advisability of discussing and adopting means at this convention whereby we may secure from our worthy state legislature an increase in our annual appropriation which is now $400.00, but should be $1,000.00.

I should also like to see power vested in the Cheese Makers' Association to appoint the state instructors, instead of being appointed by The Dairymen's Association, as is now the custom. This appears to me to be a very important matter, and should demand your careful deliberations.

Another important subject which demands your approval or disapproval is the advisability of establishing a State Cheese Board in Milwaukee. This you understand has been agitated recently in the state press, more particularly the Milwaukee portion of it. I am not here to offer suggestions on this or any other subject, therefore you, yourselves, should have no hesitation in giving your opinions whether favorable or unfavorable, to such a project, as much depends on your consent or dissent.

The people of Milwaukee have been very kind to us (all of which we appreciate and feel grateful for), yet a sacrifice of sectional or personal interests should first be considered by you before jumping at conclusions.

We are particularly fortunate in having with us on this occasion two of Canada's most worthy sons, who have at the risk

of courting disfavor at the hands of their countrymen cancelled their engagements at home in order to assist us Wisconsin boys in our march of progress. It is not necessary for me to remind you of your duty on this occasion, for the cheese makers of Wisconsin are naturally of an appreciative turn of mind, and need no reminder of their duties.

Our Secretary, on whom devolves everything, and all things, which makes your conventions a success, has this year, as he has in all former years, arranged your program, and has selected the best men from within our state borders to address you. You will also extend to them your careful attention.

In closing, permit me to remind you that for three consecutive years you have bestowed on me the honor of electing me your president, for which I feel deeply grateful. Today your membership has increased to such an extent that it requires a man of ability to preside over your deliberations; feeling my utter inability to fulfill the necessary requirements, I take this opportunity of announcing to you that under no consideration do I desire my name to be used as a possible successor to myself. Thanking you for the three time honors you have already bestowed, I now proclaim this meeting open to transact business of importance.

The Chairman: The next feature of our program is appointment of committees, which will be done in accordance with the usual custom. The inspection of cheese exhibits, I understand, cannot be made until tomorrow. Now, there are a great many members here who have not received badges, and I have done a great deal of hard work myself this morning in signing those membership cards. On receipt of one dollar, the secretary will give you a card and a badge, and your name will be enrolled among the good and true, and by contributing this small amount, you also assist us very materially financially.

I think it would be in order now, after making the afternoon announcements, to declare the meeting adjourned for the

present, and allow you, who have not signed the roll, an opportunity to do so.

After announcing the program for the afternoon, the convention adjourned until 2 o'clock P. M.

APPOINTMENT OF COMMITTEES.

The following committees were appointed by the chair, assisted by the convention:

On Resolutions:

Horace Davis, Chicago, Ill.
J. F. Bachmann, Black Creek, Wis.
R. C. Green, Albion, Wis.

On Legislation:

A. DeLand, Sheboygan, Wis.
M. McKinnon, Sheboygan Falls, Wis.
A. L. Aderhold, Neenah, Wis.
F. J. Bender, Boaz, Wis.
J. W. Luchsinger, Monroe, Wis.

AFTERNOON SESSION.

The convention met at 2 o'clock P. M.
President Dickson in the chair.

TEN PRACTICAL LESSONS IN CHEESE MAKING BY TEN PRACTICAL CHEESE-MAKERS; EACH LESSON LIMITED TO FIVE MINUTES.

THE QUALIFICATIONS NECESSARY TO BE AN UP-TO-DATE CHEESE MAKER.

J. F. Bachmann, Black Creek, Wis.

On account of existing circumstances it is not always an easy matter to find up-to-date cheese makers in every locality. To be an up-to-date cheese maker many qualifications are necessary, which we can not obtain without spending money liberally in order to prepare ourselves for our calling. We can not haul away a load of cheese from a factory and be an up-to-date cheese maker; we are not qualified and ought not be entrusted with a pound of milk to convert into cheese, unless we have properly prepared ourselves for our work, unless we have a proper building and proper machinery to work with, for surely no maker can call himself up-to-date, who is working in a shanty, or cheese shed in which the cheese will melt on the shelves in the summer and freeze in the vat or in the press in the fall and winter. No up-to-date maker will put up with such conditions although it is true that in many instances it does not pay to make many improvements. As most of you will agree with me a course of dairy instruction is resirable to train young men to become up-to-date makers. It is true that a man can make cheese and make good cheese, too, sometimes without theoretical training, but in this age of progress there are so many things a maker ought to be able to explain to his patrons, which he is unable to do if he had no theoretical education on the subject. So leaving off all arguments whether a dairy student be better qualified for the cheese factory or not, the very fact that a maker with a dairy school education makes a better impression on his patrons is well worth attending one

term in a good dairy school to secure a dairy certificate; that sometimes goes a long ways with patrons. Many farmers will willingly abide by the decision of such a man in regard to test, weight, quality of milk, otherwise they would not believe a man whom they know to possess no scientific education in regard to the dairy. So in short, I believe an up-to-date cheese maker should be a graduate of a good dairy school. "Honesty is the best policy" should be the cheese makers' golden rule. I don't know whether that is up-to-date or not, but one thing is certain, that by adopting that policy a man will make cheese the longest in one factory. A man might have all qualifications pertaining to cheese making, and if he be dishonest he will never be successful and will, when he is compelled to leave his factory, have the shortest end of the stick. Therefore let honesty be our policy and insist that we be treated honest by our patrons.

There are a few other qualifications a man should possess. He should know how to hold his meetings with the patrons to the best advantage of all concerned, for on his spring meeting depends his summer's earnings. He should be sober and at his place at all times; at the intake or anywhere else he should show himself a gentleman, so that he may in return again be respected by his patrons. He should read books, bulletins and papers treating upon dairying and cheese making, so that he may keep posted on up-to-date methods, markets, and other things pertaining to the cheese interest. An up-to-date maker should attend conventions of cheese makers, and in order to find out whether he be up-to-date or not he should exhibit his goods wherever there is an opportunity.

As a man of character he should only receive good milk at his factory.

I will not enter in any details as to methods he should employ, since I see that every step in cheesemaking will be treated by more competent speakers, but will only say in conclusion that an up-to-date maker will keep his factory and everything in connection with it neat and clean, so as to set a good example before his patrons.

CARE OF MILK FOR CHEESE.

M. McKinnon, Sheboygan Falls, Wis.

Mr. President, Ladies and Gentlemen: At our last annual meeting I made a few remarks on this question, "The Care of Milk for Cheese Making," just to see how my ideas would be received, and I am inclined to say that I was not greatly elated over its reception. But, this did not discourage me in the least.

I believe these ideas that I wish to present, are new to a great many, and if they are good for anything (and I believe they are), they have the merit of being somewhat original.

Now, gentlemen, I have tested my theory by actual practice for the last four years, and I believe I know what I am saying, to be strictly true. Previous to that, however, I worked on the old plan, practicing all the foolish delusions we have been taught to believe in for the last thirty-five years. You are all familiar with this teaching, you know what tools we used in this work.

We had the little dipper, then the big dipper. With these dippers we were taught to elevate the milk and pour it back slowly into the cans. This was done so the milk could receive the benefit of the oxygen in the air. They not only astounded us with this word oxygen, but they confused us as well.

The average farmer or cheese maker knows but little about oxygen and cares but little about it.

Then we had an inverted funnel with a long handle attached to it. With this contrivance we could pump into our cans of milk, air, microbes and oxygen to our hearts content. We have also had many other kinds of aerators. Some of them I have used and bought them for my patrons to use.

I have worked along these lines for more than thirty years, as a milk producer and as a cheese maker, and I have never been satisfied with the results.

Some four years ago I arrived at the conclusion that this idea of aerating milk is all wrong; that milk when it comes

from the cow (it the cow is in good health) we can safely consider good milk. But, let that milk be exposed to the air for a short time and it will become alive with germs.

So, too, if you go down deep in the ground you can procure pure cold water, but if you bring this water to the surface, expose it to the air but a short time, it too, will become alive with germs.

We all know that it is not necessary to expose water to the air, and I know that it is not a good plan to expose milk to the air either. Some three or four years ago one of my patrons took up part of his stable floor, preparatory to putting in a new one. He continued to milk in this stable while the floor was in this disturbed condition.

Gentlemen, have any of you had any experience of this kind with old stable floors? It will suffice to say in the strong and impressive language of one of our prominent members, that no civilized person can have a hankering for that peculiar odor. It so happened that Mr. Aderhold was at my factory at this time and he made a Wisconsin curd test. This test was the cause of me calling on that particular patron the next day. He had seen the curd made from his milk and was feeling badly worked up about it. He then told me how he milked and how he cared for the milk. Two men did the milking, taking four pails to the stable; two they placed on a bench just back of the cows and two they used to milk in. These four pails would hold about all the milk from his cows. When through milking they would carry the milk to the cooling tank.

You can readily see the harm was done before the milk left the stable. The longer the milk was held in that unsanitary place and the more it was stirred, or exposed to this foul air, the more impure it became. I believe no one will dispute this point. Now then, I think it necessarily follows, that unless you are sure the air is pure and free from germs (and no one can very well know this), you had better take every precaution to keep the air and germs out. "An ounce of prevention is worth a pound of cure."

I believe that milk for cheesemaking doesn't need air mixed

with it any more than it needs rain water, or snow water; nor does it need oxygen any more than it needs English gin or Milwaukee beer.

Let me give you my rules; they are short and easily complied with.

1st. Have plenty of cold water in your cooling tank.

2nd. Set your cans in this tank.

3rd. Milk your cows and as soon as possible distribute the milk in these cans; remember that you want to cool the milk in the shortest space of time, and that a small quantity in a can will cool quicker than a larger quantity. This more rapid cooling will check the development of any germs that may have come in contact with the milk during the time of milking.

Starting with the night's milking, I fill my cans about half full, try to keep them covered as much as possible while milking and as soon as the night's milking is all in I put the cover on and let it stand until the next milking. So when I am done milking I am also done caring for same.

The morning's milk I put on top of the night's milk while the cans are still in the cooling tank. This will cool the new milk a few degrees and thereby retard the development of any germs that may be in the new milk.

I believe that oftimes it is necessary to check these germs so that the cheese makers may be master of the milk when he has received it into his vat.

DISCUSSION.

Mr. McKinnon: Now, gentlemen, this is all very simple. I do not know but what it is so simple that some of you may smile at it, and I ought not to feel very badly if you laugh right out loud, but I believe it to be true all the same. We are told, way back in ancient history, there lived in Assyria a great man, a good man, a man that was of importance to the king, but this man was afflicted with leprosy, and it chanced that living

in the same house where this man lived, there was a Jewish maiden from Samaria, and she said to her mistress one day, "Would to God that my master was in Samaria, for there lives a great physician, a great doctor, who could cure him from his leprosy;" so this woman told her husband, and this husband told it to the chief, and the king said, "Go," and so they rigged him out in great style, they gave him a great troop of soldiers, and this man rode in the chariot and stopped before this great physician's house, and this physician sent out a message to him saying, "Go and dip yourself, go and bathe yourself seven times in the River Jordan." Now, when he had received this message, he thought it was a simple thing, and he became angry and thought he was abused, and he said, "Are there not many better streams of water in my own country than this Jordan, and must I needs come here to bathe in that filthy stream in order to be clean? I thought surely he would come out and call upon his God to drive away this leprosy, but he has treated the question as a very simple affair." In indignation he turned him around to go back to his own country, but his servants gathered around him and they said to him: "If he had told you to have done some great thing, some difficult thing, you would have complied with the request, but how much more necessary is it that you should comply with this simple remedy," so that they prevailed upon him, and he went and bathed himself seven times in the River Jordan, and lo! the color came back again to his skin, his flesh became as a child, and his leprosy had left him.

I think if you will try my way of caring for milk, you will find it to be just as efficacious as that man found his bathing in the River Jordan.

Mr. Helm: I would like to ask Mr. McKinnon if the milk will not be found to retain the cowy flavor if cooled in that way?

Mr. McKinnon: Gentlemen, we have all heard a great deal about the animal heat and cowy flavor in milk. A few years ago we made butter on what was called the Cooley system of making butter. We took the milk from the cow, and as soon as we got it from the cow, we put it in the can and submerged

it in ice water, cold water. A great many at that time said: "Why, that cannot be a good idea, because the animal heat has not escaped from that milk, and the cow odor (as they call it) has not escaped from that milk," and they pooh-poohed at that idea, and while they were pooh-pooing at that idea, and trying to solve it to their own satisfaction, men who did not look upon that as a bug-bear, were practicing the same thing, submerging their milk just as soon as they could draw it from the cow, and the result was this, that they got the very highest price that was paid for butter; the very highest price. Now, we had a man up in our section of the country, the Honorable Hiram Smith, who was the first man to introduce the Cooley system of butter making, he said there was no such thing, and I believe there is no such thing now, as animal odor, that needs to be expelled from the milk. We found it to be so on the butter question, and I believe you will find it to be so on the milk question, treated for any purpose you have a mind to use it for, at least for cheese making or butter making.

Mr. Noyes: I would like to ask if that odor did not pass out while they were submerging the milk in that water, into the water? I think that has been demonstrated a great many times, that that odor did pass out into the water. I would like to ask Mr. McKinnon's opinion.

Mr. McKinnon: I was laboring under that opinion too, while I was making butter that way. I want to tell you that I made butter that way, and for seven years I had the distinction —I call it a distinction—I made butter in that way for seven years, and I sold my butter to the Plankinton House, and the Plankinton House rather boasted on the butter they were getting, and have always tried to get the very best butter they could get. Now, I was laboring under this same impression that the bad odor from the milk escaped that way, but if I remember correctly, the way milk will work after it has been submerged is this: you place it into that can, you put on a cover, and as the steam rises from the milk, it condenses on the cover, and as fast as it forms into drops, a large share of those drops will drop back into the milk, consequently, I do not

believe—I am fully convinced that there are no bad odors escaping from that milk that pass off into the water.

Mr. Noyes: I would like to ask another question in regard to a certain kind of milk, such as we have had to deal with. Take milk of this kind, the milk is set in spring water where it is perfectly cool and still, that milk is so bad that it floats the curd; we take that same milk, run it through our aerators and put it into that spring and next morning we can use it. I would like to ask Mr. McKinnon to explain that for us.

Mr. McKinnon: That is one of the delusions—I spoke of some delusions, and I believe that is one. A few days before I came down here, I was at a neighbor's house, who is one of our patrons, and in speaking about milk—we happened to be standing right close by a pig pen—now, yo know there is a bad odor from a pig pen always, at least I never saw a pig pen that there was not a bad odor escaping from, and this patron of mine said, "Your ideas are not endorsed, here is a man that does not practice your way," he says, "No, I put down a can this way, and Iput on the cover slanting, so as to have a circulation of air." He said he would have had to do it that way. I asked him this question, I said: "Now, we are standing right close to a pig pen with a bad odor, if you left a can standing right here by this pig pen, what would be the effect upon that milk?" "It would spoil the milk." I asked, "If the milk was covered up,, what effect would it have?" "Why," he said, "if it was covered up, it would take no harm."

Now, these are the ideas; I think they are correct. I could cite you a great many personal cases that have come under my observation that I have known of, where cheese makers have been bothered like everything with certain individual patrons, and they have resorted to my scheme and their troubles have diminished. Now, you expose milk to the air, every blessed man we have in this country tells us that smallpox germs, typhoid fever germs, and germs of all kinds, are floating in the air, and they cannot tell until the disease breaks out, neither can you tell, that there are germs floating in the air, until you expose your milk to it, and if you do not expose your milk to

the air, if you do not expose yourself to the smallpox, or come in contact with those germs, you will not have the smallpox.

Mr. Noyes: Every health officer in the land will advocate pure air and sunlight. You do not take that into consideration.

Mr. McKinnon: But they quarantine smallpox all the same, and all diseases of that kind, every contagious disease is quarantined.

Mr. Alves: I would like to ask Mr. Noyes if he can find pure air in the summer?

Mr. Noyes: Yes. You come over into Grant county, and you will find it.

Mr. Alves: And I would like to know if you could find it all over on 120 acres of land?

Mr. Noyes: Yes, you can.

Mr. Alves: We are pretty well represented in Sheboygan county, and perhaps a good many people think it rather foolish, a sMr. McKinnon talks, about taking care of milk. Probably you will remember Mr. Monrad in 1894, when we had the same thing, he advocated the cooling off milk as quikly as we could cool it, and my friend, Mr. Aderhold—I do not know whether he is here or not, it does not make any difference—he took the stand, to get the milk quickly aerated, and I always thought what he said was right, and he is right a great many times, but I guess all of us are mistaken sometimes, but I had a patron, and I found I could not get his milk perfect in any way or shape, and we conducted experiments in different parts of his yard, and where I really thought it was all right; but the milk would stay the same thing, full of gas holes and pin holes, and so I said to him, "Now, we will try the last thing, if that does not help, I do not know what we will do." And he milked the cows and we put it in the can, the can was half full, and we cooled it down as quickly as we could, stirred it a little, and then put the cover on, and I made a Wisconsin curd test, and I found the curd was perfect. So I practiced that all last summer, and I am positive that that is the easiest way and the best way.

Secretary Baer: I would like to hear from Mr. Millar, of Canada, as to what the instructions are with reference to this matter given by the Ontario factory men to their patrons. We would like to hear from Mr. Millar.

Mr. Millar: I might say, in Canada, we have adopted the system of aerating, airing and cooling, and we have obtained very good results from it. I must say that I was surprised to listen to Mr. McKinnon's paper, because some of the ideas that he put forth are entirely new to me, but it seems to me that under ordinary conditions, where you have a clean place, and I am sure you all have that, a place where the air is practically pure, that you will improve the milk by airing and cooling. Now, this gentleman that spoke last, that told us of the experience that he had with this one patron, said that they stirred the milk. Now, why did he stir it?

Mr. Alves: He stirred it to keep the cream down and to cool it off evenly.

Mr. Millar: And to allow any bacteria to escape with the steam rising off his milk. Do you mean to tell me, if you expose hot milk to air for a few minutes that is cooler, as our friend here spoke of airing, while the steam is rising off this milk, you are going to absorb the bad odors of the air?

Mr. McKinnon: Yes, if the next day, by actual test, you will find that that develops into a pin-holey curd, it could get in only one way, through the air.

Mr. Millar: When was this milk exposed, was it exposed longer than passing through the aerator?

Mr. McKinnon: That would be sufficient. If you have a machine, you would expose it to all the foul air that was playing around the milk.

Mr. Millar: I claim that if the air was reasonably clear, that the steam passing out of this milk, it would not become identified with the foul air of the atmosphere, at the same time, because your milk is warmer than the surrounding atmosphere, and the steam passing out, I fail to see where you get the milk contaminated in that short time. Men with us who get the best results, use a cooler that is cone-shaped, and this is filled

with ice and air. We get the best kind of milk from these people. Of course we have to use reasonable care in getting this, keep a clean place, where the operation is taking place, but I have followed cheese making for a good many years, and I have always advocated it, and I have not seen any good reason why I should not advocate it.

Mr. Noyes: If Mr. McKinnon has got something good here, we want it, but we are not going to swallow it until we know it is right or wrong.

Mr. McKinnon: That is right.

Mr. Noyes: The first act is to submerge in cold water and put the cover on. We followed that until we quit it, and then our milk was cooled, first put over an aerator and then cooled. When a man thinks there is not any pure air in Wisconsin, he simply don't live in the country. I do not think we find purer air and better, purer grasses, anywhere, and milk should be aired to take the animal heat out of it—animal odor, before it is cooled. That is the practice of all the best men we know, the leading dairy men, and men that deliver all the milk in the city, run their Star coolers or aerators with ice in. The milk is aired and cooled. That is the only way they can deliver milk in the city, and with us we find that is the only way we can get good milk, and every time we depart from that, we have to bring out patrons back to the aerating system. We do not allow them to deliver milk unless it is aired. I do not believe this plan that the gentlemen have spoken of is practical, and I believe we should be a little careful. Wisconsin is getting on a basis whereby we have a reputation for our cheese, and it seems to me that this is contrary to anything that we have learned for a great many years. Now, Mr. McKinnon, I think, claims it is an improved method, but this is an old method, surely, it is a method that has been laid away, and if you gentlemen in the northern part of the state can handle it successfully, all right, but I do not believe in adopting it universally, unless it is tried.

Mr. McKinnon: The rapid cooling that he speaks of is very good. Now, after he has cooled that milk down a few degrees

with that rapid cooling, even though he has introduced germs in this milk, those germs become inactive after your milk has run over that cooling surface, you have taken the germs with you as you have exposed it to the air, you have carried the germs with you, but you have cooled it rapidly over a bit of ice; that rapid cooling has checked the germs, and they do not develop; that rapid cooling is what has done it, the aerating has had no beneficial effect upon that milk whatever. We understand this, when people wish to raise bread, they add yeast, and in order to make that yeast work, what do they do? The yeast has to have certain things to work upon, as a matter of course, it has to have the substance which is in the flour, and it has to be moist, and is has to have a warm condition, so they set that bread close by the stove and keep it warm, and the germs will commence to work; but if they should set it to one side and cool it rapidly, the germs would not work, and if they bake the bread next day, they will have heavy bread. Now, when we keep our milk warm, or fail to cool it rapidly, we are allowing those germs to develop; now, the idea of cooling is all right, cool as rapidly as you can, that checks the germs, cool in the morning, too, that checks the germs. I have had morning milk come into my factory, and when I have tested it, it has developed a pin-holey curd, so I believe this theory is all right. I knew that this was a new idea when I brought it up.

Mr. Noyes: It is an old one.

Mr. McKinnon: I deny that it is old, Mr. President, from the simple fact that I commenced to make cheese in 1866, I owned a factory at that time, and I have kept in touch with all of the ways of cooling milk from that time down to this, and I never yet have been taught, nor do I know of a single case where they have resorted to deep setting of their milk, or rapid cooling of their milk, and that they have had to discontinue, hence it is not an old theory, it is not old by any means, but I want to say to you all, gentlemen, you know there is an old saying, "Be not the first by which the new is tried, Nor yet the last to lay the old aside." Now, do not try my theory until

occasionally you may have some patron in your factory, and you are not able to master the situation, and when you have such a patron, and when you are not able to master his milk, ask him to do as I have done, and the question will be solved.

Mr. McCready: The worst milk that I saw last summer was where the milk was only cooled that came into the place. I think you cannot get rid of the animal odor unless you aerate your milk. I do not believe in Mr. McKinnon's statement at all.

Mr. Alves: A gentleman has just asked me how it was 20 or 30 years ago, when they did not know anything about pin holes. That long ago they did not need to know anything about it; they could sell their cheese with pin holes in it.

Mr. McKinnon: Twenty or 30 or 40 years ago, there were no pin holes in our section of the country, and I take it for granted that the reason why there were no pin holes up there, was because we had none of the pin hole germs up there. Now we heard about floating curds all around in the state of Indiana and Illinois and New York state, but we did not know what a floating curd was, but we went to keeping cows, and you will bear me out in this, that when you stop to take into consideration that the longer you keep cows on a farm, the more apt the air is to become impure, the more apt the stable is to become impure, you can readily see that we are more apt to have germs. Twenty-five, 30 or 40 years ago, up in our section of the country, when the patrons brought the milk to our factories, it was brought almost universally from cows that were milked out in the yard and not in the stable; they were milked out where the air was pure; we did not have any germs then; we did not have to sell pin-holey cheese; we had no such thing as floating curd; the floating curd has come with our close stables and with the unsanitary conditions of the stables and the air around it.

Mr. McCready: Don't you think the pails and the cans that the milk comes in contact with has something to do with that?

Mr. McKinnon: Certainly, why not?

Mr. McCready: Will aeration help that any?

Mr. McKinnon: No, I do not think aeration is going to kill those germs, do you?

Mr. Cready: It will improve the quality of the milk.

It was voted that the following telegram be sent to the Canadian Cheese Makers:

"Milwaukee, Wis., Feb. 7th, 1903.

"Hon. D. Derbyshire,

"President Eastern Ontario Dairymen's Ass'n.

"Ottawa, Canada.

"The Wisconsin Cheese Makers' Association, assembled at Milwaukee, sends greetings. The Badger state cheese makers predict the Canadians a bountiful repast and rousing convention.

"Secretary U. S. Baer."

RECEIVING MILK AT THE WEIGHT ROOM.

H. C. Alves, Sheboygan Falls, Wisconsin.

Mr. Alves: I have not prepared any big lecture, nor any big paper. I do not really know what to say about this subject, but I will try to say a little something. The subject is, Receiving Milk at the Receiving Room. Now, that is one of the main points we have in making cheese. We should receive nothing but good milk and pure milk. Of course that is a pretty hard job to do, and it is pretty hard to detect all these bad flavors, and we oftentimes will take the milk in and think it is all right, but it seems to me when we have to heat it up and make a rennet test, that simply shows us how it is going to work. If you have a pure culture starter in, and your rennet test will not just work perfect, you are pretty liable to have pinholes and grassy curd, and of course it is always my aim to repeat it a little later. Now, another thing, if a man gets up in

the morning at the weighing can, he ought to be clean, and have everything clean, the weighing can and the scales correct, not go to work and try to cheat the patron out of a couple of pounds to make a good showing for the month; that is a poor policy; give them all that belongs to them in the first place; do not try to give them back what belongs to them afterwards, because that is injustice. I have been making cheese now for 15 years, and have run the factory seven years myself, and oftentimes I have neighboring factories scoop me like everything, and sometimes they took it off their patrons, and then gave it back again, but that is injustice; it makes it hard for a factory man sometimes, but I kept at the honest and right way, and I think that is the only way in which to make a success. Another thing, when a cheese maker is sloppy and dirty, and probably sometimes smokes or chews, or if anyone drinks during the morning when he takes in the milk, or smokes, he cannot detect milk as quickly if it is off, as he will if he is not smoking and chewing, because you know a person who chews tobacco or anything of that kind, cannot detect a bad flavor in the milk. So I think, if anything is wrong about the patron's milk, and the man himself is clean, he can simply step up and say, "You can see your own self your can is not perfectly clean, and you have a sediment in the can which is not clean," and when you turn over the can and show him a sediment, sometimes it is necessary to take out some of the sediment in a glass and ask him if he would not like to have a drink, and of course he refuses, and then you have a pointer, and you say: "Why, if it is too bad for you to drink, it is really too bad to make it up into cheese." (Applause.)

Now, we had quite a discussion about handling milk, and I stand up for Mr. McKinnon, still there are a good many against it; they say that it is an old method, and it may be; I have known it to be, because when I was at home, we used to take care of milk as Mr. McKinnon said, and then Mr. Noyes speaks in favor of aerating, and says we have pure air in Wisconsin; that is all right, we have that, too, in Sheboygan county, as anywhere else, but during the summer months, when the

farmers and patrons have so much work, do you want them to take their cows away from the barns and put them on an 80-acre lot to milk them? It is impossible, because they have got too much work to do, and they want to attend to the milk as well as possible with the least work. It is 15 years since I started up, and at that time when I had trouble, it was simply because we could not get any acid on the curd, and the milk was cooled down so thoroughly that we simply put it up, we did not have any rennet test when I started, and we did not have any pure culture starter, and so you see the curd was keeping up, and we could not get any acid on it, and of course it worked so slow and it became sticky, and that is the way we got most of our bad cheese, and it may be all right for the aerating part, if it is cooled at the same time, I would not object to that, but the more you stir your milk at a lower temperature, the more you churn, and there are breeds of cattle that have milk that will easily churn, and it is a loss every time, and so when the cans are covered up, and it is well cooled, and the cans have to be clean, and the cream stays in the milk, I think I really had good results last summer from the process that Mr. McKinnon told me of about a year ago. There are some of my patrons that do not do it, but wherever I found trouble, we tried it, and I am convinced that it is all right.

Mr. Noyes: When do you keep the most cream in your milk, when you stir it or let it stand still?

Mr. Alves: I do not stir it any more than is really necessary. But you run it through your aerator and it stirs itself, with all the bacteria going in it. Is not the milk pure when it comes from the cow?

Mr. Noyes: Yes.

Mr. Alves: Should not a good curd have the flavor of the breath of a healthy cow?

Mr. Noyes: Yes, you cannot get that, though, by leaving that animal odor in there.

Mr. Alves: Well, it is rather queer, as long as the cow is healthy and you have only got this one odor in there, as long as it is healthy, it should be pure.

Mr. Noyes: Your milk has incorporated all the bad flavor before it has reached the aerating point. We just simply remove it out to a place where there is pure air, whether it is cool or it is not cool, that is where it should be added. There run through an aerator and cool.

Mr. Alves: The longer you keep your milk before cooling the worse it gets in flavor.

Mr. Noyes: The faster your germs will grow, and you get bad results, you cannot get around that point. The warmer your milk is, if there are any germs in that milk, they will multiply a million times. If we had a chart here, I would like to show you how fast those germs multiply at a temperature of 78 or a temperature of 54. I should like to show you the difference on a screen.

Mr. Alves: That is why we are aiming to cool our milk as fast as possible. We do not object to cooling, but we object to aerating.

Mr. McKinnon: Can you cool the germ with the air?

Mr. Noyes; No, but we want to take out the animal odor.

Mr. McKinnon: We do not find fault with the animal odor, it is the germs that we object to.

The Chairman: I understand experimental tests have been made in Chicago by the Bureau of Agriculture of Washington, where I understand two Wisconsin men have shown up brilliantly. I would like to ask Mr. Kasper and Mr. Johnston whether milk is injured by cooling or aerating?

Mr. Johnston: As far as my experience is concerned, I would like to have it cooled, I would like to have it aired; it certainly does not do harm; but if a man was to do but only one of the two, I would rather he cooled it than aerated it, especially in our country, where it is so warm. I have had a man bring milk to me all summer long, two or three times a week. They are nice clean people, and he keeps his cans clean, and he shoves those cans right into a spring of water, and they are covered, and when he takes a notion to come over, he hitches up and drives over; very often that milk is brought in in the evening and allowed to stay there in the vat all night and when

he comes in the morning we always take that milk for a starter and have been taking it for two years, and he is living about seven miles from the factory, and I have never received any bad milk from that man, and I honestly think that if milk is cooled, I believe it is better to aerate it. I believe that it should be aerated and then cooled, but if I have my choice of the two, and I could do only one, I would have the milk cooled rather than aerated.

The Chairman: Do you think in the case of this particular patron that from the time he milked his cows until he placed the milk in the spring, that the milk had any opportunity of being contaminated with foul odors?

Mr. Johnson: No, I do not think so. They are very neat and clean and all the surroundings are clean, but not so much more so than the ordinary. The milk was placed in shotgun cans and shoved down into the spring and left that way until taken to the factory. I think it makes all the difference in the world what kind of homes the patrons have, etc. Mr. Noyes spoke about cooling the milk years ago; I think they have changed the way of making cheese; they did not know how to make cheese years ago.

Mr. Noyes: We have changed our milk too.

Mr. Johnston: I think there is more in the change you made in the way of making cheese than there is in the way of cooling and aerating the milk.

Mr. Noyes: I admit we have changed the way of making cheese.

Mr. Kasper: My milk is taken care of from the factory. The milk is cooled and aerated both; first run through the aerator and then put into the coldest water. I get the best milk of any factory in this state.

The Chairman: You have got one of the nicest factories, too, Mr. Kasper.

Mr. Noyes: Everybody in our country uses aerators. I do not think there is a man in the country that does not send milk without using the aerator and without having it cooled.

PREPARING STARTERS AND RIPENING THE MILK.

Hugh Nisbet, Madison, Wis.

The subject assigned to me is a very important one, for on a starter the flavor and texture of the cheese greatly depends.

A pure culture is the best because it can overcome the undesirable fermentation to a greater extent, and has more effect in the ripening of milk. It ought to be made from skim milk, if obtainable, for it can be made more uniform and will sour evenly from top to bottom. Nearly all cheese makers have to use whole milk as it comes to the factory, and it should be the best and purest, preferably morning's milk. The utensils used in the work must be good, kept thoroughly clean and sterilized every day.

In starting out, get four pounds of milk, and pasteurize to one hundred and sixty-five; hold for twenty minutes, then cool down to seventy, and add a bottle of latic ferment. The temperature at setting should be that which will give the proper acidity the next morning. This four pounds will be enough to add to forty pounds of pasteurized milk which should be set in the evening so that it will be ready for use next morning; then you have a starter which will be good as long as you use clean cans, pure milk, and set at the proper temperature.

Always skim off the top before stirring up, as there are apt to be some undesirable germs dripping into the starter can from the surroundings; then save out one pound of startaline for every ten of the starter to be made; at this stage it ought to be smooth in stirring, have a clean, sharp flavor and about five or six tenths of one per cent,. of acid.

The ripening of the milk requires great skill in order to have good results. In summer, when the milk has a tendency to be fast working, it is best to make a rennet test early before adding any starter; if it has enough acidity, do not use any. If it is bad and off flavor, a good starter will aid greatly in overcoming the difficulty and make a better cheese in every respect. In fall and winter when the milk comes in sweet, the starter ought to

be added early, and the milk heated up to eighty-six. This will give the lactic acid a chance to develop and often get the vat set an hour or two earlier. Care must be taken to stir the milk smooth and regular in heating. The proper amount of starter to be used is that which will give the best result in the quality of the cheese, and very often will not vary far from one per cent.

Cheese made from milk with a pure culture does not need as much acid in the manufacture as they have a tendency to develop more in the curing, and using too much starter is a great mistake, as it will make a weak body, a dull, whitish color which is readily rejected by the buyer.

DISCUSSION.

Mr. Alves: How long do you gentlemen hava a starter run before you have to renew it? That is, working in your factory, not in your experimental station.

Mr. Nisbet: Well, I do not always make a pure culture in the factory in the summer. In the fall I have made it and have run it as long as I needed it.

Mr. Alves: You said you would use a starter provided you had gassy milk. Now, when you take your milk in, do you know whether you are going to have gassy milk?

Mr, N.sbet: No, you cannot always tell, but you have a good idea from the way the milk is working.

Mr. Alves: My idea is to put the starter in at all times, because we have got a better starter than any one could furnish us.

Mr. Johnston: It seems to me you would be out of a starter most of the time according to that, because it would take you three days to make a starter, and the probability is, before those three days are over, your milk would be good again, so you would not need it. So I think if you advocate a starter, you must use it all the time, or none of the time.

Mr. Nisbet: I think it is proper to use it all the time.

Mr. Alves: Which do you think is the best, the home-made starter or the lactic ferment?

Mr. Nisbet: The pure culture I believe is the best.

Mr. Johnston: Did you ever have any experience with diluting milk, that is, cold cream milk by adding water to it instead of skimming, and having very good results?

Mr. Nisbet: I never tried it, I never added water to a starter.

Mr. Johnston: I have tried that, it makes the starter more mild and it is not as strong, and it seems to me we can keep our culture longer that way, by adding a little water before pasteurizing it. After we add the water, we pasteurize.

A Member: Why not add the lactic acid and not use the water?

Mr. Johnson: That may be all right enough, but it seems to me it is pretty hard work sometimes to get it as free as we want it. I find the better starter is made by adding a little water.

Mr. Noyes: That is a point where most people have to be careful. He states it is all right, he pasteurizes it after he adds the water, and takes the germs, if there are any germs, out of the water. Now, a person must be careful about that, and not add water afterwards and not have it pasteurized, because you know we have often typhoid germs and things of that kind that are in the water, if you are not careful to add that before it is pasteurized, you are liable to get bad results. I know a cheese maker that adds water that is not pasteurized after the milk has been pasteurized. Now, that is going contrary to the results that have been obtained. A great many cheese makers do not like a ferment for a starter, do not know how to keep it pure, and they do not have good results from it. I know cheese makers that adways have had good results from it and sometimes a man does not have and you cannot teach him.

Mr. McKinnon: He says by adding this after the starter, if you do not want to sour it quite so much, because the acid will still continue in the cheese, am I right after the cheese is made?

Mr. Nisbet: They will develop some acid after they are made.

Mr. McKinnon: Now, I would like to find out if acid really

does develop in that time with this lactic ferment that we have added, this additional starter, or is it because we have failed to get the whey out of the curd? Is it not a fact that we have cooked up too rapidly? You know a cheese maker likes to get his curd out of the whey inside of an hour and a half. Now, this starter has a tendency to make it necessary to get that out of the whey in a short time, and by hurrying it up in that way, do you not make the other mistake of failing to get the moisture all out, or that part of it remaining in the curd before it is taken out of the whey. A few years ago, we had a man in our section of the country who came from New York state and he laid down this principle for us, after bringing us up to that: First, get the whey out of the curd and as soon thereafter as you can, get the curd out of the whey. Now, you see that does not sound very much different, but there is a great deal of difference. First get the whey out of the curd—how are you going to get that out? You have got to cook it out. Now, this lactic ferment, this starter, and cooking it for an hour, or an hour and a half in order to get all the moisture out that we should have gotten out in the first place, what will be the result? We have what we call in our section of the country a soft sort of a cheese.

Mr. Moore: What is your reason for thinking that a pure culture starter is better than a lactic ferment starter?

Mr. Nisbet: Well, it has got the pure lactic acid, and that is what we want in cheese making.

Secy. Baer: Do you consider the Douglas, that we use in butter making, a desirable flavor to be used in milk to make up into cheese? Would you recommend using it?

Mr. Nesbit: I prefer the Hansen's.

Mr. Johnston: Last year I saw a starter that ran over two years, and I presume it is running yet. Mr. Millar may know of it, it was at Bright. Mr. Noyes asked about whether they added water to the milk at the time they added the lactic acid. When they started originally, the operator put the water in every day, and then he put in his lactic acid and it is one of the finest starters I have ever seen. I believe with this gentleman right here, that water is a good thing. Mr. McCready says, why not

add less acid? You have not always got control, you do not know what the weather is going to be, whether the starter may get sharp or not. After what experience I had with it, I found out it was a very good thing to add, as the starter does not go off half as quick as it does when you do not use it, because when the weather gets warm and you have not a good place to keep it, it gets too sharp for you. I would like to hear from Mr. Millar on that; they use water over there I believe, and I think it is the proper thing to use.

Mr. Millar: I might say that one or two of our factorymen have been successful in carrying a starter over two years. In reference to this one at Bright, I am not quite sure whether it is still in use, but I expect it is; I have not heard anything different. We always use water in making a starter and as a rule it is put in before the milk is pasteurized, so as to be sure that if there is anything there in the water that is not right, we destroy it. The Bright factory is well equipped and in a sanitary condition, and everything that could be desired, good water and so on, therefore it is not absolutely necessary, but we take the precaution to have the water pasteurized with the milk. We use about one-third of water, one pail of water to two pails of milk, and there is another advantage in working up your starter. We find that we can make a very nice smooth starter with additional water and use all whole milk. Very often it is a little bid harder and more lumpy to get down into smooth consistency such as we like. We use a culture prepared at the Ontario Agricultural College and get excellent results, in fact, you can carry a starter as long as you care to, and there is a clean man in connection with it. I might say some of our makers prefer using four or six small cans instead of large cans for the pasteurizing. For instance, if you want to use a certain amount of starter, you can use one of these cans to-day and preserve it until you care to use it. In that way it is not necessary to make a starter every day, you can carry it three or four days, and still have a culture. I think that is better than putting your starter all in one can. Now, I will not say to use a starter every day; I do not think it is necessary in our country at least, of

course conditions differ, and I would not for a moment lay down for you cast iron rules, but I will say in our country we find that about six months in the year but very little starter is required; you will find that nature supplies sufficient lactic acid so that it is not necessary to use the starter. We find that the maker who is anxious to use a large starter and hurry the curds off the vat is very apt to get rough, mealy cheese. You cannot develop a curd in an hour and a half and make a fine cheese. Sometimes it is necessary when the milk is very ripe to hasten the process, but when it is not necessary, it is best not to do it.

Mr. Moore: I would like to ask what means he takes to preserve the starter in order to carry it three or four days so as to have a nice starter on the fourth day when he is going to use it again.

Mr. Millar: The starter is simply left in the cans and kept at a fairly low temperature. These cans are kept covered up tight and left there until you want to use them without disturbing them. When we come to use the starter, we take out probably two inches of the surface, we skim that off before breaking it up, so that if there is any contamination in the air, we get rid of it in that way.

DRAWING OFF THE WHEY AND HANDLING THE CURDS ON THE RACKS.

F. F. Zimmerman, Mt. Horeb, Wis.

Mr. President and Fellow Cheese Makers:

I feel that the subject assigned me,—Drawing Off Whey and Handling of Curds on the Racks—is one of the most important features in the manufacture of Cheddar cheese.

Good judgment is an essential factor that comes into play at this point of cheese making and a cheese maker not qualified with the ability to determine when his whey is ready to draw can not be classed as an up-to-date cheese maker.

The first question to be determined is, when is the whey really ready to draw? Here we again ask ourselves: 1st. Has the curd the proper cook? 2nd. How much acid should it have?

The first point that comes into consideration is acid. Under normal working conditions a curd when ready to draw should have one-eighth of an inch of acid. This is readily determined by the use of the hot iron test. These strings are due to the softening of the casein by the acid. Thus, the more acid there is deeloped the longer the strings will spin on the iron. Again, we do not measure acid by the inch. The hot iron just indicates when the whey is ready to draw. Curd showing one-eighth of an inch of threads on the iron has two-tenths of one per cent. of acidity in the whey.

The cook comes into consideration next, before the whey is drawn. A proper cook should feel firm and elastic to the hand but not soft and mushy, and when a double hand-ful is taken up it should fall readily apart. At this stage of the process we must work nimbly. Our rennet test will show us the condition of the milk, and we must know how to out our curd, and what to cook it at, to obtain the best results. The curd particles should be examined from time to time, as this will give us some idea whether it is being cooked too rapidly. Whey will not expel from curd at a temperature of 86° to 90° as fast as it does at a higher temperature, therefore, one degree every five minutes is fast enough in the beginning. A curd cooked too rapidly at the beginning hardens the curd particles on the outside, consequently, the whey would not be expelled, resulting in the whey-soaked or mottled cheese. In over-ripe milk, the curd must be cut finer, cooked higher and much faster, depending largely on the amount of acidity in the milk. Shoulu the acid develop faster than you get your cook, the whey should be drawn as soon as possible, enough so that the curd can be easily stirred with the rake and warm water can be added in its place. This checks the acid and gives the curd a chance to firm up.

After all abnormal conditions have been looked into, and your curd has the proper cook and amount of acid, I consider the whey ready to be drawn.

The whey should be drawn as rapidly as possible as soon as conditions are favorable, as here is where the beginning of a good quality of cheese takes place. The curd is pushed to the upper end of the vat and after the whey is well drawn it is pushed back to the lower end and the vat tilted. In the space cleared racks are put, upon which a stainer cloth, ten or twelve feet long, is spread; the cloth should be wide enough to lap over the sides or the vat. Upon this the curd is dipped, and after it is well stirred through it should be evenly spread five or six inches deep. The edges of the strainer cloth are then lapped over on to the curd and left to mat. In ten or fifteen minutes it is cut into blocks and turned every ten minutes.

A temperature of from 96° to 98° should be maintained, as we must remember that Cheddar cheese making is a process of fermentation and the temperature at different stages should not be neglected. This is easily done by inserting a steam hose under the cover of the vat, being careful not to have the steam strike the curd directly. Warm water is also used by putting it under the racks.

After the curd has been turned three or four times it can be piled three, four, or five deep, being careful not to spread the blocks too much at first. In the meantime, it will assume a meaty texture, and should feel elastic to the touch.

Piling curds makes a fast curing and weak bodied cheese. To obtain a good bodied or long keeping cheese, the curds should be piled very little and in some cases not at all.

Pin-holey, or gassy, curd must be piled a good deal in order to get rid of the gas; also more acid is required to overcome these undesirable flavors, both in the whey and dry acid on the racks. A good starter helps to overcome this, and it is better to have a little extra in a case of this kind than not enough. A little more starter than is usually needed in normal working milk helps wonderfully. Should this fail, my advice would be to call on the State Travelling Cheese Instructor or attend a term at the Wisconsin Dairy School.

DISCUSSION.

Mr. Alves: I would like to inquire why he piles his curds so deep when they are pin-holey.

Mr. Zimmerman: To get rid of these pin-holes, it spreads them out.

Mr. Alves: I always thought it was a very good idea, it probably is, but I find the sooner and the more you can expose the curd to the air and get it ground up fine, thoroughly, the sooner one can get rid of the bad odors and the pin-holes seem to die out by the grinding and working.

Mr. Zimmerman: Well, I pile a great deal at the start, until I get enough acid and then grind and air as much as I possibly can. I try to get all the acid I possibly can by piling.

Mr. Mason: The piling of the curd ruins the texture of the cheese, and doing as Mr. Alves says, exposing it to the air and grinding it soon, gives you a better texture of cheese than it does to pile it too high, in case you have an off-flavor or a pin-holey curd. It all depends on what kind of a market you are manufacturing the cheese for. If you have a market that calls for a soft cheese or fast-curing cheese, I would pile my curds a little. If I had a market that wanted the slow-curing cheese, I would pile them very little. In some cases I would not pile them at all.

Mr. Alves: It seems to me we ought to make a cheese in Wisconsin that would stand up anywhere, and if you make a good cheese, it will go anywhere, but if a soft cheese is made you had better stay off the Boards of Trades.

Mr. Bachmann: I was obliged to make soft cheese this summer for the man that bought my cheese.

Mr. Millar: Your idea is to develop acid?

Mr. Zimmerman: Yes.

Mr. Millar: After you have developed sufficient acid, then expose your curd to the air?

Mr. Zimmerman: Yes.

Mr. Millar: I think our friend, Mr. Alves, will find some trouble in getting rid of these pin-holes, unless he develops suf-

ficient acid before his milk ripens. That is always our experience, that you have got to develop a certain amount of acid, then after that the airing is a good thing, but until that time we prefer to keep our curd working and develop the acid.

Mr. McKinnon: Is there any way of handling that pin-holey curd so that there will not be any great loss in yield? Do you not find that in having that kind of curd that we are discussing now, that the yield is unsatisfactory?

Mr. Millar: Certainly, the more you work the curds, the smaller the yield.

Mr. McKinnon: Supposing that the curd is pin-holey and you want to get the air out of those pin-holes and you are going to work on that curd, there is going to be quite a loss, I do not know how much, but in some cases we find it to be quite extensive. It has been a question with me lately whether we had better just go ahead and make it up as it is, the pin-holey curd, have a pin-holey cheese and take it onto the market and sell it as pin-holey goods. We will have to sell it for a little bit less, half a cent less, we have got a better yield, however, sell it for half a cent less perhaps, but the yield is enough to make up that half cent, so that if I am correct in the premises, what is the use of going to that work, why not make it up into that kind of cheese? Don't you see by the quotations in the paper that there is a great scarcity in Chicago and throughout the United States of poor cheese, they can hardly supply the demand.

The Chairman: I have seen cheese makers knock off four or five cents for pin-holey cheese.

Mr. Noyes: I think Mr. McKinnon ought to get a gold medal on that.

Mr. Alves: When I air my curd, I know pretty well where I am airing it.

Mr. Noyes: Do you get pure air?

Mr. Alves: Well, I try to get it, and of course I have had experience that it worked very well that way. Of course if the curd is matted, it is different, it has to have a certain amount of acid, but I find where the curd is matted in that way, I did not have as good a yield as when I tried it twice or even three times

with iced milk, and it made a good texture and just as good cheese as any one can make out of such milk, and where you mat it so much, you have got to keep it warm, if you do not, you have got to work it all day and all night, and I do not like to do that, and in this way it hastens the work and does a much better job.

A Member: I heard from a Canadian professor some years ago that he thought he had the best yield by piling the curd flat, thin. I would like to ask Mr. Millar if he has had any experience in that regard.

Mr. Millar: In years gone by it was thought that we had to bring our curd down like sheep skins, quite as thin as that, that was the custom in vogue in a great many factories in Ontario, but since that time we have learned better, we have learned that that is not absolutely necessary, but we mature these curds until they will show say an inch and a quarter to an inch and a half of acid, and are flaky before milling, then expose them to the air sometime and pile them up again, keep them piled and separate alternately, stirring every time they are separate.

Mr. Helm: Do you not think the cheese will get mealy?

Mr. Millar: In case of a pin-holey milk, we gain time by piling; if we have a curd without these gas-holes or pin-holes, I do not think it is necessary to pile them, but I do not see any damage in piling them. Pile and turn them often enough, so that the whey will not stand on the curd.

Mr. Helm: I think a lot of this gas can be remedied by washing it at dipping time with good, pure water, that will take out the pin-holes and all flavors.

Mr. McCready: At racking or dipping time, it is all right to rinse off in order to take off the excessive amount of acids, providing you pour it into two vats, in case you have any pin-holes or gas.

Mr. Helm: Gassy curd has not got any acid at dipping time.

Mr. McCready: Oh, yes, it has.

MILLING, OR GRINDING, AND SALTING OF THE CURD.

Chas. Gartmann, Sheboygan, Wis.

It is with great diffidence that I advance my ideas on Milling or Grinding and Salting of the Curd before this experienced gathering. As my time is limited my remarks will be few, but may contain some suggestions on the value of which I am perfectly open to conviction. I prefer to grind or mill the curd some time before it is ready to be salted. When it is sufficiently ripened for grinding it will show a deeper color than when put upon the racks, and the color will be nearly even when the curd is cut apart. At this stage it will show about ¾ to 1 in. of fine threads on the hot iron.

After grinding I stir the curd for about 20 to 40 minutes and in hot weather I cool with cold water under the vat and also rinse or wash it with cold water. If the flavor of the curd is good I don't use much water on it, but if bad I use about a pailful for 1,500 lbs. of milk. In cold weather I use warm water instead of cold. After draining the water from the curd and after it has attained a temperature of 92 degrees it will gradually loose its springiness and become soft, and when a handful is squeezed for about 15 seconds it will retain its shape. The curd is now ready to be salted.

Early in spring I use about 1¾ lbs. of salt for 1,000 lbs. of milk. This ammount I increase gradually to 2½ lbs. later in the season. In some instances 3 lbs. of salt for 1,000 lbs. of milk should be used, that is if the curd contains much moisture. Curd which contains much moisture or whey should be salted more heavily than dry curd as salt will expell the superfluous moisture. Too much salt will cause the cheese to cure slow and become dry and mealy.

When ready to salt spread the curd out evenly on the bottom of the vat, scatter about half of the salt over it, stir it in well, spread out again, add the remaining salt and stir it in.

The salt will cause the curd to become springy and harsh

again, but after it has been salted about 20 minutes and having been stirred occasionally it will become soft and velvety again when it is ready to be hooped and put to press.

DISCUSSION.

The Chairman: I would like to ask the gentleman how long he can keep his curd lying in the vat after he has dipped it, until salting time.

Mr. Gartmann: That depends on how it works, if it takes acid fast, when it shows about three quarters of an inch to one inch, it is all right to mill.

The Chairman: How many hours from the time of dipping?

Mr. Gartmann: From an hour and a half to two hours.

Mr. Mason: The idea of rinsing with cold water is rather new, at least it is to me; I have always been taught to rinse with hot or warm water.

Mr. Gartmann: I use cold water on the curd in hot weather. If the weather is very hot it cools the curd, and I think I do not lose so much fat.

A Member: Is the object of that to check the acid, or what is the object?

Mr. Gartmann: It is not the idea to check the acid, it is to get the curd cooler. The warmer the cheese curd is the greater the fat will run.

Mr. McKinnon: You do not do that at the time of grinding?

Mr. Gartman: I do it right after grinding. I think it is a better plan to run it through the mill and work it for awhile, run it about twenty or twenty-five minutes; it is very seldom that I work it thirty or forty minutes.

A Member: How often do you turn while on the racks?

Mr. Gartmann: Turn it every ten or fifteen minutes.

Mr. McKinnon: You have no particular number of times that you turn?

Mr. Gartmann: No.

Mr. Alves: Did you ever experiment with cold water, putting it on the curd direct, that is, after putting it on the racks?

Mr. Gartmann: I used to put cold water on while dipping, after the whey was off, but I do not like that very well.

Mr. Alves: Now, I have tried—when I have a fast working curd and you cannot help this sometimes. I took the curd and run the whey off as I have a chance, as much as possible. Then I run the temperature up to 108 and keep it there and when the whey is on and ½ inch of acid is shown by the hot iron, then I reduce it with cold water down to 98 and put it on the racks. I found that I made a cheese that was all right.

Mr. Gartmann: I have never done that; I remove the whey, then wash it with water that was about 108 to 110, that firmed it.

Mr. Alves: That is good practice, too, but at the same time when you use warm water and you put the curd on the rack, it is likely to warm so much and you cannot expel the whey as well as if you cooled it down to 98 or 100, it will be nice and hard and at the same time you have got a good start of acid and will not make a soft salvy cheese, provided you use salt enough to take up the moisture that is left after that.

Mr. Mason: How high do you pile your curd, how many tiers?

Mr. Gartmann: Hardly ever pile higher than three deep.

Mr. Mason: Is not one tier better? Just turning it over, not piling it at all?

Mr. Gartmann: I do not know.

Mr. Mason: I find that piling the curd, just turning it over, not piling it at all, makes the best bodied cheese. It takes a little bit longer to make the cheese that way, but I think you get a much better bodied cheese by not piling it at all, just turning it. That is my experience.

PRESSING AND BANDAGING CHEESE.

Chas. Pickard, Muscoda, Wis.

Mr. President, Ladies and Gentlemen:

It is with pleasure that I meet with you in convention. We have met here for the advancement of the cheese industry, and if we all take part we will make this an ever to be remembered meeting.

We all have our method of handling good and bad milk and much is to be learned and is being learned every season.

The paper assigned me while perhaps not as interesting as the preceding ones is very important, for herein lies the looks of our finished or well-made cheese. The greatest factors of my paper are the press and the hoop. The press I find is often condemned and accused of making the cheese crooked when it is all the fault of the maker. I find some that when they get the curd in the press their next thought is to get out of the factory as soon as possible, and the pressure is applied so severe the cheese can do nothing else but go crooked.

While we are maturing the curd in the vat we find time to prepare our hoops ever striving to keep ahead of our work. We have our bandage on a reel in a convenient place and cut it from between two hooks so it is perfectly straight and of even length. Gather up our end and give it a good twist and when we place them on the bandages this end falls to the bottom in nice fine pleats. The press cloth (should be of heavy material) and circle have been placed before the bandage is put on so that the lower end is finished.

Add the curd so the cheese will be of same size and if the folders fit good and pieces of tin have been tacked over the holes where the hookeyes have pulled out we do not put the press cloth on the first time pressing. My reason for this is the cheese does not face without the cloth and thereby the loose whey will be pressed out with less pressure and give the cheese a chance to press slow and get started straight. After twenty or twenty-five

minutes of light pressing or before the curd gets pressed into the bandage too much they are ready for dressing.

Avoid getting the upper edge of the bandage soiled. But I find using the common galvanized hoop; this is hard to do if they have been used long, for when the galvanizing gets worn off they will rust and I have failed to find anything to prevent it. Pull the bandage lightly but not enough to start the lap that was left at the bottom but enough to remove the wrinkles. Remove all ravelings that will make the cheese look mussy for if I have not made a good cheese I am expected to make it look nice and that will help sell it.

Let the pressure be increased often untill the last act before retiring when it should be applied good and hard, following it up the first thing in the morning.

In removing the cheese from the hoop a common table knife run around the side of the hoop will free the cheese and they will drop out and thereby avoiding pounding. Remove all soiled spots before putting them on the shelves, follower end down.

DISCUSSION.

Mr. Alves: I would like to ask the gentleman if he has had any experience with the self-pressure?

Mr. Pickard: No, sir, I have not. I believe it would be a fine thing though.

Mr. Alves: We have an invention in our neighborhaad of self-pressure; after we get our cheese compressed and put on that pressure, we have no more trouble.

Mr. Pickard: I think that is all right.

Mr. Alves: There is no leakage of cheese, or anything about it at all.

Mr. Mason: I would like to ask Mr. Pickard at what temperature he presses.

Mr. Pickard: I like to put cheese in the press at a pretty low temperature, not above 80.

Mr. Noyes: I would like to ask if he can close them up properly at that temperature?

Mr. Pickard: I have been able to.

A Member: I would like to ask the gentleman how he keeps them down to 80 after he has them solid, if he puts cold water on the hoop or not, keeps the cheese cool in the hoop?

Mr. Pickard: Of course it is a hard matter where the surrounding temperature is 100 or 102, sometimes 110, it is a hard matter to cool a curd down, but by exposing it to the air, it will eventually get cooler than the surrounding atmosphere, and I do not think that a little dash of cold water in order to get it down to that temperature, does any harm.

The Chairman: Do you not think that water under the vat and stirring the curd would have a better effect?

Mr. Pickard: Yes, I believe it would; they have not got the vats made for that.

A Member: What is the objection to putting it in the press warmer, putting it in at 85 or even 90?

Mr. Pickard: I do not know.

The Member: They used to teach us to cool it down to 70 or 80, they told us if we did not do that the butter fat would always run more. My experience of late is that it does not make any difference how warm it is; I do not see that the butter fat runs worse, or not even so bad. The cooler I got my curds, the last few years, the worse I have thought the butter fat ran. I do not know whether that is the experience of others.

Mr. Alves: Do you not think that 80 degrees is low for putting cheese in presses for cold weather?

Mr. Pickard: For cold weather, I think likely it is a low temperature.

Mr. Alves: I would like to ask Mr. Pickard if he reverses his cheeses in the hoops?

Mr. Pickard: No, sir, I do not.

A Member: I would like to ask the gentleman whether he pours on the water before salting, or after salting.

Mr. Pickard: After salting.

The Member: Do you not lose a lot of the salt then?

Mr. Pickard: I do not think so. What brine is washed off at that time I do not think cuts any figure, I do not think there is much loss.

Mr. McKinnon: I want to tell you how we press our cheese up in our section of the country and we never have had a cheese since we have started in to use a self-press, but what was in good form. We do not touch that cheese from the time when we screw it up and tighten it until we take it out of the press next morning, we have that continuous pressure on it, not a severe pressure, although you can make the pressure as great as you have a mind to, until we get ready to take it out, and when we get ready to take it out, we are sure that it is closed up.

Mr. Noyes: It seems to be my fate to differ with Mr. McKinnon. If Mr. McKinnon will press some of the cheese in our section with continuous pressure, without any water, I will buy a press of him for our factory.

Mr. McKinnon: Without what?

Mr. Noyes: Without washing with hot water, because our curd is so greasy you cannot throw it off, they have got to be washed, some curds have got to be washed before you can close them up, I do not care what kind of a press you use. We have some kinds of bad curds which are floating or pin-holey and we cannot work and develop our acid without starting the fat. Our curds are greasy and if you put them to press, you never could close them if you did not wash them off and use hot water. We sometimes have to take our cheese out of the hoop and wash it off with a brush to take that grease off before putting it back to the press. We have some of the other kind in hand, good curds, that can be closed up without washing, but in hot weather, if you want a perfect rind you would have to wash out the fat before they would close properly.

CURING OF CHEESE.

V. M. Scott, Stockbridge, Wis.

The curing of cheese is the process of fermentation, whereby the insoluble curd is converted into soluble peptones. Cheese will cure slowly at low temperature and be of fine flavor and texture. As the temperature is raised the cheese cures faster. At about 60° F. the most rapid curing takes place, at which a good cheese can be obtained. A temperature of 70° F. or about 65° F. for any length of time will injure the texture and flavor. The flavor growing sharp and strong as the cheese ages. A temperature of 80° F. starts the fat, the shrinkage is great and gasses are formed which open up the texture or body of the product. The very finest made cheese and the most clean, perfect flavors will soon be ruined at these high temperatures, too often found in the poorly constructed factories of this state. The Wisconsin Agriculture Experiment Station has demonstrated that the best curing temperature is in the immediate vicinity of 40° F. Cheese cured at this temperature breaks down slowly, resulting in a smooth, waxy texture, close meaty body and fine low flavor. The flavor is mild but of a lasting aroma. Where a higher or more snappy flavor is desired the cheese may be subjected to the higher temperatures and the flavor intensified to any desired point, or to meet the taste of any trade.

This subsequent curing at 60° or 70° F. for a few days does not seem to injure the quality of the cheese with reference to texture and body if fully cured at the lower temperature before being subjected to the high temperature. New cheese placed from the hoop at 70° F. developes off flavors, but this is not true of old cheese when placed at high temperatures for the short time necessary to develop the sharp flavors desired by some cheese eaters.

Another important advantage in the so-called cold curing process is the saving in shrinkage. The loss in weight in rip-

ening is lessened. I do not want you to think that I advocate loading a cheese with water. But cheese should contain sufficient moisture to give that smooth silky texture and not the dry, mealy, crumbling body quite often met with. The air should have as much moisture as it will hold without moulding the cheese. In rooms well ventilated where a constant circulation of air is obtained, from 80 to 95 per cent. saturation will not be found any too high. I do not believe in attempting to cure cheese with scarcely no evaporation or loss of water contents. The cheese must dry sufficiently to form a good heavy rind.

A good heavy rind is essential at all times and especially when cheese are placed in storage. If no evaporation has taken place on the outer surface of the cheese the rind remains as tender or nearly so as any part of the product. Such rinds soon soften and spoil in storage, especially with cheese held two in a box.

Curing rooms should be constructed so as to admit of letting in plenty of fresh air. Cheese needs a generous share of fresh air to make it cure properly and produce a good flavor. Cheese do not cure as fast nor as clean in flavor when boxed as they do when open upon the curing tables. Cheese should be turned every day while new to form perfect rinds and insure uniform ripening. I shall not attempt to tell you anything about the proper construction of the curing rooms as that is not a part of my subject. You have a number of authorities here who are experts along that line and can handle that important subject in discussion.

DISCUSSION.

Mr. McKinnon: You say that you think the cheese ought to be put on the shelves and aired, subjected to good, pure air, and all that sort of thing. Now, don't they in some parts of the country rush their cheese off just as fast as it is made and put it into cold storage and aim to have it mature at a certain temperature and without any air of any kind, leave it in the boxes, paraffine it to exclude the air fully after paraffining it?

Mr. Scott: Perhaps, but that is not the way we are taught at our school. I never had any experience in the line of paraffining cheese or putting it in cold storage, fresh cheese, I could not say anything about that.

Mr. McKinnon: I would like to have that question of paraffining discussed a liltte bit, because there are parties up in our part of the country that are paraffining cheese and putting away in boxes and selling them to the buyers. I have not heard any fault found by buyers and it saves a great deal of work, but it does not expose the cheese to the air, which is so necessary.

Mr. Alves: There is a brother of Mr. Scott's here who knows something about paraffining cheese, and when he has a pin-holey curd he puts it up into cheese and the cheese come out all rigth. He does not look for pin-holes, whether they were there or not. When ready for shipment to the warehouse, they were paraffined before they were sent out. He said they developed a fair flavor, he could not notice anything particularly wrong about the cheese, and I commenced to practice that myself, after three days I paraffined them, and it seems to me it is a better cheese, because it does not dry out as much, the rind will not be so hard and there is not so much loss.

The Chairman: Let us discuss this paraffine question a little while. That is one of the subjects that we ought to bring out.

Mr. Anderson: I think a man told me yesterday that he had used a half pound of paraffine on forty pounds of cheese.

The Chairman: What difference does it make as long as you get 12 cents a pound for your cheese?

A Member: If you have a bad flavored cheese, would it work out as well as if it were not paraffined?

Mr. Alves: It seems to me if it is taken at the right temperature, at a low temperature, the lower the longer it takes to cure the cheese, the better the flavor would be, that is one sure thing, and I do not see why a paraffined cheese will not cure out all rigth, of course if it is paraffined, it will take longer to cure it.

The Chairman: Is cheese paraffined in Canada?

Mr. Millar: Not until they get it into storage.

The Chairman: Do you think they cure as quickly when they are paraffined?

Mr. Millar: I do not think so, I do not think the paraffine has any effect on the flavor. We know that if we put a cheese into a room at a low temperature, if we do not develop bad flavors in that cheese, the very fact of paraffine does not have any influence at all.

A Member: Mr. Noyes here has been trying this all along, and I believe he has sold out pretty nearly all his cheese this fall, and he paraffines them all when they were put in storage, and they were gone through by Chicago buyers and others when they were bought this fall, and I think he ought to have a good idea of whether that benefitted the cheese or not.

The Chairman: Will Mr. Noyes tell us how soon after he took the cheese from the hoop he paraffined?

Mr. Noyes: We have paraffined all the cheese we put in storage, and we had very nice results. The worst results we had were with the first lot, which we paraffined with the circles on; we found they contained a large amount of moisture under the circles, but we found that those circles can be removed at the time of cutting and the moisture scraped off and the rest of that cheese will be nice, but still the circles should be removed in paraffining and we find we get a little better flavor with our cheeses that are paraffined about fourteen days after they come from the press. We find those that are paraffined immediately, or one or two days after, that the cheeses develop sometimes a little sweet flavor, not a bad flavor either, but just a little sweetish flavor that we noticed in all of the cheeses that we paraffined immediately from the press, but Mr. Simon paraffines all his varieties of cheese when they are not older than three days, and they pass inspection right along, I think, but I think when cheeses go into cold storage they should be paraffined, you save the shrinkage, save the moulding, save the moisture, and I think you get a better flavored cheese with that moisture retained.

The Chairman: Do you approve of paraffining cheese immediately after taking from the hoops?

Mr. Noyes: No, sir, I would not.

The Chairman: What would be the objection?

Mr. Noyes: Well, I think it would change the flavor a little.

The Chairman: Don't you think it retards the curing of the cheese?

Mr. Noyes: Well, I do not know, a cheese cures out so quickly that there is a little sweetish flavor in those that we handle that way that has not pleased us.

The Chairman: That is an objectionable feature, is it not, the sweet flavor?

Mr. Noyes: Yes, I think though that our trade can be educated to that flavor; it is not at all what we should call a sweet flavored cheese, that is, a tainted cheese, but a sweet flavor.

The Chairman: Still you would consider it an objectionable flavor?

Mr. Noyes: Yes, I would at the present time.

Mr. McKinnon: That particular sweet flavor that you speak of, do you find that in all parts of the year?

Mr. Noyes: No, sir, about the 15th of May up to the 1st of December.

Mr. Mason: I would like to ask Mr. Noyes why he would remove the cheese cap and not the bandage?

Mr. Noyes: It seems to me most natural, especially after some cheese comes from the hot air to go into the cooler, that the evaporation takes place upwards and not sideways. It seems to be more natural, the moisture takes that form. Then if we have not got a rind, it does not let the moisture pass out and as you put on the bandage, the moisture all seems to go up, it is natural to go up, and I think you get that result, so that we remove our circles, and I think it would be just as well if the bandages were removed, in fact, some are removed in certain kinds of cheese that are moist, they remove the bandage as well as the circle, especially in a hot atmosphere.

A Member: I would like to ask if they have any cheese that has grease on the edges.

Mr. Noyes: Yes, we scrape the grease off.

Mr. Anderson: I started in with paraffine and I have found that the cheese has to be dry, I save my caps and save my grease,

I leave the press cloth on the cheese, and make them firm and dip them and put the cheese on the shelf or in boxes, and I use the caps over again, and the press cloth. I bind the cheese that way that they do not shrink after you have dipped them, or very little.

Mr. Michels: I would like to ask the gentlemen how he does the paraffining in the factory, what method have you got?

Mr. Noyes: I have got a boiler, a large boiler and a small boiler to go inside of that, and I pasteurize both for preparing starters. Now, since cold weather started, I do not pasteurize my starter and then I use that boiler instead for paraffining, put that on the cook stove and dip the cheese into that. Heat the paraffine and the water both. Both have to be at the boiling point.

Mr. Dassow: I would like to ask Mr. Noyes if these cheese after being on the shelf three days can be cured without shrinking any by dipping in paraffine?

Mr. Noyes: Yes.

Mr. Dassow: I would like to ask Mr. Noyes at what temperature he has the paraffine and how many times he dips after he puts the cheese on the shelf. Does he turn them again after he has them on the shelf, or does the cheese remain there without turning?

Mr. Noyes: If I had them in the factory, I should turn them occasionally, twice a week, especially if you have a temperature in your room that is liable to huff your cheese a little. If they huff a little they will certainly break that paraffine. It never did it with us but once. Our paraffine is just as hot as we can get it; they are simply dipped in and taken right out and put on the hook and dried, and then they are laid back on the shelf. I have not had a great deal of experience paraffining for the curing room. Our paraffining is all done for the cheese placed in cold storage. I have now quite a little that is drying and will then go back on the shelf, but they do not remain very long before they are put up into boxes and shipped.

Secy. Baer: I wish to ask Mr. Noyes if he does not think that a new cheese, paraffined or unparaffined, ought to be turned

frequently, especially in the early stages of curing? Is it not a fact that in order to get a uniform or homogeneous curing throughout the whole cheese that we have got to keep this moisture contained in it flowing back and forth, or equally distributed through the cheese? If we are going to dip that cheese in paraffine, to prevent shrinkage, then let it stand on one end for a week or ten days without turning, is it not a fact that the moisture contents of that cheese is going into the bottom of the whole cheese in which case will the curing be uniform throughout that whole cheese?

Mr. Noyes: I do not think, Mr. Baer, it will make so much difference with the paraffined cheese about the moisture, but surely a cheese that is not paraffined should be turned, especially for the first two weeks. A cheese maker that does not turn his cheese every day for the first two weeks is a poor stick. If you follow that man up very long, you will find a great many poor cheese in his factory. I have known of cheese that stood on the shelf so long that you needed a spade to pry them off and you certainly never saw a good cheese cured that way, and you never would see a good rind on that cheese. A cheese that is not paraffined certainly ought to be turned occasionally, and also a paraffined cheese ought to be turned occasionally in the factory and on the shelf to keep it level, and if there is any moisture on the shelf, to relieve it and get the other side to the bottom.

Mr. Mason: I would like to know what sort of device you have for immersing the cheese without cutting it?

Mr. Noyes: We take a galvanized iron rack and we had made a tank that was three feet and a half square and then we had another tank built outside of that, just like a cheese vat above, with a space between. We filled that space with water and let steam into that water and kept the steam turned on all the time, so that the water was boiling all the time and that kept our paraffine hot. In dipping our cheese, we simply took a pair of tongs, shaped them the shape of the cheese, rounding, and large enough so that they would not touch the cheese, and ran a prong out crosswise, just like this (indicating) for the cheese to rest on; that surface where the cheese rested on is one-sixteenth

of an inch, so that it will not cover any space on the cheese; it rested on that, and then we had a little barbed wire run out to keep the cheese in place, and we simply step up there and dip it in and hang it and then put it on a table and another man will take it, then we would dip another. Three of us would take out one hundred and dip them and put them back in one hour. Some of our Chicago men who are large dealers, put six os eight in at a time,—the cheese rests on a little bit of a wire, and they drop them into a large paraffine tank, and there is a back weight on the other end of the lever that will raise these cheeses up as soon as they are dipped, and as soon as they are taken out, another set is put in, and in that way they dip four or six thousand boxes a day. I would say that when we take out the cheeses after dipping them, we run our finger over that little resting place, so that the whole thing is sealed.

A member: I would like to ask if some one has had experience with paraffining brick cheese.

Mr. Noyes: I have not had any experience.

The Chairman: I think we had better drop this for the present and take it up sometime when there are buyers here who can tell us the result. Before entring into any discussion on the next subject, I wish to announce that to-morrow morning Mr. T. B. Millar of Canada will address us and I would like to have you come as sharply on time as possible. Our attendance so far has been greater than it has ever been before at this stage of our convention; this must be pleasing to you and it certainly is to me, and I am very glad to be able to tell Mr. Millar that he can go back to his home in Canada and tell the boys over there that the boys of Wisconsin are progressing, they are not resting at all, they are going ahead, and that they will have to look to their laurels or else we may pass them in a very short time.

BOXING AND SHIPPING.

O. A. Kielsmeier, Hika, Wis.

The subject assigned me by your worthy secretary is "Boxing and Shipping." Now what kind of cheese are we going to box and ship, nothing but good fancy Cheddar cheese that will grade extra in any market of the world? Do *we* know how to make such a cheese? Of course we do, and I don't think that there is one in this audience that would get up and say, "I don't know." Why do we know, or why do I make this statement? Because my worthy colleagues that have gone before me have told or have taught you exactly how to make such a cheese. But very few cheese makers seem to lay any stress on the boxing of cheese, they say, after the cheese is made, no matter how you make it, as long as it is only good, the boxing amounts to but very little. You would naturally think so, if you were to read the bulletins or the reports of this C. M. A. of the last number of years; you don't find it discussed in any of the reports; this of course leads us to believe that this subject must be of very little importance.

In one of the reports you find the subject discussed, "How can Wisconsin produce better cheese?," a very good question. It was answered as follows: 1. Have a good factory, and latest apparatus; 2. good milk; 3. a first class, up-to-date cheese maker; 4. have everything neat and clean in your factory; 5. have a good curing room. These are the five answers that were given. They are of very great importance, but I will ask the secretary to allow me to add one more so as to fill up the half dozen, and that is, Get good boxes and ship your cheese so as to get the highest market price for them, and if possible ½c to 1c premium. I think that the boxing of cheese is as important as the rennet test, hot iron test, racks, forks, etc., and more stress ought to be laid on that subject. It is like this, as soon as you neglect the boxing of cheese somehow you will have a kick coming when you meet your buyer or when your returns come in, accompanyed by a *gift* of ⅛ to ¼ of a cent below the market price.

For example, take a cheese factory were you find an up-to-date cheese maker, good milk, latest apparatus, good curing room, good fancy cheese that will grade extra, and poor boxes; boxing or shipping day arrives, the cheese maker finds his boxes 2 inches to large in circumference, 1 inch to high, etc., the wood being of poor quality. He trims down his boxes, rip down she goes, down below the cheese on one side and on the other pretty good at that, making it a little crooked, but not very much. The next box is of right size, or the cheese seem to fit the box; the next one he trims off and gets it a little crooked, etc., and by the time he gets through he will find that one pile hangs to the east, one to the west, one against the wall, and by the time morning comes the fourth will be on the floor. Now the buyer comes around and enters this curing room. He sees the cheese piled up and their heads hanging to the points of the compass, he will at once make up his mind, that either the cheese are of poor quality or the boxes. He examines and finds the chees all right, but knows himself that it is impossible for him to pay extras, for by the time those cheese reach Chicago, Philadelphia, New York or their point of destination, they will be in the worst condition you ever saw cheese. Covers off, boxes cracked, cheese distributed all over the car, dirty and full of coal dust. We can't blame a buyer for not paying extra for such a cheese. The buyer explains this to the cheese maker, and he will have to acknowledge. Now who is to blame?—not the cheese maker, but the boxes. Of course the cheese maker ought to know better than to get such poor boxes, he will after he has paid for his experience. Every cheese maker ought to know what a good cheese box is, and he ought to instruct his box manufacturer how to make his boxes if they are not satisfactory, for a good box factory will do all they can for you. So, as we know the good cheese are now made, and what we want next is a good cheese box.

In getting a good cheese box get one made of clear ash wood with spruce, bass, or white wood bottom and head, planed as to give a better appearance. The seems should be well riveted, and the bottom and head well nailed, not only three or four nails, so that they will arrive in a good condition at the factory,

but a dozen or two, more or less so that they will be in a good condition when they reach the consumer. The date as to when the cheese were made should be printed in neat figures. If two vats are used number your vats, 1 and 2, and also the shelve or cheese, so that if a batch of cheese seem to go off, you will find it easier to trace back. Now I say neat little figures, don't take a big black or blue lumber pencil, you may find it very handy, but get one of these little printers and you will find it still handier. Now as to the marking of the boxes, put your buyer's or firm's stencil number on it and the date, when the cheese were made, neat and in good order. This marking the cheese and the boxes varies somewhat as to the market you are selling, and the opinion of your buyer. Some want them marked, some don't, you will have to be your own judge.

Never ship a lot of cheese without first testing each day's make, so you know what you are shipping, for every cheese maker should learn to be an expert cheese judge himself. Never divide a poor day's make up among the good cheese, thinking you want to dispose of them in an easy manner, and get full value for them; this will show dishonesty on your part, and your dealer will treat you likewise. Never put a cheese in a box or ship a cheese in a lot where the cap has come off, or a cheese where one end or both are cracked, or cheese that are mouse or rat eaten (such things will happen), unless you make some remark, or tell your buyer about it. Keep such cheese and sell it in your neighborhood, even if you have to sell a few cents below market price. As to weights, the cheese maker ought to give ¼ to ½ of a lb. over and up balance of the scale, for the buyer certainly ought to receive full weight on the day of arrival in the store. I would advise every cheese maker to weigh his curd, Dasies say 20 lbs., Y. A. 10 lbs., Cheddar 65 lbs., Twins 35 lb. This is to be the weight after they are cured and ready for shipment, and have your boxes made accordingly, so that the box will just slip over the cheese, and of equal height, saving you the trouble of trimming down the boxes, a little more work at the beginning but less at the end. Don't be saving as to the using of scaleboards, don't put a half

of one in a box, better put in two on top and bottom, and in boxing Twins put two or three in the middle or between, never one, for the cheese will have a tendency to stick together and when pulled apart by force, will give the surface a very bad raggy appearance. It sometimes happens that you get boxes from the factory where the wood seems to be green, wet and heavy. Never put cheese in such a box, for the cheese will mold much more than they will in a dry box. The weights of the cheese may hold better but the appearance will be worse, for we know the more moisture we have around the cheese in the curing room or box, the more they will mold unless the temperature is very low. Now in shipping or taking cheese from the factory to the station, the cheese maker ought to instruct his patrons to come with clean wagons, the bottom of the wagon box being clean, and free from filth and dirt, thus keeping the boxes from being soiled. Never allow a patron to walk on top of the boxes at the time of loading, not even in dry weather. Always cover up the load with blankets or a canvas so as to protect the cheese from rain, heat and dust in summer, and snow and cold in winter. I think a cheese maker ought to have a few blankets or a canvas of his own so that he need not depend on the patrons to bring one. If you live but but a short distance from the station, say a quarter of a mile or so, it is of minor importance, but where the cheese are to be hauled from 5 to 10 miles as is often the case, this amounts to quite a little and should not be neglected. After the cheese have left the curing room and have reached the station in a good condition, they should be placed in a refrigerator car, no matter how far they are going. Never ship cheese in a common open box car, for they are sure to spoil on you. Always insist on your buyer to examine your cheese on the day of arrival at his station, and if anything is wrong, to let you know immediately, so that you may remedy the cause, and never ship cheese just before a holiday, especially in summer time, say Fourth of July, if shipped a great distance. They are bound to lay over somewhere, and if placed in a poor car will go off flavor and spoil on you. Now, fellow cheese makers, I think I have

touched on some of the important points, that refer to this subject, and if I have left out some I hope you will bring them up in the discussion which is to follow. Make it a lively one, and I furthermore believe, that every cheese maker in this meeting is able now to make, box and ship good first class cheese to every market of the world and receive highest market price for same. And I do hope that when the great world's exposition comes along in 1904 at St. Louis, Mo., next year, that every member of this Association will enter cheese, yes good cheese so that our Badger State will have the greatest number of entries, the highest average score, and the highest score, so that our state cheese instructors may see that their time throughout the state was well spent, and the whole world may know us. And we may then ask the question, Who are we all? (and answer), We are the boys of Hiram Smith Hall.

DISCUSSION.

Mr. Dassow: I would like to ask if it is possiblbe to get such boxes as he advocates, and where can you get them?

Mr. Kielsmeier: What kind do you mean, good or bad?

Mr. Dassow: I used some of these boxes, and I found them worse than the rest of them.

Mr. Kielsmeier: What other kind do you use?

Mr. Dassow: Use those that are made in our neighborhood.

A Member: I would like to ask if he used any different boxes.

Mr. Kielsmeier: Not this last year.

The Member: Was there any difference in the Keel boxes and the other boxes you used before?

Mr. Kielsmeier: Yes, there was.

Mr. Dassow: You prefer the Keel boxes?

Mr. Kielsmeier: Yes, I do. I have not used any other kind for the last year. Four or five years ago I used Mr. Hansen's boxes.

Mr. Alves: They were pretty bad about that time, but they have made some improvements, and of course we all know that

we ought to have good boxes and sometimes they do not seem to be able to help it, if they are a little green or something, but we ought to have them dry when we get them.

Mr. McKinnon: I would like to tell what I saw last summer in connection with this matter of boxing. Down in Chicago I went to a buyer who had bought about one hundred boxes of cheese, and it was necessary for him to go through every box, simply because the outside of the box had not been marked, so as a matter of course when he bought one box, he did not know what the next one would be, but if this cheese had been marked as it should have been, on the outside of the box, some designated mark, showing that such a mark represented such a cheese, then he would have had to go through but seven boxes to know just the nature and character of his goods. The way I do it, I mark just below where we put on the weight of the cheese, with a little small pencil, right on the band of the cheese "1", that represents one day, "2", that represents all the cheese made on the second day; "3", "4", "5", "6" and "7", that represents seven days' cheese, and consequently one buyer will only have to try seven boxes of cheese to determine what the character of those goods are, and that is all he does have to do.

Mr. Kielsmeier: Do you mark your cheese too, or only the boxes?

Mr. McKinnon: Only the boxes, I ship every seven days.

Mr. Dassow: How do you compel the railroads to furnish refrigerator cars?

Mr. Kielsmeier: All the cheese maker can do is to kick, I suppose.

Mr. Johnston: Suppose you have a dishonest cheese maker and he marks those boxes wrong, what about it then? I have seen a case this fall where the cheese was dated on the boxes and I have seen a buyer who showed me one good cheese and one that was not so good, and when the seller called the cheese maker, the cheese maker said it was a mistake, so you have got to go through them all anyway.

Mr. McKinnon: It would not be sensible of any man to undertake to get on the blind side of the cheese buyer, you can-

not do it. There is no blind side to a cheese buyer, he sees through a box in no time. If you take a lot of those boxes up there and he has reason to suspect a little crooked work, you cannot tell which box he is going to try, so there is not any policy in doing that. That would be worse than foolish.

Adjourned till 9 A. M., January 8, 1903.

SECOND DAY'S SESSION.

Thursday Morning, January 8th, 1903, 9 A. M.

Mr. M. McKinnon in the chair.

The Chairman: The meeting will now be in order. The President is unable to be with us at the present time, but no doubt will take his place soon.

THE BABCOCK TEST AND THE CHEESE MAKER.

Prof. F. W. Woll, Madison, Wis.

The Babcock test was given to the public in July 1890 through bulletin No. 24 of the Wisconsin Experiment Station, entitled, "A New Method for the Estimation of Fat in Milk, Especially Adapted to Creameries and Cheese Factories." Within a few months after the publication of the bulletin the test had been adopted by many progressive dairymen and breeders of dairy cattle for determining the quality of the milk produced by individual cows in their herds. Separator creameries before long followed the example set and based their system of payment of the milk received from their various patrons on the amount of fat which the milk was found to contain by the

Babcock test. In due time gathered-cream factories also adopted the test and paid according to the amount of fat which the test showed to be present in the cream. The adoption of the test in cheese factories came last and aside from a few isolated cases, it took considerable education and argument before any number of these left the old pooling system and paid for the amounts of butter fat actually delivered by their different patrons, instead of so and so much per hundred pounds of milk.

The first cheese factory in this state, and for all I know anywhere, to pay by the test was that owned by Henry Walwoord, of Cedar Grove, Sheboygan County, Wis., who began this system of payment in the spring of 1891. An acount of his first season's work was published in Hoard's Dairyman for April 15, 1892, and of his first two seasons' work in the report of the Wisconsin Dairymen's Association for 1893. To-day your Secretary estimates that 70 per cent. of the cheddar cheese factories of the state pay their patrons for the milk they bring according to the test. So far as is known all creameries in the state, whether run on the separator or cream-gathering plan, now use the Babcock test, except such of the latter kinds that are still using the oil test.

It is not so much to be wondered at that cheese factories were rather slow to adopt the test, so long as the composition of milk and the variations to which the milk components are subject, were not fairly well understood. It is very easy to see that the richer the milk is, the more butter it will make. The amount of butter obtained from a certain quantity of milk is all the butter fat contained in the latter, less what is lost in the skim milk and buttermilk, plus the non-fatty components of butter: water, casein and ash. The increase is more than sufficient to offset the losses in the skim milk and buttermilk and there will therefore ordinarily be an overrun in the process of butter making of from 10 to 16 per cent., that is, the weight of butter obtained from a certain mess of milk will be equal to that of butter fat in the milk increased by, say about 15 per cent. on the average. A hundred pounds of 4 per cent. milk will therefore

yield 4 plus four times .15, equal to 4.6 pounds of butter; 100 pounds of 5 per cent. milk will yield 5.8 pounds, etc.

The matter is not quite so transparent in cheese making. Many farmers and old cheese makers believe, or believed, that there is no definite relation between the amount of fat in the milk and the amount of cheese which can be made from it, that there are "butter" cows and "cheese" cows, or they would say that rich milk, that is, milk high in fat, cannot profitably be made into cheese on account of unavoidable losses in the manufacture of such milk. Definite information had to be furnished on these points before the plan of payment on basis of fat content in the cheese factory could be advocated, and only shortly after the Babcock test had been published, investigations in this line were commenced by different experiment stations. As the years have rolled by, reports of these investigations have accumulated, until now the literature on this point is quite large. Geneva (New York) Experiment Station did pioneer work in regard to these problems during the early part of the nineties, and the results there obtained were corroborated or supplemented by those of investigations in Vermont, Iowa, Minnesota, Ontario (Canada), and at our own Experiment Station.

It is not the purpose of this paper to thresh over old straw, as the question of the relation of the quality of milk to the yield of cheese must now be considered, but only to call attention to the fact that the matter for a series of years has received careful consideration at the hands of the best dairy authorities in this country and in Canada and, if I am not greatly mistaken, American dairy scientists are agreed that payment on basis of the fat content of milk is the most equitable method of valuing milk for cheese making, and that patrons of cheese factories should be paid for their milk according to the test, as is now the general practice in creameries.

The use of the Babcock test in cheese factories is not different from its use in creameries, except that cheese factories do not ordinarily use cream separators and there is, therefore, no skim milk to be tested, while, on the other hand, whey is a by-product in cheese factories and its fat content must occasionally

be checked up. In paying for the milk furnished by different patrons, composite sample jars, one for each patron, are provided and into this is put a small quantity of milk from each lot brought by the patron; the sample is preferably taken by means of a "milk thief" or a Scovell sampling tube, so that each lot of milk delivered will contribute a proportionate part to the composite sample. At the end of the testing period, which may be for a week, or ten or fourteen days, according to mutual agreement, the samples are tested, and the total quantity of milk delivered during the testing period multiplied by the test of the composite sample will give the total number of pounds of fat delivered by each patron. The milk is then paid for according to the net value of a pound of butter fat, the net value being obtained by dividing the gross earnings less the expense of manufacture of the cheese, by the total number of pounds of fat received at the factory during the testing period.

The testers used in the early days of the Babcock test were wooden or tin hand machines, of cheap and poor construction. They have now been entirely superceded by substantially built, easy-running cast-iron machines, like the Facile, Agos and the Twentieth Century testers, and in factories steam turbine testers have been generally introduced. The latter have the advantage over hand testers in point of convenience and durability; it takes less muscle to run them and they require less personal attention. It is important, however, that the turbine testers be kept well oiled and sufficient steam must be on to run them at the required speed. The fact that the bottles can be kept hot until they are read off is a great advantage; the manufacturers of some machines rather overdid this matter up to a couple of years ago, when it was found that tests made in these testers came from .1 to .3 of one per cent. too high, owing to the expansion of the column of butter fat at the high temperature at which the bottles were kept in the tester. I first called attention to this point at the convention of the Wisconsin Dairymen's Association in Feb., 1900, and turbine testers manufactured of late are not subject to this error; the cover of the tester is now generally provided with holes that can be opened and

shut at will, and the upper compartment of the tester is only moderately heated by the steam that drives the revolving wheel of the tester. The temperature at which the tests should be read off has a wide range, viz. 150–120 deg. F. If the temperature goes above 150 deg. the readings will be too high on account of the expansion of the fat, and if it is lower than 120 deg. the column of fat will begin to solidify so that no sharp readings can be taken.

Composite samples should be kept until the result of the test has been compared with earlier tests. In case of apparently abnormal results, the bottles can then be warmed up and read over again, so that it may not be necessary to repeat the test. The tests of milk from the same patrons will vary greatly from week to week at best and the operator should not report a test that looks suspicious until he has satisfied himself as to the correctness of the test by a second reading, or better still, by a retest of the composite sample.

The testing of the whey does not offer any special difficulties. Whey contains only six to seven per cent. solids, of which .2–.3 per cent. is fat and the rest largely milk sugar. The sulphuric acid therefore readily dissolves the non-fatty solids and the fat is forced into the neck of the test bottles on whirling these. A small column of fat is generally formed, extending clear across the surface of the liquid in the neck of the bottles; if there is not enough fat in the whey to do this, it is necessary to use a double-neck skim milk bottle for making the test. As is the case in testing skim milk the readings with these bottles should be increased by .05 of 1 per cent. to correct for the small amount of fat which will always remain suspended in the acid—whey mixture, owing to the minuteness of the fat globules. When tests are made in ordinary Babcock test bottles a similar amount of fat remains in the bulb of the bottles, but a liberal reading is always taken in using these bottles, viz. from the bottom of the column of the fat to the top of the upper meniscus, not to the middle or the bottom of the upper meniscus. Tests of whey, as well as skim milk, are preferably made in hot testers so as to facilitate the separation of the fat. In case of these by-products

a hot test is no disadvantage as the amount of fat separated out is so small that its expansion at a high temperature has no apparent effect on the reading of the tests.

As is well known, cheese can also be tested for its fat content by the Babcock test; it is necessary to procure a small sensitive scale, a so-called cream scale for this purpose, and also some cream bottles, so that a good-sized sample may be weighed out. I shall not here take up time by giving details of the method of procedure in testing cheese, as it can be readily found out from "Testing Milk and Its Products."

It is as important to the cheese maker as to the creamery man to have the confidence and good will of the different patrons and a correct system of testing of the milk will go far towards securing for him this attitude on part of the patrons. A good plan to adopt is to encourage patrons to be present when the testing is done and to freely discuss the results with them. If the accuracy of a test is drawn into doubt, make it over again in duplicate and do not accept the results until both your patron and you are satisfied as to the correctness of the test. Mistakes will happen to the most careful ones;—even Jupiter nods. Errors may come in sampling as well as in testing. It is no disgrace to make an error, but when it does happen we owe it to ourselves and to our bubsiness enterprise to see to it that it is rectified.

The main source of error in *sampling* comes from insufficient mixing of the composite sample or careless handling of this during the testing period. In the former case the cream formed on the sample is not thoroughly incorporated in the milk through careful pouring from one jar into another, and the sample drawn will not contain the right proportion of cream to milk. In the latter case, the composite samples have been handled roughly as new portions of milk are added, so that by the end of the testing period fine butter granules will on close inspection be found floating in the sample, or the inside of the jar will be covered with patches of dried up cream which cannot again be incorporated in the sample, except with great difficulty. A too low test is the inevitable result of these conditions.

Every time a new portion of milk is added to the composite sample jar, this should be given a gentle horizontal rotary motion, so that the cream formed on the milk may again be evenly mixed with it and will not stick to the sides of the jar. The condition in which the composite samples are kept speak eloquently of the care which the maker gives to his work. Unless proper care is taken in handling and sampling the composite samples, satisfactory tests cannot be obtained; nor can justice be done to the different patrons.

Errors in *testing* may come from two sources: first, the strength of the acid, or the temperature of the milk or acid is not right, and second, the tester is not run at a sufficiently high speed. The action of acid of different strength on milk is well known to persons who have had some experience with the Babcock test. The proper strength of the sulphuric acid to be used in the Babcock test is 90–92 per cent. Fortunately the commercial acid which is manufactured on an immense scale in this country and abroad, and used for numerous industrial purposes, has this strength as it comes to us in carboys or is bought at drug stores. Acid of this strength has a specific gravity ranging between 1.82–1.83. If the specific gravity falls but slightly below 1.82, it is still possible to obtain a satisfactory test with it by using a cubic centimeter or two more than the usual quality of acid, or by warming the milk to be tested to about 100 deg. F. Acid which is too weak, of a specific gravity below 1.82, will not give clear readings, there being always formed more or less of light curdy or brownish matter either in the column of fat or directly below it, where such acid is used. By warming the test bottles containing the samples of milk, preferably by placing them in some lukewarm water for a few minutes, the action of the acid is intensified and the casein of the milk all dissolved in the sulphuric acid; result, a clear test.

If the test comes out cloudy so that it is difficult or impossible to get an accurate reading, the best plan to follow is to let the bottles cool until the fat solidifies and then heat again; the curdy flocculent deposit will then generally be separated out and a sharp reading obtained. Acid from a recently opened

carboy which is all right at first, may later on become rather weak owing to absorption of moisture from the air. Satisfactory tests can then only be made by using a somewhat larger quantity than prescribed, or by warming the milk samples slightly prior to adding the acid. When anything is the matter with the acid in the factory the trouble is generally that it is too weak. Too strong acid is rarely met with; if a new lot is found rather strong, the difficulty may be easily remedied by using a couple of c. c. less than the normal quantity, and after a while it will absorb enough moisture from the air so as to be of normal strength and make satisfactory tests when the ordinary amount is added. It is much the safer way to weaken a rather strong acid by leaving the bottle uncorked for a time, than by pouring the acid into a little water; water should *never* be poured into concentrated sulphuric acid, owing to the danger of explosions that may result.

I mentioned before, that the results obtained by the Babcock test may come too low because the tester was not run at a sufficiently high speed. This is of so much the more importance as the results of such tests to all appearances are all right, and the only way to ascertain whether or not the readings are correct is by making another test and running the tester at a higher speed. Unless the operator keeps the tester well oiled and sees to it that there is enough steam on to run it at the required speed, all efforts in other directions to secure a correct test will be in vain. After he has used a tester for a time and becomes familiar with the particular hum it makes when run at the right speed, he will readily discover when it does not run fast enough, by the noise it makes, and will consult the speed indicator which all good turbine testers now on the market are supplied with.

It may seem unnecessary to say that all tests must be read correctly, just as they come, without shading or "doctoring." There is, however, considerable evidence, and still more suspicion, abroad in the land that correct tests are not always given in some factories. Any practice of doctoring tests will be sure to bring its punishment on the guilty party. Competition between different factories in some cases has been responsible for

changing the reading in upward direction, while a lack of competition has in other cases tempted the operator to read tests low. Both practices are, of course, equally reprehensible, and if persisted in, will be ruinous to the good name of the operator and his enterprise. A correct test is a fundamental requirement in paying for the milk delivered by different patrons on basis of the quantities of butter fat contained therein. As Babcock tests become more generally used on dairy farms, as dairy farmers become better educated, and especially better informed as to the quality of the milk produced by their cows, it will be more difficult for the factory operator to sway from the path of righteousness by not giving a patron full credit for the fat content of the milk he delivers, or by giving some more than the credit due them at the expense of other patrons.

A well-informed, intelligent cheese maker may easily render the patrons of the factory, and thereby the whole community in which he resides, invaluable service by assisting them in agricultural and dairy matters, by acquainting himself with the conditions under which the farmers are working and giving such advice as he may be able to offer, as to the conduct of the dairy in the various phases, of the production of the milk, as to system of feeding the cows, necessity of care in milking them, caring for the milk prior to delivery at the factory, testing the milk from individual cows in the herd, etc. If he is not able to give advice he may be able to refer the patron to somebody who can do so. The various experiment stations and different divisions of the U. S. Department of Agriculture every year send out a large number of publications on dairy topics that are of the greatest value to milk producers. By being on the lookout for such publications and applying in time to the director of the experiment station or the Secretary of Agriculture at Washington he may often secure enough copies of these to supply each of his patrons with the bulletin. A couple of months ago a bulletin was, for instance, published by our experiment station showing the importance of thorough milking and the losses that may be sustained on the farm by not sufficiently careful attention to the work of milking. If the teach-

ings of the bublletin were heeded it would be worth several million dollars every year to the farmers of our state alone. Quite a number of creamery and cheese factory operators have been supplied with copies of this bulletin for their patrons, upon request, and we will gladly send other operators copies for distribution among their patrons, so long as the supply on hand lasts.

The factory operator can well afford to test, free of charge or at cost price, samples of milk from individual cows of the patrons, provided he instructs them properly as to how to take samples of single or several milkings. There is abundant testimony on record showing that an improvement of the herd will result from the testing of the milk produced by single cows therein. It is out of the question for most of the small general farmers, or even most of dairy farmers, to do their own testing. They do not know how, for one thing, and even if they did, the expense of buying even a small tester, the handling of corrosive acid, or the time it takes to make tests, would debar most of the farmers who keep only a small number of cows, say less than a dozen, from finding out anything about the quality of the milk produced by their single cows, unless they can get the testing done at the factory at a normal charge or free of charge. Most of the farmers of this class do not see the need of making tests of the milk from single cows and it is, therefore, necessary for some one to show them the importance of the work, to demonstrate to them, as can be done with but little trouble by weighing and testing the milk, that some of their cows are not worth keeping, as their production of milk and butter fat does not pay for the food they consume, while others will give ample returns for extra feed and attention. The factory operator, if he has studied his business and keeps well informed, can more easily assist in this work of agricultural and dairy education than anyone else, as he stands close to the farmers and has daily opportunities to talk over matters of mutual interest with them. Both he and the patrons are interested to an equal extent in improving on present conditions. By getting more butter and milk from the cows the product of the factory will be increased. More milk means more money to the farmer and more business

to the factory; therefore, higher wages to the operator. But over and above this consideration comes the satisfaction which the operator will have, of having done what he could to make himself useful to the patrons of his factory and thus contributed to advancing the interests of the community where his lot is cast.

DISCUSSION.

A Member: I would like to ask whether Prof. Woll considers that the yield is proportionate to the fat?

Prof. Woll: As I said in the paper, the payment by test is, according to the testimony of American dairyists generally, the most equitable method of settling with the patrons. You ask if the yield was proportionate? I am constrained to say that it probably is not quite proportionate with very rich milk, but in ordinary factory practice the range in the fat contents of the milk will not be much over one per cent., say between 3.1 or 3.2 to 4.2, it will be about one per cent., and in those limits the yield is just about in proportion to the per cent. of fat which the milk contains.

Mr. Michels: I would like to ask the Professor what he thinks about the plan I have heard discussed last summer, where they want to add 2 per cent. for instance, to all fat, and then divide that on the whole?

Prof. Woll: That method of payment was suggested seven years ago by Prof. Dean of Canada. So far as I am aware, the method has not received the endorsement of Prof. Robertson, of Canada, or any of the dairy scientists who have studied the matter. I am not aware that the method has increased any in late years. However, Prof. Dean will be here this afternoon and tomorrow, and I think it is only just to him to let him explain that method himself. Personally, I do not believe it does justice to the different patrons, as is done by paying by the test of strength, and this is the opinion that is held by Dr. Babcock, for instance, as you will see by the Poster Bulletin I handed you, and Dr. Van Slyke, of New York, and other Amer-

ican Experiment Station people who have studied this question.

Mr. Michels: It seems to me it is even more than that, it is giving a premium on poor milk for the man who delivers it. I have one factory in particular where the patrons have been talking about it, and I am glad to get this opportunity of talking over these points, so that I can speak to them with some authority.

Prof. Woll: That is the situation at present, as far as I am aware, that method is used to a very limited extent. Mr. Millar of Canada told me this morning that only 5 per cent. of the Canadian factories use the method, and it has not, as I said, been adopted by more factories of late years than it was shortly after it was published, so it seems to me that that speaks eloqently as to the practice of the system, it is not as just a system as paying for it on the fatty strength, in my opinion.

Mr. Aderhold: On this question of adding to the actual per cent. of fat, I saw an article in one of the dairy papers by Mr. Monrad, who took up that question, and he figured out, I do not remember the figures, but he showed plainly that if there was anything added to the test, a man by watering his milk would get paid for part of the water that he put in. That is one thing that we ought to consider in this connection.

Mr. Michels: In other words, the operator is offering a premium for poor milk, the patron will get pay for the watered milk, whereas by the straight test they do not get anything for the water that might be in it.

Mr. Anderson: As I understand the situation at present, it is not many that claim a proportion on the yield to the butter fat in milk in cheese making. It was said that we lose in proportion of that yield from rich milk. But now comes the trouble, we do not get any more for this cheese that is made from 4 per cent. milk than we get for cheese made from 3 per cent. milk, and in fact there may be as good cheese made from 3 per cent. milk as from 4 per cent. milk.

(Cries of No, no, no, no.)

Mr. Anderson: Well, now, I know anyway there has been cheese sent to the Wisconsin State Fair made from 3 per cent.

milk which scored 97, and I call that good cheese. Now to pay straight by the test in cheese making, that means like this, one patron may get a dollar per hundred for his milk, another gets 75 cents for his, and there is no such difference in the yield. I know that by my own experience and by the reports on milk at the dairy schools; these reports are usually good text books. There is the report of about 350 dairy students; the yield of cheese through the whole season, according to the tests, of one pound of butter fat in 3 per cent. milk was 2.95 lbs. of cheese; and in 4 per cent. milk 2.50, and the average yield for the season was 2.63 pounds of cheese to one pound of fat. That shows plainly that we did not get yield in proportion to the butter fat in the milk. That is what I meant, but that will be all right if we would get extra pay for the cheese made at the extra expense, but if we do not do that, I think the right way is to use the Babcock test, that is all right, but use that as a basis to figure out the yield. It is just as fair to pay the yield in cheese making as it is to pay by the yield in the creamery. Now I think it is impossible to get yield in proportion, because I think there is just as much caseine in 3 per cent. milk as there is in 5 per cent. milk.

Prof. Woll: There is some rich milk that has 5 per cent. fat.

Mr. Anderson: Now I saw some figures given by a doctor in New York state; he said his figures represented results from 140,000 analyses of milk, and he gave the per cent. of solids and water in the milk from different regions, he gave the average per cent. of Jersey milk to be 5.21, in Holstein he gave the average per cent. of fat 2.88, and those extremes contained exactly the same amount of protein; he did not give the caseine separate.

Prof. Woll: I believe the gentleman is mistaken in regard to the interpretation of Prof. Jordan's figures. It is certainly a fact that the richer milks have a higher per cent. of solid not fat and a higher per cent. of caseine. I have here a compilation of about all the analyses of milk from pure bred stock that I could lay my hands on. This was published in the last annual report from our experiment station, and the average of

nearly 500 samples of Jersey milk gave the fat at 4.98, the solids not fat at 9.55; now take the Holstein,—679 samples gave 3.28 fat, and 8.61 solids not fat. I need not give you any other figures on this. It shows that the milk high in fat has a high per cent. of solids not fat, and that is certainly the result of our analytical work along that line. There is one point that we want to bear in mind in discussing the question of yield of milk of different richness, and that is this, that the experiments that have been made, as shown by the poster bulletin and card I have handed out, I made my skim milk one per cent. milk, then 3, 4, 5, and 6 per cent. milk and the yields from those. Now that is the theoretical question. The practical question is this, Does the herd milk as it comes to the factory vary, and how much does that vary, and what are the yields of cheese from milk of that character, and as I said before, the variations between milk delivered at different factories by different patrons rarely exceed one per cent., so that the question comes, does the yield increase in the same ratio within that limit, and I then on that proposition maintain, as I said before, that the yield is very nearly up to the proportion shown by the fat.

Mr. Aderhold: I have a little bone to pick with the gentleman; he referred to something that came from Prof. Decker, I believe, as to the yield of cheese from rich milk and poor milk, 2.95 from 3 per cent. milk, and 2.50 from 4 per cent. milk. Those are the figures he gives in his book on "Cheddar Cheese Making." Now, I have noticed those figures and the way Prof. Decker got at that was, he took it from the reports that the students had been sending in, and it covered probably many thousand reports from the different factories, and it furnished the basis of material for demonstrating what the yield of cheese is per pound of fat in factories, but I considered that Prof. Decker's construction was fallacious or unpractical, because the poorer milk, the 3 per cent. milk, was a little better than 3 per cent.; we get it in the spring of the year only, our factories shut down in the winter, the cows are all fresh in the spring, and that is the time when we make what we call the "hurry-up" cheese. We are not working that milk normally as we do in the summer.

We are not trying to make a cheese that has got the body to it that a good cheese ought to have. We are making a cheese that has got an abnormal yield, an illegitimate yield, and that is why he gets those figures, that is why the yield shows up to the better with poor milk than it would show up if we tried to make as good cheese as we make later on, and for that reason that construction was not practical. I just wanted to explain this, that that is an illegitimate yield; then again, when we have the richest milk, which is in the fall of the year, milk will run in Sheboygan County 4 per cent. fat. The fat will average up in Manitowoc and counties around there, as high as 4.5 and 4.6; farther north in the newer county it will be higher than that. Now, there again, the construction is unpractical; that is the time when we hold milk over, we makeit up every other day, sometimes twice a week only. Now, you all know that old milk will not yield quite as good as it would if it were made up every day. The construction all through on those tests is unpractical and really needs explaining.

Prof. Short: They say that nothing will lie like statistics, and when a man has figures he always tries to show something by them. Now, Mr. Anderson is right in some respects and Mr. Aderhold is right in other respects. But the point comes in there, when you say how many pounds of cheese you are going to get from a certain per cent. of milk, you are introducing a decided fallacy. You carry that out to a legitimate conclusion, to say that a 4 per cent. milk will yield ten pounds of cheese per hundred, you begin to run your fat down, and you get a skim milk cheese, and the minute you do that and you find out that your relation of fat to cheese is high and for every per cent. you add to that you increase wonderfully the amount of cheese and you decrease the fat, you add wonderfully to the amount of cheese per pound of fat. If you run up the other way, you run it up richer still until you get to a point where you simply have no cheese at all, no yield at all to the amount of butter fat, therefore you cannot always say that a pound of butter fat will give so much cheese. I think you go to extremes, and the same fact is apparent from the figures quoted, your fat

increases a great deal more rapidly than your caseine, and the relation of percentages between the two cannot be established.

Mr. Luchsinger: The Professor's paper seems to demonstrate to a practical man two things, that if we have the conditions, the temperature proper, the acid is strong enough and the motion of the test is just right, the Babcock test is a reliable test for testing the amount of butter fat in the milk, but if those conditions are not just right, it is a very unreliable test, and that accounts for the great number of complaints that are made in cheese factories by patrons who cannot understand that at one time their milk will test so much and perhaps in two or three days or a week afterwards, it does not test near that much, so I think the practical application of the Professor's paper is this, that every one using a test of that kind should see to it that the conditions are just right. If the temperature is too high, as the Professor's paper says, the readings are higher, the butter fat expands, just as almost any other substance expands, by the heat, and the factoryman or the creameryman is deprived, is wronged, he has to pay for more butter fat than there actually is. If it is too cold, then the patron is wronged, unintentionally. It has demonstrated those things to my satisfaction. Now, as to the question of paying at the cheese factory according to the test, I am inclined to doubt whether it is the proper way, according to the butter fat test. There have been instances in which prosecutions were brought for watering milk brought to cheese factories, and the Babcock test showed that there were 3 per cent. and perhaps a little more of butter fat, and the person who brought the milk escaped punishment. Now, if the milk originally tested 5 per cent., and the man put enough water in to bring the test down to 3 per cent., he would comply with the present law, and yet the cheese maker would be defrauded, he would not get the amount of solids other than fats that he should have in the milk and therefore I think that in addition to the Babcock test, the lactometer is a necessary instrument to have in a cheese factory, and a knowledge to use it in any way you can to demonstate and prove the amount of solids contained in your milk other than fats. That question

to test milk by the Babcock test alone in the cheese factory is unfair, is not the proper test, is not a correct test, and the factoryman is very liable to be defrauded in the way that I have indicated. Where a man's cows test high, he can water his milk and still escape punishment and detection.

Mr. Noyes: I have in mind at present a test made by Dr. Van Slyke of fifty different herds of cattle. I studied that thing a little, so that I remember it, and the range of fat was from 3 per cent. to 4½ per cent., and in those tests he found that when butter fat went up one fourth per cent., the caseine went up one tenth per cent. right straight. Now, it seems to me that is a pretty good demonstration, and they were a mixed herd of stock, such as we have at our factories, there were not any full-blooded herds in that test if I remember, and while we have got to have some proper, correct method in the factories, a man has got to weigh his fat just as well as to run the Babcock test right, in order to have it right, and I think the Babcock test is the nearest right, while it is not absolutely correct, I think it is the nearest test we have had yet. I will say this further, we have not one factory in our section, but what tests by the Babcock test. I had the pleasure of looking over the figures of those factories for six months, and we foun the man who paid off by the test on an average paid his patrons fifteen cents a hundred more than he had done paying per pound of milk. Now, that demonstrates that there was something wrong in that factory, the patron did not get as much as he should have, and it is the general thing, wherever the tests have been put in, we get better yield right along, we have in all of our factories, than we did before. While it is not just exactly right, I think it is the nearest right of anything we have ever had.

Mr. Michels: I would like to ask Mr. Luchsinger where he thinks the patron is going to gain by adding water to milk, because it will decrease the solid not fat as well as the the fat. I do not see his point, he only gets more weight, that is all I can see.

Mr. Luchsinger: This was the case where the milk was

bought by the weight. If the patrons sell the milk by weight, they get paid for so much more water.

Mr. Michels: Yes, but the test will be so much lower on the solid not fat.

Mr. Luchsinger: If he comes within the law, if he can keep his milk at 3 per cent., a trifle over, he escapes punishment, and he gets paid for so much water, and the cheese maker does not get as much cheese out of the milk as he should.

Mr. Michels: That is a good argument for paying by the test, is it not?

Mr. Luchsinger: A good argument for paying by the test, and most of the cheese factories do not pay by the test; creameries do, but cheese factories pay by the pound.

Mr. Michels: I would like to ask Professor Woll what the tests on cheese are for butter fat between, sa, 3.2 and 4 per cent., or, say, 3½ or 4 per cent. What are the differences in the contents of the cheese as to fat?

Prof. Woll: I do not know that I can give you definite figures about that. Full cream cheese will contain considerably more fat than cheese made from milk that has been partially skimmed, but I have not now the figures in my mind. There is quite a rapid decrease in the per cent. of cheese made from milk with decreasing fat contents and corresponding to the decrease in the fat contents from increasing the water contents.

Mr. Michels: The question comes up right there that they can sell cheese that is made from milk containing 3½ per cent. of fat, and it will bring as much upon the market as 4 or 4½ per cent. of fat. That is the question I am trying to get at, and it seems to me that there could never be much difference in the amount of 100 pounds of cheese made from such fat.

Prof. Woll: There is quite a difference, the yield is in proportion to the fat contents.

Mr. Michels: Mr. Anderson brought out the question that he could sell his 3 per cent. cheese for as much money as his 4 per cent. cheese. I think the gentleman may be all right, and if it is true what you told us, that the cheese yield was nearly

in proportion to the amount of butter fat in it, why, then the 3 per cent. cheese would have nearly as much fat in it as the 4 per cent. would, and it ought to test as about as good a cheese.

Mr. Aderhold: I would like to ask Mr. Anderson about that. Was that cheese exhibited at the State Fair made from 3 per cent. milk?

Mr. Anderson: It came from two factories that generally have 3 per cent. milk. It was made in the summer.

Mr. Aderhold: Probably July or August. I do not believe they would get a 3 per cent. milk in July or August. I know something about how milk runs in the factory.

Mr. Noyes: I know that cheese made from different per cent. milks sell exactly the same, and I will say now, we ought to work together with the cheese buyers on this question. The cheese buyers ought to tell their opinion in regard to the quality that the cheese ought to have. If they can pay more for rich cheese, it is all right, but if they cannot, then I would say it is an injustice to the low test man to pay straight by the test. Of course if we can get higher prices, it is all right. But I do not think the buyer can do it, because the making of the cheese costs more than can be made up for by the higher test.

Mr. Arnold: I want to ask Prof. Woll a question on the strength of acid, I want to know whether the acid is always satisfactory for testing, that is, as regards strength, if the specific gravity is right and the acid is clean otherwise.

Prof. Woll: I should say yes; I have had no occasion to doubt that that is so. We have always had good tests with acids that had the correct specific gravity. I may say in regard to the matter that was brought up by Mr. Luchsinger in regard to 5 per cent. milk and reducing it to 3 per cent. milk. A patron that would do that would be within the law as the fat itself is concerned. The law specifies that the milk shall be delivered to the factory as produced by the cow, and if the cow produces 5 per cent. milk, he has to bring it to the factory as 5 per cent. milk, and he cannot add water to reduce it to 3 per cent. The law covers that point perfectly, and the Dairy and Food Commission in their work of testing milk at factories al-

ways take into consideration the yeld from the cow as well as the per cent. of fat in the milk, and there will be no difficulty in establishing the adulteration of 5 per cent. milk in bringing it down to 3 per cent. by the addition of water.

Mr. Luchsinger: The Professor is perfectly right, the law provides that milk be brought unadulterated and undiluted to the factory; a man is liable to punishment if he is detected. Now, the point is, how shall we detect it? You cannot do it with the Babcock test alone, in my opinion, you must have a lactometer also to detect the amount of solids other than fats, and I think the point I tried to make was that the Babcock test alone is not sufficient in a cheese factory where the milk is bought by the weight and not by the test.

Mr. McKinnon: One difficulty in paying by the test up in our section of the country is that a large per cent. of our cheese makers are not qualified to manipulate the test. It requires some skill, it requires good eyes and good judgment to manipulate that Babcock test and get it to work thoroughly. Now, we have been discussing up in our section of the country the advisability of having some persons appointed, elected or chosen in some manner that are qualified to make the Babcock test and go around as these cheese instructors are going around from factory to factory to make those tests. Perhaps we could get better satisfaction in that way. In paying straight by the test, we have not been able to reach the results that it appears you have reached in other parts of the state. A few years ago I undertook to pay straight by the Babcock test, and I ran that way for two years, but it was quite unsatisfactory, and, in fact, I was losing my patronage, consequently, when I heard about this idea of adding two per cent. to the milk and testing in that way, I concluded that I would adopt that system, and I adopted that some three years ago and it has given entire satisfaction.

Mr. Michels: I would say to Mr. McKinnon that I have been paying by the straight Babcock test for the last eleven years, and it has given entire satisfaction.

Mr. Noyes: I put in the test and ran it for a few years, and it will be impossible to pay in any other way now.

Mr. Michels: I think if Mr. McKinnon had kept on one year longer, it would have been all right.

Mr. McKinnon: I would not have had anything to test.

Mr. hort: What class of patrons did your complaints come from, those that brought the high class milk, or the low?

Mr. McKinnon: When one man is receiving a dollar a hundred for his milk, and his next neighbor is only receiving seventy-five cents, as a matter of course the man that is receiving seventy-five cents is the one that makes the complaint.

Mr. Noyes: Is it right for that seventy-five-cent man to take part of the other fellow's money?

Mr. McKinnon: No, but it is right that that man should receive pay for every ounce of cheese that his 3 per cent. milk makes. It is also right that that man should receive every cent that is due him out of four per cent. milk, but he should not receive any more. Now, we are all aware of the fact that there is no such difference as twenty-five cents on a hundred pounds of milk made up into the average cheese at the present time.

Mr. Noyes: I beg to differ. Take those figures right there, that is cheese made from patrons' milk; take the price of cheese and the yield and it will make more than that, it will make thirty-five cents per hundred, right in the manufacture of patrons' milk just as they deliver it to the factory and made into cheese. How do you account for that?

Mr. McKinnon: We do not find in our section of the country that as milk increases in richness the cheese increases in yield. I am not very well posted on these different figures, I think I am posted on general results, and the 3 per cent. milk will give you perhaps nine pounds of cheese out of one hundred pounds of milk. If it ran on until you get four per cent. milk you get about ten pounds of cheese out of one hundred pounds of milk. That is about the way they run, and there is no such difference as twenty-five cents per hundred pounds. Do you claim, Mr. Noyes, that you are going to get two pounds out of the difference between 2 per cent. and 4 per cent. milk?

Mr. Noyes: Well, 2 per cent., yes.

Mr. McKinnon: You do not know whether you do or not.

We do not so find it. There may be difference in localities, but we do not find that the yield varies so much on that as they do in other parts of the state, and while we are perfectly willing that you in that section of the state should adopt this Babcock test and pay straight by the test, we in our section of the country must consult our own interests and pay by the Babcock test, with 2 per cent. added, or we will pay on some other plan that we deem to be strictly in accordance with justice with us.

The Chairman: Yesterday it was with pleasure that we sent a fraternal greeting to our brethren in Ottawa, Canada, who are holding their annual convention, and this is their reply:

Ottawa, Ont., January 7, 1903.

W. C. Dickson, Esq., Prest. Wis. Cheese Makers Ass'n., Milwaukee.

Eastern Ontario Dairymen in Annual Convention assembled at Ottawa, desire to reciprocate your kind greetings and best wishes for a successful and instructive meeting.

D. Derbyshire, Prest.

The President then introduced to the convention Mr. A. J. Decker of Fond du Lac, who extended a cordial invitation to all the members to attend the annual meeting of the State Dairymen's Association, to be held at Fond du Lac February 11–13, 1903.

Secretary Baer: Mr. President, I have a letter of greeting from Congressman S. A. Cook of Neenah, Wis., who is at present at Alexandria, Ind., on business, also a telegram from Mr. D. W. Willson, editor of the Elgin Dairy Report, Elgin, Ill. They read as follows:

Alexandria, Ind., Jan. 8, 1903.

Mr. U. S. Baer, Secretary Cheese Makers' Association, Milwaukee, Wis.

My Dear Sir: I wish that I could have the pleasure of dropping in at your annual gathering this week in Milwaukee, where much information can be obtained and much good accomplished for the cause for which the Association labors. Busi-

ness interests here prevent me from getting back to Wisconsin in time or I should certainly be present.

Enclosed find membership dues, with greetings for the New Year and best wishes that success may attend your every effort.

Very sincerely yours,

S. A. Cook.

Elgin, Ill., Jan. 8, 1903.

Mr. U. S. Baer, Secretary Cheese Makers' Association.

Express to meeting sincere regrets that I am unable to meet cheese makers. Hope that every one will secure a premium in increased interest in their profession.

D. W. Willson.

CHEESE MAKING.

T. B. Millar, London, Ont., Canada.

Mr. President, Ladies and Gentlemen: I would assure you that it gives me a very great deal of pleasure to meet the cheese makers of Wisconsin. I have to thank your worthy secretary, Mr. Baer, for a very kind invitation to be present and I was very glad indeed to accept the invitation, and I have noted with interest the vast strides you have been making during the past few years in the making of fine cheese. We thought at one time that Canada had this particular business almost to herself, and we began to become interested in your work, and while I am here to try to give you some information as to what we are doing over there, I am also here to get all the information that I can from you. I notice your discussions are very lively, and take up a great deal of time, and so I purposely made my paper short. I endeavored to bring out what I considered the important points and then in the discussion I hope to be able to give you some more information than if I devoted a longer time to my paper.

In order to make fine cheese it is necessary to have pure, sweet, clean milk. In selecting the milk great care should be

exercised at all times and all gassy or tainted milk should be rejected.

After the milk has been received heat slowly to 86°, keeping the milk stirred gently all the time that the heat is going on the vat. As soon as the temperature has been raised to 86° make a rennet test at once to determine the condition of the milk. If you find that the acid is developing very slowly a small percentage of good flavored starter may be used to advantage but during the summer months, as a rule, a starter is not necessary. If colored cheese is desired add the color as soon as the weight of the milk in the vat is ascertained. Set the milk so that the curd will remain in the vat from 2¾ to 3¼ hours from the time the rennet is added until the curd is ready to dip. I would rather have it over 3 hours than under 2¾ hours. If finest cheese are to be made the curd must be *thoroughly* cooked. Use enough rennet to coagneate the milk fit for cutting in about 30 minutes. When the curd will break clean over the finger commence cutting using the horizontal knife first, cutting slowly lengthwise of the vat; then, with a perpendicular knife cutting crosswise and then lengthwise which is usually sufficient, but if the knives are coarse or the milk working fast an extra cut will be beneficial. Stir the curd carefully for 10 or 15 minutes before turning on any steam; rough handling at this stage causes a loss in weight and a rough feeling and slow-working curd. Heat slowly at first, raising the temperature to 80° in about 1½ hours from the time of setting. When the curd shows any acid run off part of the whey and stir the curd well. Dip with ⅛ to ¼ inch of acid by the hot iron test and always endeavor to have the curd in such condition at dipping that it will not require much stirring to express the moisture and remember that it is not necessary to retain whey in the curd to get *meaty good flavored* cheese. After the curd has been stirred sufficiently dry leave it about 6 or 8 inches deep and allow to mat. When it is well matted cut in strips about 6 or 8 inches wide and turn upside down, turn again in 15 minutes and pile two deep and keep turning often enough to keep the whey from gath-

cring on the curd. When the curd becomes flakey and will show 1¼ inches acid by the hot iron test it is ready for milling. This should take place in about 1¾ to 2 hours after the curd is dipped. Stir the curd constantly for 10 minutes after milling and then frequently until ready for salting. After a curd is milled it should never be allowed to mat as this means a loss and if the curd is lumpy at salting the salt will not be distributed evenly and open cheese will be the result. When the curd becomes smooth and feels like velvet it is ready for salting. This usually requires about 2 hours after milling, but do not be in too great a hurry to salt the curd. Often 15 or 20 minutes extra stirring will make a wonderful difference in the curd and the quality of the cheese. When ready for salting spread the curd out evenly and see that it is free from lumps. The quantity of salt used will have to be governed by the time the cheese are to be held and the market that they are intended for.

DISCUSSION.

Mr. Luchsinger: You say that you stir the milk, keep stirring as fast as it is accumulated in the vat. You have a constant stirring of that milk?

Mr. Millar: Yes, a good many of our factories use the agitators and they are kept going around continually in the vats, and we find that we get better results than by allowing the milk to stand while the steam is going on, you naturally suppose that if the milk is standing in one position that when steam or hot water is striking upon it that it is very apt to get too much heat.

Mr. Luchsinger: You heat about how fast?

Mr. Millar: We have no particular time for heating milk, but we prefer heating it slowly.

Mr. Aderhold: Do you make any endeavors to keep the curd warm after milling, or are you satisfied to have it begin cooling at once?

Mr. Millar: In a good many of our factories the curd sinks are used, in fact, I might say in ninety-nine per cent. of the factories west of Toronto, curd sinks are used for the curd after dipping, and in the cold portion of the year we use hot water under the racks, but in the summer months we do not use any contrivance at all to keep up the heat, in fact, we find the curds keep quite warm enough without any.

Mr. Aderhold: I mean after milling, you want it to cool off?

Mr. Millar: Yes, we spread the curd out evenly and keep spreading for fifteen or twenty minutes and then turn it frequently until it is ready for salting. We do not use any means for keeping up the heat, in fact, we would rather cool it down.

Mr. Aderhold: How high do you pile?

Mr. Millar: It depends on the condition of the curd. If we have a good working curd without any pin-holes, I think two deep is quite sufficient. You will note that I said in piling in the sink just to mat, we leave it six or eight inches deep.

Mr. Aderhold: How thin would you mat it out before you grind?

Mr. Millar: That would depend on the condition of the curd also. We do not go on the thinness su much as the condition. If we get the curd flaky or meaty, that is the point rather than the thinness or thickness of it.

Mr. Aderhold: How long do you allow it to mat from the time you put it on the racks until you grind?

Mr. Millar: Usually about one and three quarters to two hours.

Mr. Aderhold: How long would you leave it lay after, from the time you grind it until you salt it?

Mr. Millar: It requires about the same time in an ordinary working curd. From three to four hours.

A Member: What kind of mill do you use?

Mr. Millar: We use the Barnard Curd Mill.

Mr. McKinnon: You say you rinse your curd?

Mr. Millar: Only when we have bad flavors. Some of our

makers practice washing all the curds, but I cannot see where there is anything to be gained in washing good curd. I do not think a good curd can be improved by washing.

Mr. Noyes: I do not see any benefit in washing a good curd. The great trouble is, when we have tainted curds, when we have a bad flavor we have a white whey that is sticky, like molasses, you cannot expel that without you do wash, you cannot close the cheese up with that kind of curd, at least we failed to do it, and you have got to do something to get it out. If we have a first class curd, we do not wash it.

Mr. Alves: Which do you prefer, the automatic agitator or the common curd stirrers?

Mr. Millar: The agitator by all means. I think at the present time you can buy the agitator at $25 a set, a set consisting of four.

Mr. Alves: Do you not have to use five occasionally?

Mr. Millar: Well, if you have long vats, but take a vat 16 to 18 feet long, and four are sufficient.

Mr. Mason: Can we put the agitators into the vats that we have, or must we go to work and get new vats also?

Mr. Millar: No, that is not necessary, you can put them in any common vat. They will not stir the curd in the corners of the vats, but the advantage is here, say, for instance, you have three vats and the agitators, one man can take perfect care of them, while if we have no agitators, we have to have three men.

Mr. Alves: They will do better stirring than two men can do at one vat, with one agitator in one vat. I have tried it.

Mr. Millar: The agitator wants a little help at the corners, you cannot leave it altogether to an agitator, but one man can take perfect care of three vats with agitators.

A Member: With a good curd, will it not cut it too fine?

Mr. Millar: No, I do not find it so.

A Member: What do you use for a hand mill?

Mr. Millar: We use the Harris curd cutter.

A Member: Have you ever used the Gosslyn?

Mr. Millar: No.

Mr. Waterstreet: Will you explain how you wash your curds and how much water you put on a curd from a thousand pounds of milk?

Mr. Millar: Those vats hold usually from five to six thousand pounds of milk, and in washing the curd from that we would use probably from fifteen to twenty pails of water at a temperature of from 96 to 98. Some factories have the tanks overhead with a hose attached and used in that way, but the majority just take a pail to put it on, put on a pailful and two boys will stir the curd and afterwards three will stir, after they put on another pail of water, and after the curd is stirred some more, they put on some more water.

A Member: How long do you allow the water to remain on the curd?

Mr. Millar: Just while it is running over. The temperature is from 96 to 98.

A Member: If I understand this agitator subject right, it seems to me it is claimed that by using the agitator it is not necessary to have so many men in the factory, but in washing the curd you have to have a number of men, and I do not see any benefit in having the agitator to stir the milk and curds if you have to have all this help anyway.

Mr. Millar: I said three boys. One man can do it, it is not necessary to have three men, but we get along faster by working all the time, but if you have only two men in the factory, you can wash the curd just as well. Most of our factories employ from three to five men. It is a question of what part of the work they do. We keep the curd at a temperature of 98 constantly.

A Member: Would there be any particular loss in the fat if you cooked it over three hours?

Mr. Millar: No, I do not find it so, if we have the curd evenly cooked. I think there is more in cooking than in any other one thing in making fine cheese, and if you take sufficient time and have your curd thoroughly cooked, not outside, but cooked thoroughly, through and through, you will not have that

loss, neither will you require so much stirring in your sink. That is where a good many cheese are spoiled at the dipping, they are not cooked sufficiently and you have to stir them so much to expel the moisture that you destroy the texture.

Mr. McKinnon: Does Mr. Millar wash his curd immediately after milling, or just before salting?

Mr. Millar: Immediately after milling.

Mr. McKinnon: Does it start the grease on the curd again before salting?

Mr. Millar: Well, we do not find that we have very much grease as a rule, unless it is gassy curd.

A Member: How do you know when your curd is properly dry, what signs do you have to tell when your curd is properly stirred dry when you are dipping it?

Mr. Millar: When you take a piece of curd in your hand and squeeze it, there is a little moisture dripping from it, stir it practically dry, pilei t up deep then and let it mat good and solid before you touch it. The idea that you have to retain moisture at that stage to get a meaty cheese is entirely wrong.

Mr. McKinnon: After you get the curd cut, then you say you stir fifteen minutes without steam, what is the reason that you stir it without steam?

Mr. Millar: Stirring it that length of time, you get your curd in a better condition before turning on the steam, you will find that it will not mat quite so readily as it would if you were to turn on the steam, say, five minutes after cutting. You will find it very difficult to keep these particles of curd apart, and curd that is going to stay in the vat for three hours, if you heat it up quickly, you are likely to get your curd a little hard and dry before the three hours expire. We prefer to take a longer time and cook it slowly.

Mr. Waterstreet: Why is it that in some factories cheese makers are bothered so much with fat running from the curd and in other factories are not?

Mr. Millar: Of course in some cases it is due largely to the handling of the curd and in other cases to the milk. Suppose,

for instance, you get milk that is working fast, there is always a greater loss of fat in the handling of it; again, if the maker himself introduces sufficient starter to get fast working milk, he may get that condition. I say it is entirely due to his own management.

Mr. Waterstreet: Do you think you can overcome this a great deal by cooking higher and more evenly?

Mr. Millar: I think you can by cooking more thoroughly and more evenly, and at the time of dipping, if you retain a large amount of moisture and keep your curd hot, you will have a greater loss of fat than if you expel the moisture and keep your curd moderately cool, or after your heating, if you spread your curd out and cool it, you will not have the loss of butter fat that you would have if you piled it up and kept it warmer.

Mr. Waterstreet: Do you think this holds true in all factories?

Mr. Millar: I think so, yes. For several years I was engaged as instructor for the Dairyman's Association in Western Ontario, and in that capacity I covered a large territory, and I found that these underlying principles hold good in all factories; while you might have to meet some conditions to get some results, the underlying principles hold good in all factories.

Mr. Aderhold: I would like to ask Mr. Millar if he does not find abnormal milks that will cause a considerable loss of fat from the curd, no matter how it is handled?

Mr. Millar: Well, we do occasionally, but not frequently. Of course you might say in changes of season, after a very dry spell, or vice versa, you will find that the milk will work differently, and of course different methods have to be introduced to get the best results.

Mr. McKinnon: We have had some sour cheese up in our section of the country for the last year; we have always been bothered more or less. Now, I have always claimed that the sour cheese that we have up there is because the moisture has not been sufficiently excluded or drawn from the curd while the curd was yet in the whey, and that in order to overcome that

difficulty, we have got to be sure of the fact that the whey is out of the curd before we undertake to get the curd out of the whey. Now, is there any other way of getting that whey out of the curd than by using heat? In your estimation, can it be stirred, can it be manipulated in any manner so as to exclude the whey if it has not in the first place been extracted by the heat?

Mr. Millar: You have got to expel it by cooking; in fact, you may still have a soft cheese by leaving too much moisture in the sink. Supposing your curd is properly cooked and dipped at the right time, by leaving excessive moisture in the sink you may still have a soft cheese.

Mr. Lepley: I would like to ask Mr. Millar how he would work curd from milk that was overripe when it came to the factory, how would you handle that to get a good curd from it, how long would it stay in the whey? What would you do with it if the Marshall test showed that it was overripe?

Mr. Millar: You speak of the Marshall test. Now, that Marshall test is in use in some of our factories, but the general test is what we call the rennet test, so that I do not quite know what per cent. of acid your milk would show. But to get the best results from working overripe milk, I would set it at a lower temperature, say 82 to 83 degrees; I would not put any steam on the vat until I had all the milk in the factory, or at least I knew I would have it all in by the time the heat was raised to that temperature; I would immediately make a rennet test, or whatever test you have, to find out about how fast the milk was working. I would use an ounce of rennet to the thousand pounds extra over and above what you are using. As soon as it was firm enough to handle I would cut it fine and cook it quickly, draw off part of the whey; just as soon as your curd will stand running down the whey, run it down close. If you have good water, put in some fresh water and endeavor to wash some of it off before dipping; dip the curd, as soon as it is firm enough so that you can stir it in your sink, and stir it thoroughly well and mat it thin. Do not pile it up deep, mat it thin, do

everything you can to check the development of acid. As soon as you have three quarters of an inch of acid on the curd, I would give it time to mature for milling. That is where the mistake is often made with fast working milk, after milling, some of the boys imagine you must salt it immediately. That is altogether a wrong idea. If you followed up the system all over and kept ahead of the development of acid after you have milled your curd, you can afford to wait and let the curd become mellow before salting it, because your yield is a great deal less if you do not.

Mr. Aderhold: Suppose you have just got it milled and you are in doubt as to the development of acid?

Mr. Millar: If I was in doubt, I would wash it in warm water.

Mr. Knickerbocker: I would like to ask Mr. Millar if he would heat that curd, in cooking it, to a higher temperature than 98?

Mr. Millar: Yes, I would cook it at probably 100 or 102, but it is only going to stay in the whey a very short time.

Mr. Knickerbocker: I would like to ask if he ever cooks as high as 108?

Mr. Millar: No, never have. I believe some of the young men in our section tried it last year and it cost them a cent and a half a pound.

A Member: I would like to ask Mr. Millar how he handles tainted milk, from setting to dipping.

Mr. Millar: I would not work it very much faster than the other. If I had tainted milk, I would set it at a high temperature, set it at 88 degrees, and I would use a starter of a good flavor to hasten the development of acid, and after cooking, I would draw off a large portion of the whey; as soon as sufficient acid had been developed, I would heat the curd some two or thre degrees higher, say, 100 to 101, and dip it and give it a good stirring; pile it deep to retain the heat and develop the acid; as soon as the acid has developed sufficiently, and the matting is done, I would mill it and expose it to the air and keep it thor-

oughly exposed by constant stirring, and in some case we have built outside of our factories a shelf where, in warm weather, we can run the curd right outside and expose it to the fresh air. We do not believe in submerging.

Mr. Aderhold: Supposing the acid would not come on your curd, either in the whey or after, no matter what you do with it, what would you do then?

Mr. Millar: If I could not develop acid in any way, I suppose I would have to dip it without acid.

Mr. Aderhold: You would run up against a great deal of Wisconsin milk then.

Mr. Millar: We do not very often get a case of that kind. We usually find we can develop sufficient acid.

Mr. Waterstreet: Would you not get a pinholey curd without any acid in the whey?

Mr. Millar: Yes, generally I would give it a little acid. If you are going to have a pinholey curd, you can usually tell before you set your milk, by judicious use of a pure culture, or a good starter, you can usually get the acid in that way.

Mr. Aderhold: Do you mean that they should make a starter right along, whether they have got to use it or not?

Mr. Millar: I think it is a good thing.

Mr. Aderhold: If they do not need it, then not use it?

Mr. Millar: There is not much loss if they do not need it. Sometimes in a case of that kind it is a great advantage. I am not in favor of using a starter promiscuously, and using it in every vat. In fact, I always test the milk by the rennet test before adding any starter. It is a safe plan to follow, and if you have made your test, you know then about what percentage should be used.

Mr. Aderhold: About what time of the day do you get your milk in?

Mr. Millar: Usually before half past 8 or 9 o'clock.

Mr. Aderhold: If you got it about 7 o'clcock, you would use a starter every day?

Mr. Millar: If you are getting it in about 7 o'clock, I think

you would find it necessary to use a starter, because the milk would not have time to age before being delivered.

Mr. Waterstreet: Is it not better for the maker to get the milk about half past 7, instead of 8 or 9?

Mr. Millar: It would be better, but if people have a good ways to come, it is difficult to get to the factory before.

A Member: How long does it take you to make cheese, from beginning to end?

Mr. Millar: From 7 to 8 hours.

Mr. Mason: Do you ever handle floating curds?

Mr. Millar: Very few of them.

Mr. Waterstreet: How do you handle a floating curd?

Mr. Millar: Well, in my own experience I have only had two floating curds, and that was while I was on the road as instructor. I remember very well the first floating curd I ever saw. Just before going in to dinner I said to the cheesemaker, "Now John, you better dip that," and he said, "Oh no, it has not got acid enough." In my judgment he had acid enough. When we came out from dinner it was all on top of the whey. That was the first floating curd I ever saw, and there was almost half an inch of acid. We dipped it out and kept it as warm as we could, and he made a fairly good cheese out of it, but it took a long time to make it. He practiced the method I have been trying to give you, only he developed more acid than he should.

Mr. Waterstreet: You say that the curd had a half inch of acid?

Mr. Millar: At the time of dipping.

Mr. Waterstreet: It did not hurt it any?

Mr. Millar: No, it did not hurt it any. But the next day in the factory I was in we were going to have a floating curd and I dipped it before floating. We dipped it with a quarter of an inch acid, and while we had a very spongy curd, yet we made a good cheese out of it, the flavor was not just right.

Mr. McKinnon: You say we will usually know when we are going to have a pinholey curd; is there any way of determining that except by the odor?

Mr. Millar: Well, you can tell by the working of your milk. As a rule, if you find that it is maturing very slow, if, for instance, you try a rennet test at 9 o'clock, and you will find it testing, say, with the Marshall test, 1½, and you test again, and find in half an hour that it is practically in the same condition, you may then look out for something of that nature.

Mr McKinnon: Did you ever grind your curd twice, and check a floating curd, or pinholey curd?

Mr. Millar: I have, but I do not think it is a good plan. You lose a lot of butter fat and you do not get as nice a texture.

Mr. Aderhold: I would like to call the attention of the audience to one thing here, and that is that Mr. Millar, in handling tainted curds and pinholey curds and floaters, always expects to get a good acid, and it seems to me a good idea. Now I believe in the other system of making cheese as Mr. Millar has described it. During the past few years I have tried to practice it. This past season it probably would work all right in a good many cases, but from the year beginning 1894 up until the year including 1901, I think anybody that would try to practice those rules would have met with a great deal of discouragement, and I believe a good many of you know that if we had floating or tainted curds, as he had, instead of getting that half inch of acid in the whey, we would not have got it, in the whey or later. That is one peculiarity of Wisconsin milk; when there is anything wrong with it, if it is tainted, it seems to stop the acid.

Mr. Noyes: Cannot we use starter enough to get the acid out of that curd?

Mr. Aderhold: We are using an abnormal amount of starter and it is because of that condition of the milk that we are using so much starter that our process of making takes about an hour or an hour and a half less time than what Mr. Millar speaks of. We have got to get in many cases, in order to get the acid, the milk overripe. If our milk was normal working, we would get the acid normal, we would not need to use such a big starter.

Mr. Helm: I would like to ask Mr. Millar how much acid he had on his floating curd before salting?

Mr. Millar: We do not go much by the acid for salting, because you are all aware when a curd becomes buttery, or greasy, that the hot iron test is a very poor guide, as far as the acid goes. We attempt to get an inch to an inch and a half of acid at the time of milling, then we go more by the feeling of the curd. We want it to melt and to feel nearly as velvet, a nice smooth curd, with a nice cheesy flavor. If you find in a tainted curd, or bad flavor, if you can get what you call the cheesy flavor coming up through and the other disappearing, in 99 cases out of 100, when that cheese is cured the bad flavor disappears and the other keeps proportionately.

Mr. Mason: I would like to ask how long it takes to salt the curd?

Mr. Millar: Until the salt is thoroughly dissolved usually takes from 15 to 25 minutes, according to the heat of your curd and the amount of your moisture. We use the dairy salt known as "Winslow Dairy Salt;" it is a nice, fine salt, and if the conditions are normal it will dissolve in about 15 minutes.

Mr. Noyes: How much salt do you use?

Mr. Millar: For summer cheese we use about 2½ to 2¾ pounds of salt to a thousand pounds of milk.

Mr. Noyes: Do you prefer a fine to a coarse salt?

Mr. Millar: Yes, it is not as fine as a butter salt, but we do not like the coarse salt.

Mr. Waterstreet: Is there anything gained by letting the curds lie in the sink before the salt has dissolved, before hooping it?

Mr. Millar: I do not thing so, but we are not in a hurry to apply pressure, we think if the curd is allowed to stand in the hoop a few minutes before applying pressure it naturally settles into a normal state and you get better results.

Mr. McKinnon: You get a straighter, or more uniform cheese in regard to size?

Mr. Millar: Well, they claim that you get a closer grained cheese if you do not apply the pressure at once. For instance, if there are pieces of curd crossed in the cheese, you may have

little conical holes by setting the pressure too quickly. I think there is something in it. I know one of the most successful cheese makers we have in Canada is very particular in that regard.

Mr. McKinnon: Are you troubled with mottled cheese in Canada in the fall?

Mr. Millar: Yes, in the fall we are sometimes troubled with it, and of course, that is a knotty problem, the mottling cheese. I find in our own factories, when we get a curd that is not cooked properly, we get mottled cheese. If we get the moisture expelled at the right time, we never have it.

Prof. Woll: If we are done with questions in regard to the details of manufacture of sheese, I would like to go back to the question that was under discussion a little while ago. Mr. Millar is an experienced cheese maker, and has been a close observer of conditions on the American cheese market, I would like to ask him in regard to the qualities of cheese made from, say, four per cent. milk and three per cent. milk, whether the buyer discriminates between cheese made from those two pualities of milk, or whether the general public will discriminate between those two cheese?

Mr. Millar: I might say right here that the buyers do not discriminate sufficiently between cheeses made from the different qualities of milk, and I will say further that if the dairymen of Wisconsin decide to make all their cheese from 3 per cent. milk, that we Canadians will never have anything to fear from your competition.

Mr. McKinnon: In connection with that I would like to ask, how does your milk test in July and August, that is, normal milk as it comes into the factory in July and August?

Mr. Millar: The average is about 3½ per cent. in the early months. It will probably run in April and May, about 3.1, 3.2, and 3.3; that is, the fat, I am speaking of the fat average, and in June, July and August, it will run from 3.3 to 3.6.

Mr. McKinnon: I do not exactly understand, when you have your poorest milk.

Mr. Millar: April and May, about 3.1 to 3.3, that is the average for fats, and as the season advances the milk becomes richer until in the fall it runs up to four per cent.

Prof. Woll: How are the prices for cheese at those different seasons?

Mr. Millar: That depends entirely on the state of the market. Sometimes they pay more for April cheese than for any other cheese. That is entirely due to the demand. You cannot apply that in this case, because if the market is very bare of cheese, you will get high prices even for poor qualities.

Prof. Woll: Is it not a fact that ordinary September cheese will command a higher price than April or May cheese?

Mr. Millar: Other conditions being equal, it will command a much higher price.

Prof. Emery: How much rennet do you use from year to year?

Mr. Millar: For the different seasons we use different quantities. In the spring of the year we use from four to six ounces, or about enough to get the curd in eighteen to twenty minutes. In the summer months we use three ounces, or sufficient to get it in thirty minutes. In the fall of the year we use about the same amount and get it in thirty-five minutes; it takes a little longer as the season advances.

Mr. Aderhold: How much salt do you use in the fall of the year when you get your biggest yield?

Mr. Millar: During the past season we have not salted to more than two and three quarters pounds at any time. We use that for October and November. Our yield then is about 9.60 pounds of cheese, or 10 pounds of milk to make a pound of cheese.

Mr. Aderhold: Did you not formerly salt a little higher?

Mr. Millar: Yes, we did, but we found it was not necessary. We used to salt high and use a lot of heat; we found it more economical to use less salt and less fire.

Prof. Woll: Have you had any experience in regard to the loss in weight during curing time of cheese made from rich milk and cheese made from poor milk?

Mr. Millar: We had some experiments carried along that line, but I could not say exactly the result. It is some years since they were conducted, and I could not say how much it was. In our practical work we have not made any tests along those lines.

Mr. Helm: I understand Mr. Millar to say that they grind the curd at an inch and a half of acid, and then salt two hours after grinding. Does it not develop more acid then after lying there till salting time?

Mr. Millar: Not very much after the milling. Understand that in a good curd you would not develop an inch and a half of acid. In a tainted or pinholey curd, we endeavor to develop about an inch and a quarter, that is really enough. Another thing, you have got to consider that your market is entirely different from ours. Our cheeses are all made for exporting and we have necessarily to make a heavy-bodied cheese to have it carried through the different stages of shipping and ocean voyage and all that. It is necessary to have a heavy-bodied cheese in order to have it arrive in England in fine condition.

Mr. Helm: If we are to go in the direction of using 3 per cent. milk, what encouragement is there to the patron to produce 4 per cent. milk for the cheese factories if he is not to be paid anything in addition to what the man receives who produces the three per cent. milk?

Mr. McKinnon: We make a decided distinction, a distinction that we believe to be absolutely just. We do discriminate in the point of prices, but we do not make that great discrimination that you men are advocating here, that is all, the difference is not very much, but it is some.

Mr. Noyes: And your patrons have to take your judgment on that?

Mr. McKinnon: They are quite willing to take any judgment on that in preference to taking your Babcock test straight.

Prof. Woll: Allow me to say in regard to the losses in weight during the curing of cheese made from rich milk and from poor milk, that it has been found in long continued experiments that

cheese made from poor milk will lose more in weight during storage or in the curing room than if made from rich milk, for the reason that such cheese contains a little more water, it is water in one case and fat in the other.

Mr. McKinnon: Then there is more water in the cheese made from poor milk than in the cheese made from rich milk?

Mr. Aderhold: I am going to take Mr. McKinnon's part, not because he advocates adding two to the per cent. of fat, but because it would be impossible for him to enforce the other system. His patrons would not accept the straight test, he would lose them and he would be put out of business, so it is a great deal better to modify the thing and add two per cent. and in that way give the fat a pretty good recognition. It would be better to do that then to pay so much per hundred weight of milk regardless of the fat contents, and if you people were in his boots, or in the boots of any of his neighboring cheese makers, you would probably do the same thing. If you are going to use the Babcock test at all, it is a great deal better to do that than to pay by the hundred weight of milk.

The President then introduced to the Association Mr. R. H. Odell, of Milwaukee, who spoke as folows:

IMPROVED METHODS OF HANDLING AND MARKETING THE CHEESE PRODUCT OF WISCONSIN.

R. H. Odell.

Representing the Merchants and Manufacturers' Association of Milwaukee.

Mr. President and Members of the Convention:

This is not a job of my seeking. I have seen too much of this world to go looking for trouble. Forty years to the rear I quit putting chips on my shoulders as bluff games. But as a member of the Merchants' and Manufacturers' Association of Mil-

waukee, the brightest "bright spot" in the whole galaxy of American cities, I dare not refuse to try to perform any duty which the respected head of that organization places upon me. That is why I appear before you.

The public has been informed, through the newspapers, that a centralized system of disposing of Wisconsin cheese is a plan of Milwaukee merchants. By similar authority we are told that some persons supposed to be in favor of such a system are opposed to it, and that the cheese producers of the state are awaiting a proposition from Milwaukee merchants as to what they propose to do. In part, at least, such information is wholly erroneous. Every expression heretofore given publicity, as voicing the sentiments of the business men of Milwaukee, and all correspondence between organizations upon the subject, have explicitly stated that Milwaukee could not, and would not, presume to take any initiative in the matter; that if such an organization was wanted the demand for it must come from the cheese producers of the state, and that, if such demand came, the merchants and all business interests of Milwaukee would be found ready to meet it and give it the most generous assistance in their power.

The business men of Milwaukee are loyal to Wisconsin and the best interests of its progressive people. They believe Milwaukee is a part of this grand state. They are partial to the best interests of Wisconsin. They are not opposed to the upbuilding of the best interests of the people of adjoining states. But they are for Wisconsin, first, last and every day. It is not their purpose to engage in any sort of war with any other point or city over the disposition of Wisconsin products, *against the wishes of the producers of those products.* If those producers can obtain better service, better reward for the fruits of their labors, elsewhere, Milwaukee business men will not only bid them a cheerful welcome to accept it, but will extend their best possible aid in securing it, for the general good of the state to which they are most loyal.

If the dairying interests of Wisconsin want a centralized sys-

tem of disposing of their products, and want the aid of Milwaukee business interests to assist them in obtaining it, and will indicate the kind and quantity of assistance they need, they will find Milwaukee business men right out in the open, ready for the fray, to give them every aid and encouragement in their power, in an honest, advisory, working way, as true assistants in a worthy undertaking. But as dictators—NEVER. If the dairy interests of Wisconsin want Milwaukee's aid in the matter brought here for consideration, it is theirs for the asking. If they do not want it, Milwaukee business men would like to know that fact.

I shall not presume to discuss "Improved Methods of Handling and Marketing the Cheese Product of Wisconsin" with the force of eloquence, or with the satisfaction to you, which would have characterized the handling of the subject by that master of eloquence to whom it was originally assigned, nor yet with the profundity which would have been given it by the esteemed president of that association in whose name I am commanded to be here. It will merely be my endeavor to try to give you some plain, comprehensive thoughts upon the question.

The cheese produced in Wisconsin in 1902 is said to have been worth $9,000,000. I believe that a conservative statement. The sum named is about one-fifth the total value to this state of its dairying industry, annually. Nine million dollars is a big bunch of money. It is so great that apparently trifling leakages in its gathering may amount to a fair fortune in the aggregate. If there are any such leakages, the men who produce and market the goods ought to be best qualified to tell where they are. And their well-ripened experience ought to be something of a guideboard to a remedy. It would seem presumptuous on the part of a so-called city man to even think of giving them a "starter" on the road. But mere suggestions may be permissible.

I take it as a reasonable presumption that present methods of handling and marketing the cheese product of the state are not

wholly satisfactory. If they were, this question would hardly have been brought into this convention for the consumption of time. Apparently, a new and better method or system is being sought, and it would hardly be out of place to ask: Who is seeking it? Is it the producer or the present buyer? The natural inference is that it is the producer. If that presumption is correct, why is the producer seeking a new method of marketing the product? The assignment of the subject, on the program, is a whole grave-yard of silence upon this important point. Yet I am commanded to, inferentially at least, discuss the question.

The magnitude of the cheese industry of this state, as a great wealth-producing factor, justifies giving the most careful attention to the prime feature of the question under consideration—marketing the product. If new methods are wanted, it would seem that out of the experiences of men long engaged in making and marketing the product should come richly matured ideas looking towards establishing a method, or system, more satisfactory. To the trained business mind there is a seeming possibility of preposterousness in looking to those engaged in other lines, and possessing no detail knowledge of the cheese business, for more than suggestive thoughts upon this important question.

The marketing of $9,000,000 worth of products, in any specific line, seems worthy of the best thought and the quickest possible perfection of a system as nearly faultless as the genius of man can produce. It would be difficult to find another industry of such wealth-producing magnitude upon this continent without a thoroughly perfected system of handling and marketing its products. This is an age of concentration of efforts and systematization of methods, both in the production and marketing of the products of investment and labor, throughout this country. Experience has taught producers of the world's marketable commodities that concentration of effort in the disposition of them not only reduces the expense of handling and marketing, but has a steadying influence upon markets, brings uniformity in both products and prices and gives better returns,

financially, even though higher prices are not a feature of the result sought.

I am informed, by an extensive dealer in cheese, that there is, under the present system of marketing it in this state, a considerable variation in prices at which it is sold, at different points, on the same day, even where cheese is believed to be of uniform quality, and at points from which freight rates to the great marketing and consuming centers do not differ.

If such is the case, the reason therefor may possibly be in the present system of marketing. You who are the producers and marketers of the products are the ones to locate the reason. One-eighth of a cent a pound on a carload of 30,000 pounds of cheese means $37.50. A quarter of a cent a pound would double that sum. The difference when applied to a single pound is insignificant, but in the aggregate it becomes worthy of consideration. If you can locate faults in your present methods of marketing, and the system can not be so corrected as to eradicate those faults, it would seem to be in the direct line of good business to seek some different system of disposing of this great and valuable product.

Doubtless, results which have attended the centralization of methods of marketing other lines of product have not been without an influence in generating thought and discussion along the line of centralizing the marketing of the cheese produced in Wisconsin. Men of careful thought and wide experience are of the opinion that a centralized system, wisely conducted, would redound very largely to the financial benefit of the producers. One of the best informed dealers in cheese in this state tells me he is confident that, in a very few years, the proceeds from the same tonnage of cheese would be increased at least 10 per cent. This would mean $900,000 a year more to the producers, even were the cost of marketing not reduced, and he it is equally confident that it would be less expensive to market by a centralized system than by the present methods.

If you desire to establish a new system of marketing cheese, it is safe to say, on general principles, that you will find oppo-

sition to the project. From whence such opposition will come, is not for me to predict. It is for you to learn. When it comes, you will be able to locate its source, and it will be for you to weigh and judge its purpose by its source. You will be able to determine whether it is a matter of sincerity, in your best interests, or on behalf of those otherwise interested.

The question of freight rates for your products to a central or selling point, and from there to other distributing points, will be a matter for consideration. I am informed, by those who ought to know whereof they speak, that there need be no fears but you can obtain rates not more expensive, upon the whole, than those existing under present methods. This, however, will be a matter not difficult to determine, as all transportation companies to whom your business is available, will be desirous of obtaining it.

I am requested, by the association for which I am delegated to speak, to embody, largely, in my remarks, an article published in The Milwaukee Sentinel, in its issue of Jan. 1, touching upon the question in hand, and here quote from it:

"In The Sentinel's annual business review, a year ago, some remarks were made regarding the importance of establishing a dairy board of trade in Milwaukee. It was not held that Milwaukee should, or even could, establish such an organization. On the contrary, it was held that the demand for it must come from the producers of those products in the state. What were believed to be the cardinal features of importance in having such an organization were shown by a marked lack of uniformity in prices obtained for cheese, supposed to grade alike, on the different dairy boards of the state, and at points from which freight rates to large distributing points are the same. Quotations of sales at such points in the great cheese producing regions of the state during 1902 only emphasize the comments made a year to the rear upon this specific and highly important feature of the dairy business in Wisconsin. They indicate a variation of one-eighth to one-fourth of a cent a pound at different points upon the same days for cheese supposed to

be uniform in quality—at least made by graduates of the same dairy school and working under the same principles.

"This is a condition which ought not to exist. But its existence cleady establishes one of two points: Either that an injustice is being done some one of the producers in the prices they receive for their products, or that some of the cheesemakers are not making as good cheese as they should. This is the condition. Where is the remedy?

"Clearly, the remedy is not in a multiplicity of dairy boards at which many buyers do the grading of the goods, as well as make the price. This system has been working long enough to have established a remedy, if it possessed one. But the remedy, when found, will not likely come far short of having its origin in one system of grading cheese, and by one set of experts, whose duty it is to do absolute and exact justice to both buyer and seller, and the making of uniform prices for cheese, according to the grades. This would insure a uniform price for uniform product. And, if there were anything lacking in the skill or dilligence of some of the makers, it would stick a pin where they would find some difficulty in dodging it. Experts competent to do the judging would hardly be found short in their ability to tell makers where the weak points were in their work and how to obviate them. Such a system, honestly conducted, would have a natural tendency to improve the quality of Wisconsin cheese and lay a corresponding financial benefit in the hands of the producers.

"That Wisconsin is well to the top in the means of educating and producing cheese makers of a high order, is shown by the demand for them from all parts of the world where dairying is pursued. But there may be a difference in the progress they make in the practical use of knowledge gained in the dairy school. If there is a better means of giving aid to such progress than by a uniform system of grading, by the best of skill in that work, the publisher of it would confer a well-ripened favor upon the cheesemakers and dairymen of the state.

"No discredit is reflected upon any one by the acknowledge-

ment that Wisconsin dairy interests have been benefittted by the pursuance of methods practiced in the same industry in Canada. And that as good cheese is made in Wisconsin as in Canada, or in any other country, is undoubtedly just as true. But there is a lack of uniformity in quality here, in which the Canadian product excels. At the Industrial Exposition in Toronto, last September, the cheese exhibits in competition would aggregate fully fifteen tons of the product. It came from a stretch of country over 3,000 miles long and was produced in all climates, from the salt sea breezes of Nova Scotia to the foothills of the Rocky mountains, in the great Canadian Northwest. That pile of cheese was judged upon its merits by one of the best cheese judges in the world. When the work was done, he told the writer hereof that there was but one cheese in the entire collection which fell more than six points in a possible 100 below the best sample, while fully four-fifths of the entire exhibit scored 96 to 97 points. There was uniformity of product, regardless of the varying conditions of climate and stock foods which it was produced. Such a result is the fruit of persistent effort during more than a score of years on the part of the agricultural department of the Canadian government for the production of cheese of uniform quality. The aim has been to produce cheese which would stand firmly in the markets of the world upon their merits, alone, and the grading given them by their makers or home inspectors. And that end has been attained. At this time, cheese bearing the Canadian brand needs no other sponser in the world's leading cheese markets. But this result has not been reached without the most dilligent effort. The government has kept the best skilled instructors in the field persistently educating the cheese makers of the Dominion and inspecting the product by one absolutely iron-clad rule. Wherever errors were found they were corrected, and the result is now seen. That it has cost a lot of money there is no doubt, but that the end accomplished fully justifies the expense will be strongly testified to by every well informed dairy farmer in Canada.

"If any person thinks such results can be reached in Wisconsin by methods now in practice, such a one should get into a line of self-undeceiving in a hurry. Time past, and present conditions clearly demonstrate the fallibility of such a course and indicate the disappointment which must eventually follow, while yearly deficiencies from proper results in the pockets of the producers need no more time to strengthen their arguments.

"That the suggested system, a dairy board of trade, with the best skilled inspectors, thoroughly alive to their work and ever on the alert to correct the errors of cheesemakers, would accomplish uniformity of product there is practically no room to doubt. But it would not be done in a day, nor yet in a year. It might require a dozen years of careful work to eradicate all existing errors and place Wisconsin cheese in as enviable a position in the cheese markets of the world as that now occupied by Canadian cheese. But such a result could be accomplished by the suggested method, while it never will be by present methods, and the constantly increasing financial returns would pay the cost all the time. To-day, the brand, "Made in Canada," on a lot of cheese in any dairy market in the world commands that respect which brings to it the top market price, without further inspection. Will some one tell what a brand "Made in Wisconsin" would do to a bunch of cheese laid in any foreign market? That it ought to command as high respect as does the Canadian brand, is true. But does it? If it does not, why? And if it does not, why not get in line to make it? Wisconsin is not second to Canada in its natural characteristics as a great cheese-producing region. The man who would declare to an audience of Wisconsin farmers that it is would do well to occupy a position close to an open door and have an imigration ticket in his pocket.

"The writer is well aware he is not writing words which will win him the undying love of the owners of cold-storage houses throughout the state. But that can't be helped. There are other interests which ought to be advanced, and they are vastly more important to the dairy farmers who care for the more than 1,000,000 cows in Wisconsin.

"That the suggestion made in The Sentinel a year ago fell upon some fertile soil is clear by the fact that in every dairy meeting of importance held in the state the matter has been discussed and interest in it is growing. Some day the idea will materialize into operation frutful to the bank accounts of the dairymen of Wisconsin. The great army of them will not always remain in Egypt. Demand for the needed reform must come from them. They are the power behind the throne, and when they move with determination and unanimity of purpose they will be the mighty force which will start their best interests towards the point where cheese wearing the brand: "Made in Wisconsin," will stand alone and command highest respect in the market of the world."

The President stated that Prof. J. Q. Emery was in the audience, and as Prof. Dean of Canada, who was to give the first address on the programme for the afternoon had been delayed in reaching Milwaukee, he would ask Prof. Emery to give a short address at the opening of the afternoon session.

Adjourned till 2 P. M. Thursday, January 8, 1903.

AFTERNOON SESSION.

The convention met at 2 o'clock P. M.
President Dickson in the Chair.

ADDRESS.

Prof. J. Q. Emery, State Dairy and Food Commissioner, Madison, Wis.

Mr. President, Ladies and Gentlemen:

I am here in two representative capacities, as President of the Wisconsin Dairyman's Association for this year, I extend to you the greetings of the Association and second the invitation that was extended to you this morning by the gentleman who invited you to come to Fond du Lac to attend that meeting. We are all the same great family of dairy interests, and in that respect I feel towards you as the little girl did towards her mother. She was getting some special favors from her mother, and was in a very excellent state of mind one day and she said, "Mama, I am so glad you were born into our family," and I am glad that this Wisconsin Cheese Makers' Association has been born into the great dairy family of Wisconsin, and I have in the past year been reading with a great deal of interest the history and the workings of the pioneer association in this great dairy industry of Wisconsin, the Wisconsin Dairyman's Association. We all recognize that the great moving spirit in that organization, and one of the moving spirits to continue in it from that day to this has been our honored friend, former Governor Hoard, who met, with others, in 1872 and organized the Wisconsin Dairyman's Association. There were certain conditions then present in the state that made it necessary for them to organize that association and to prosecute the work in the wonderful vigorous manner in which it has been prosecuted.

They found conditions something like these, that they were producing cheese, but to brand it as Wisconsin cheese was to put a taint upon it and to bar it from the markets of the country. They had to leave it to grocers to take what they could get. I think it was Mr. Smith who spoke of their having to let pump peddlers take it and see what they could get out of it, they were almost in need of calling into service the lightning rod men to take around the cheese and peddle it, and that others who had good friends down in Chicago who would receive this cheese and would take the poorest of it and label it "Western" or "Western Reserve" and sell it as a superior article of cheese. One cheese was labeled "New York" and sent to the Eastern markets and sold, not as Wisconsin cheese, robbing the manufacturers and producers of that cheese of the legitimate results of their efforts And so that organization was effected and its efforts directed to the bringing to the notice of the public, the dealers in cheese and the consumers of cheese, the excellent qualities of Wisconsin cheese; and if you will read the history of that association and the wonderful progress it has made, you will be impressed, I am sure, as I have been impressed, with the great achievements of those men,—the difficulties of transportation that confronted them; and they vigorously addressed themselves to the task, they sought means of transportation, the best means, and thy called into service and initiated in Wisconsin the means of refrigeration, so that they could put their cheese on the eastern markets when its quality had become known and receive for it what they should receive. They took pains to have this cheese exhibited at various expositions, the World's Exposition at Philadelphia and other great expositions in the east and in our own state, and you know something of the history,—how they went on their merits and gained reputation for Wisconsin cheese. It did not come without effort; it came as the result of most strenuous efforts.

Now, as I have listened to the discussions here in this meeting, I have observed that while they have made wonderful progress, that still they have not reached perfection; there is still a

large amount of work to be done and along lines that then confronted the men in those early years. In 1871, according to reports of the early associations, there were produced but 6,000,000 pounds of cheese that sold for eight cents a pound. In 1873, very soon after the organization of that association and its efforts, there were produced in this state 10,000,000 pounds of cheese and sold at ten cents a pound, and continued progress was made and has been made, and yet I find that you are discussing here how to improve the qualities of the cheese in the various multitudinous ways in which it can be improved. You are also discussing, or propose to discuss, means for a better market for cheese, that the good qualities of the cheese that you make shall be recognized and that the producers shall receive just compensation for it. In conversation with one of the leading merchants, dealers in cheese, I was greatly pleased to hear him say last night that the Wisconsin cheese ranks better than New York cheese in its qualities, and I was greatly pleased at the enthusiasm that he manifested in his appreciation of the quality and rank of Wisconsin cheese. Now, when I went to the desk of your President yesterday morning, I said to him I thought I was entitled to membership in this Association, because I claim to be interested in advancing the interests of pure and unadulterated cheese and other pood products, and so I feel that I am under oath of office to do this as Dairy and Food Commissioner of the state. As such I am not here to instruct you about making cheese, you do not expect that; I am here to assure you that I meet the conditions my friend, Gov. Hoard said should be met, a person who in life and in purpose of life is in deep sympathy with the dairy interests of Wisconsin, and so far as the Dairy and Food Commission of the state is concerned, it will devote every possible effort to the enforcement of the dairy and food laws of the state, in so far as they relate to the dairy interests. Of course you are familiar with it; it means that we shall have pure and unadulterated milk given to the factories; it means that there be the best obtainable service in the manufacture of this product and in the distribution to the consumers. Wisconsin was unfortunate during a few years

in falling from her high estate; she dared to tolerate fraud in the manufacture of cheese, and she has been paying the penalty, and you and I are mutually interested, as are all good citizens of Wisconsin, that this fraud should not again be attempted, and that all the dairy interests of the state should be united in producing the very best quality of dairy products, whether cheese, or butter, or milk in the milk supply of cities.

Now, while I have said to you that the dairy and food commissioners have devoted all their energies and all their efforts they can command to the enforcement of these laws, I have to state to you that that office is not sufficiently equipped with forces to enforce the dairy and food laws of the state properly. As Mr. Hoard wrote me only a few days ago, the state of Minnesota is getting in some respects in the eastern markets the lead of Wisconsin in the same line of dairy products, and he said because the state of Minnesota has a large force of commissioners to enforce the dairy laws of the state; where we have one inspector, Minnesota has ten. Now the dairy and food commissioners' office has an assistant, outside the commissioners it has one inspector; it has one chemist—will have, when the person is found, a stenographer and a clerk. That office needs an increase in its working force, and I want to ask you—I want to extend favors to this Association in the way of enforcing laws, and I want you to reciprocate by helping that influence through your influence with the membres of the legislature, to have a better force for the enforcement of these laws, and I ask your co-operation to that extent. I think the Governor will recommend an increase, I do not know how large an increase, but an increase is needed; we ought to have more than one chemist, we ought to have 8 or 10 inspectors; I do not expect we can get them, but we ought to increase the number that we have, so that the work that is laid upon the office can be done. You are especially interested in this work, the dairy work, but there is another large department, the department of foods, groceries, extracts, the sugars, the syrups and the lards, and the multitude of foods that require inspection, analysis and report, and the enforcement of the laws in regard to them. Now, gentlemen, I

thank you for your attention to me, and I am glad to be here to lend my influence to any efforts that you are putting forth to advance the great dairy interests of the state.

The Chairman: Since the organization of the Cheese Makers' Association some eleven years ago, there has never been a year pass but we have had with us Mr. Everett of Racine. Mr. Everett was on the program for tomorrow, but by a visitation of the Almighty, he has been deprived of his wife, and they write us that it will be impossible for him to be here. Now, I would like to have a special resolution passed, extending the sympathy of the Association to Mr. C. H. Everett of Racine, in his sad affliction.

It was moved by Mr. Aderhold that a resolution of sympathy and condolence be extended and telegraphed to Mr. Everett by the Association, which motion was carried by a rising vote.

THE DESIRABLE QUALITIES OF CANADIAN CHEESE.

H. H. Dean, B. S. A., Guelph, Canada.
Prof. Dairy Husbandry, Ontario Agricultural College.

Mr. President, Ladies and Gentlemen:

When I reached Chicago this morning, the train was two hours late, and I was unfortunate in missing connections, therefore was unable to get here before two o'clock this afternoon. However, I am here and at your service, and I trust we shall be able to gather some points of value, some information, you from me, and I more especially from you. In Canada we have been watching more particularly the rapid strides which have been made with reference to the cheese business in the state of Wisconsin. You all know that at the World's Fair we rather thought in Canada we had a pretty big lead in cheese making on the United States, but last year at the Pan-American, it was

found that Canada had not such a lead, especially on the makers of Wisconsin, as we thought that we had, and it has stimulated us to do greater and better work than we have ever been able to do before, and we hope that as you increase in your production, increase and improve your mthods of manufacturing, that it will prove an incentive to us to do better work, so do not go away with the idea that Mr. Millar and I have come over here to tell you anything; we want to gather all the pointers we can and take back to our people, as we depend a great deal on the cheese industry, and possibly by way of introduction I might be pardoned if I refer briefly to some of the things which we are doing in Canada to improve the cheese industry.

In 1890 we exported $9,000,000 worth of cheese and we thought we were doing pretty well. Some people said there is no use building any more cheese factories, it is unwise to manufacture any more cheese, we will not be able to sell it. However, we went right on making more cheese and in 1900 we exported $20,000,000 worth of cheese, and this past year the probabilities are that we shall export over $25,000,000 worth of cheese. Now, while we have increased our cheese production, we have also increased our butter production. Not only that, but we have been increasing a side line, which is very important to our dairymen, namely, the production of bacon. In 1890 we exported, in round numbers, $645,000 worth of bacan; in 1900 we exported $13,000,000 worth of bacon, so you can see that while we have been increasing our exports of cheese, we have not been lying idle with reference to the butter or the bacon industry, both so closely allied in the department of dairying in all its phases.

If you will pardon me, I would like to refer to an article which appeared in the Montreal Gazette within the past year. I just wish to speak of one or two points in this report; the person who compiled the report says, "The cheese season of 1902 has been a record one in more than one way, but three important particulars stand out prominently: the large increase of over 15 per cent. in the aggregate volume of the exports, the fact that this increased output did not lower prices, as farmers

realized on the average of $1.50 per box more this season than last, and, lastly, the marked improvement in the average quality of our Canadian cheese, compared with recent years. The co-operation of the three powerful influences has resulted in one of the most successful years in the history of the trade, for not only have the farmers made big profits, but the middlemen also have come out well on the right side of the ledger, which, despite opinion to the contrary, is not by any means so frequent an occurrence as many imagine. Since the opening of navigation there have been exported from Montreal 2,109,171 boxes of cheese, which have returned to the Canadian producer in round figures about $17,927,000, an increase of $5,400,000 over the returns of the previous season." The part I wish to speak of more particularly in this report is the one which bears especially on the cheese business of the United States, and there is a reference here to Wisconsin, which if you will pardon me again, I will read.

"In fact, before the end of June it became evident that English buyers would have to depend almost exclusively on Canada for their supplies from this side, as there had been a decrease up to that period of over 50 per cent. in the exports from New York. The great bulk of the cheese produced in Northern New York also, which formerly came to Montreal, is now boing shipped to Chicago and the Western States, and large quantities of Wisconsin cheese, which used to find a market here, are now required for consumption in the manufacturing districts springing up in the Southern States. Indeed, many in the trade believe in this connection that before many years Canada will be experiencing a demand for cheese from the United States."

That is a prediction which is made by a person who has studied this question specially for the past year. I find in a report which I clipped from one of your American papers, I do not know which, what bears out this statement.

UNITED STATES DAIRY EXPORTS.

The exports of cheese from the United States during the year ending June 30th last were, says the Official Crop Reporter, issued by the United States Department of Agriculture, less than for any year in the last thirty years. The total was 27,203,184 pounds, valued at a little over two and three-quarter million dollars, as against 39,813,000 pounds, valued at a little under four million dollars for the previous year. In fact, says the Crop Reporter, imports of cheese are now, so far as values are concerned, almost equal to the exports, the imports last year being valued at two and one-half million dollars.

The United States exports of butter are also declining. For the year ending June they totalled a little over sixteen million pounds, valued at $2,885,000, as compared with twenty-three and one-quarter million pounds for the previous year, valued at a little over four million dollars. Twenty-two years ago United States butter exports amounted to thirty-nine and one-quarter million pounds, valued at $6,090,000.

So you see that things point very strongly in the direction that it will not be very long before your people here will probably be importing cheese from Canada, therefore it is well that we should find out what you like in the way of cheese. Now, my particular topic this afternoon is, "What We Think is Good Cheese in Canada," and, as I have already stated, we want to find out what are your peculiarities, what are your likes and dislikes, because possibly before very long we shall be sending you cheese here and you will be buying cheese from us, something which possibly ten or fifteen years ago would scarcely have been thought of. I have in my hand here a report which was issued by the Colonial Producers' Company of London, England, to show you and to illustrate further the text. In their report of December 19, 1902, they say:

"There is a fair demand for Canadian cheese; but the question of price is a most abnormal one. Instead of there being as usual a range of 4 to 5 shillings per hundred weight, accord-

ing to quality, there is virtually only one price, viz.: 60 shillings per hundred weight, and this is due to the further peculiar fact that there is at the present time only one quality on the market, and both colored and white are in equal demand and supply."

Such a thing perhaps has never heretofore been known in the history of the cheese trade. The report says there is practically only one quality of cheese, and I presume our British customers are wondering how it is that the Canadians are able to produce but one bkind of cheese. That is what we have been aiming at for years, that we might be able to supply only one quality of cheese. There have been a large number of influences brought about to solve the condition by which we have been able to make practically only one color of cheese during the past year, the exceptional season, the season that is favorable for a production of a fine quality of milk, and the season was favorable to make a fine quality of cheese. These two things working together, under the wise direction of Providence, we have been able to make practically only one quality of cheese, and the English people are guessing what is the matter with Canadian cheese. We have been making practically but one quality; that is the way we want to keep doing, we want to make but one kind of cheese and that kind first class. I have mentioned the fact that the weather has had a great deal to do the past season in enabling our makers to produce a fine quality of cheese, but other influences have been at work, and have been at work for a number of years. The improved methods of instruction, which, under the direction of the Dairymen's Association and the wise direction of both provincial and dominion legislators, have been able to bring about an improved system of instruction, and we expect during this coming season that we shall improve even more, we expect that before very long, if not next year, in the near future, that every cheese manufacturer in Canada will be under the wise supervision of a man who is an expert, of a man who can go into a factory and show the man where he is wrong, where the fault lies in making his cheese, who can converse with the patrons, can advise them how to take

care of the milk, how to make more money out of their cows, and when we get this improved system of instruction, with some twenty or thirty factories under the charge of a first class instructor, we expect to be able to make greater improvements than we have done in the past.

Another factor which has helped to improve the quality of Canadian cheese is the improved method of transportation. That applies more particularly to the department of agriculture and dairying. Prof. Ruddick, when he was over here two years ago, no doubt pointed out to you what we have done in that connection, but our improved method of transportation in getting the goods on the market in a cooler and better condition have helped to improve the quality and reputation of Canadian cheese, and the methods of making, especially along the lines of uniformity. One of the things we have been trying to get, is to get the makers to make on uniform lines. Now, it was thought that you had to make along certain lines in the Eastern part of Canada, but in the Western part of the Province of Ontario you must make differently. My judgment is, there is but one way to make good cheese, that is, general principles, and there are variations which are so often thought necessary in order to make good cheese, which are not necessary, and the time will come when the cheese makers of Canada will adopt a uniform system of making on general principles. There are slight details which will have to be varied according to the circumstances, but the general principles of cheese making in the making of cheddar cheese are the same all over Canada, and I think also in the United States.

Mr. Millar, who is well informed to speak on that subject, having been instructor, and now manager and large owner of a large number of factories, has no doubt laid down to you this morning the principles of cheese making as he believes they should be carried out in practice, and as practiced in our best factories in Canada. It is not my intention to deal with that phase at all, but what we are trying to get in the cheese factories in Canada is a more uniform system of making and you never can produce a fine quality of goods, uniform quality, un-

less the makers will follow a uniform system. The different methods of ripening or curing cheese have been receiving a great deal of attention in Canada, as you have given attention to them here. One of the most marked improvements which has been brought about by the handling and the ripening of the cheese is the retaining them at a much lower temperature. We have discovered, as you have here, in connection with your own Experiment Station, that cheese may be ripened at a very much lower temperature than was formerly thought possible, and that while it takes a little longer time, we get a better quality of cheese, and a cheese which does not show those defects to which cheese is very often liable, especially if they are cured or ripened at too high a temperature, and the Dominion government, as you have perhaps read in the press, has this past season estabilshed some central curing rooms where cheese from a large number of factories have been sent and they have been cured or ripened at a uniformly low temperature, and this, if it becomes general, and I think it will before very long, will also help to improve the quality of Canadian cheese. Another factor that has had something to do with improving the quality of Canadian cheese is the fact that a large number of our cheese makers either have or are attending our dairy schools. The man who today can think about his work, can tell why he does a thing, as well as how he does it, is a much stronger man than a man who merely knows how to do athing.

I notice on the head of your program that short papers and short addresses are the mottoes of this convention, so I better stop right here and take up the topic that is assigned to me. What is a good Canadian cheese, or a good cheddar cheese, because in Canada we make practically only one kind of cheese, the cheddar cheese. An English writer, Prof. Sheldon, defines a well made cheddar cheese as follows: "A well made cheddar cheese is mild in flavor, solid and rather close in texture, full of quality and mellow, almost as a pear that is ripe." Now, that is the characterization of a first class cheddar cheese as given by a very noted English authority. The most important quality, the most desirable quality in a Canadian cheese, or in

any other cheese, is a good flavor. I have here a sample of cheese made on the 7th day of June last, and cured at a temperature of 40 degrees. The flavor should be mild and pleasant and sweet and nutty, pleasant to the smell and pleasant to the taste. Now, there are very many judges of cheese who say you should not taste cheese. I take issue with those, as I claim you cannot properly tell the flavor of the cheese unless you both taste and smell it. There are many flavors in the cheese which you cannot get by simply smelling them. A man who has a well trained "smeller"—if you will excuse that rather slang phrase—can no doubt judge of cheese very closely by merely smelling of them, but there are a large number of flavors, especially bitter flavors, which are very often found in cheese, which cannot be got by simply smelling; it must also be tasted. Now, if a man is going to judge cheese, he should have his sense of smell and his sense of taste very acutely developed and he should not do anything which would destroy that sense of taste and smell, and as it seems quite natural for me to speak at this time as if talking to one of our boys, I will say, do not use tobacco, if you want to be a good judge of cheese and do not chew; if I had a batch of poor cheese and wanted to sell it, I would sell it to a fellow who smokes and chews quite strongly, and I could work them off much easier on a fellow of that kind than one who did not use tobacco. So we must get that nice, pleasant smell and taste, that flavor and aroma which is so essential in good cheese. Now, where does that come from? I cannot describe to you what it is, there are no words in the English language which will exactly describe the flavor of cheese or butter, or, in fact, anything else. Where does this flavor come from? Well, first, I think it comes from the milk; I do not believe it is possible to make a first class flavored cheese from a second or third class milk, and the root, the bottom, the basis, of good flavored cheese lies in the milk which is produced on the farm and delivered at the factory, and one of the points which we are trying to emphasize in connection with the cheese factory work at the present time in Canada is the importance of getting good milk. I saw by your program that you had a dis-

cussion sometime yesterday on the care of milk. Now, I am considered radical, an extremist, a faddist, if you like, on this question of the care of milk. I have been very severely criticised for what I have said with reference to the care of milk; however, that does not hurt a man after he has been in this business for twelve years; criticism runs off his back like water off a duck's back, and sometimes it is necessary to say things to people to get them thinking. We are told by nearly every person who discusses the question of care of milk, that aerating milk is necessary in order to make it in good condition for the cheese factory business, and I suppose you have had that discussed here. I want to say after three or four years' careful work along this line, that it is my firm conviction that aerating milk, on the average farm of Canada, whatever it may do in Wisconsin, does more harm than good. I will tell you why I think so. We have taken the milk from our cows and we put an aerator just over the fence in the barn yard where the cows are milked, and we run the milk through this aerator where it was hot and dry and dusty, and we made that milk up into cheese, and it was the gassiest and worst cheese that we ever had. Well, people said, "It is all right if you do that around the barnyard, but go away out away from the barnyard." So we milked the cows out in a twenty-five acre field, half a mile away from the dairy department, where there could not possibly be any odor, and we had the very same results. I want to say this, in my judgment the main thing which is necessary in the care of milk to get that fine flavor of cheese is to cool the milk as rapidly as possible after it comes from the cow to a temperature below 70 degrees, and at least 60 degrees, if you can, and that if you aerate milk in the average barnyard, on the average milk stand along the average road and on the average farm, that more harm than good is done to it.

Cooling milk and delivering it at the factory in a cool, sweet condition, should be your first care, and then if the cheese maker knows his business, knows how to ripen the milk properly and use a culture if necessary, then he will get the kind of results he is looking for.

By the way, on that question, I want to say that I do not like the use of the word "starter,"—I think that is an abominable word; I think the word "culture" is the right word to use. A starter is something which starts the ripening, I presume that is the idea. Now, if a culture added to the milk starts the ripening only, it is very good. We want something which will control, which will improve, which will refine the milk into which it is placed, therefore the word "culture" in my judgment is a more correct word.

Now, let me emphasize what I consider the most important point, the starting point, for getting this fine flavor in the cheese, is the milk as it is produced on the farm from healthy cows fed on the right kind of food, and I think our cheesemakers in Canada do not give enough attention to the cow. If the cheesemakers of Canada or Wisconsin are going to improve the cheese business as it should be, they must give some attention to the study of the cow, her food, her care, and how to care for milk, so that a man who drives up with a can of milk that is not right, the cheesemaker is able to tell that man what is wrong and how to remedy it.

That is about as much as I need to say on the question of flavor. We have some bad flavor; I have here a couple of samples that we have been experimenting with this last summer: a fruity flavor, which Mr. Stratton, our cheesemaker, and Prof. Harris, our bacteriologist, have been working with the past season. Now, this is a peculiarly nasty flavor, which has been giving our cheesemakers considerable trouble, more particularly in 1901 than in 1902.

I have here another sample of cheese that has what is called the "vinegar" flavor. Now, that is a very objectionable flavor. Now, these abnormal flavors must receive attention just as well as the good flavors, and one of the questions which we are trying to study in the cheese business is how to give the cheesemaker pointers so that he can overcome these bad flavors.

Now, the next point I have noted is "closeness." We pay a great deal of atention to closeness. We like a cheese that is close and smooth; openness in cheese we consider a most

serious fault, and we lay a great deal of stress on closeness in cheese. It is largely a question of having the curd in the right condition when it is salted and put to press, and applying the right kind of pressure; but there are some kinds of cheese, no matter how much you press them, you cannot get them close.

Next comes texture. Now, the chairman says, "Is not closeness the same thing as texture?" No, it is not. Texture is that quality which the cheese has when rubbed under the thumb and finger, a silky texture, a fine texture, not soft, not pasty, not weak; and on the other hand, we do not like it mealy, but so that it will melt under the finger like wax, without sticking to the finger. That we consider good texture. One of the marked improvements we have found as the result of curing cheese at a lower temperature, is better texture.

Next thing is color. Here there may be some variety. Some markets want what is called a "dead white"; and then on the other hand, there are some markets that want the cheese a "bricky red." Now, the main thing that we look after is that the color, whatever the shade may be, shall be uniform; if it is a deep red, it should be a uniform deep red; if it is a white, it should be uniform white, and uniformity and evenness of color we consider a most important factor in the manufacture of cheese.

Now, the next thing is finish, and I cannot illustrate that to you. The finish, or the make-up, should be stylish. I like that word "stylish," something that strikes you as being more than ordinary; square on the top; no wrinkles on the sides; the body has no collars, either stand-up or lay-down,—those are very objectionable; and the whole of the cheese should be clean and bright and stylish and strike you as having been made by a first class man, a man who takes pride in his business, and I do not think any cheesemaker can give too much attention to finishing up the cheese in such a manner that they strike the buyer. When a man comes to buy cheese, he comes into your factory, he comes into the market, his eye is the first thing that takes in the impression. If the eye takes in a bad impres-

sion, he is very apt to look for faults in the cheese, but if you have got a nice striking appearance, the cheese pleases the eye, you have about half won the customer, and after that he is more inclined to overlook faults which otherwise he may pay attention to.

Then the question of boxes should receive attention. Boxes should be strong, especially for export. Recently some boxes have been put on the market in Canada—not used very largely on account of the price—made of galvanized iron, and if they get the price within the reach of the cheesemaker, it strikes me as an improvement on the elm box, but this box should be strong and fit the cheese and be tasty and stylish.

I am very glad to have this opportunity of meeting with cheesemakers, and as I am to meet you again tomorrow, anything that you do not think of now, you can get out of me tomorrow morning.

DISCUSSION.

Mr. De Land: I would like to disabuse Mr. Dean's mind of the idea that possibly the American trade in the matter of texture would not find open cheese objectionable. I wish to state that we want as close made cheese as is made in any part of the world.

Prof. Dean: I am glad to hear that.

Mr. De Land: In the matter of texture, we started first with the American Association, and we did not want to have too many complicated words, and we put in under that one head "texture," not only the quality which you described, but also whether open or close. Now, I objected very much at the Pan-American classification of cheese in the way of home made, home trade cheese, and expert cheese. I think that is a fallacy. Our home trade cheese, one that will please the most of them, will be a good cheese for export, and a good cheese for export will please a home customer, for this reason a good cheese is a meaty cheese, same texture which you have de-

scribed, and close, and that kind of a cheese, if the milk has been right, will be good flavor and pleasant to the taste and that will please everybody, whether in England or America, and for that reason I think it is bad to make a distinction, and I do not think the factoryman should feel that they want to make a home trade cheese, and make a cheese similar to that one that was more open. Now, I do not like to open this question of taste, for the reason that many of the factorymen present have known my position on the matter of culture, but I would like to ask you the one question: Can and is it usual for the factories to use so much culture that you can find it in the cheese and may give it that vinegar flavor which you describe?

Prof. Dean: I would say that I think it certainly is a bad quality on the part of any cheesemaker to use so much culture that you can taste it in the cheese, and cultures have been abused undoubtedly in Canada, whatever has been done here, and I think it is a great mistake on the part of the cheesemakers to use so much culture. There are certain kinds of milk which are working slowly, and which the cheesemaker, if he did not use a culture, would scarcely be able to make a good quality of cheese out of, and we lay down the rule that a man should never use over one per cent. of culture, and I think that if he follows that rule he will never get into trouble such as you speak of. But this vinegar flavor I think is something which is different from that obtained by using too much culture. If you use too much culture, you get an acid, sour cheese, but it is distinct from this particular vinegar flavor which I have here, which is due to a special germ which has been determined by our Experiment Station.

The Chairman: How about this fruity flavor?

Prof. Dean: That is the result also of a germ or organism of cultures that have been isolated from cheese. It was sent from Montreal, from a bacteriological laboratory.

Mr. Luchsinger: I like a man who is patriotic, who believes in his country and in his people and in his profession either Canadian or American, and all Canadian cheesemakers are such enthusiastic believers in the cheese industry, that they be-

lieve that in the future it may come to pass as Prof. Dean has it, that the United States may become a customer for Canadian cheese, but when he suggested that that might come to pass, I thought I saw in this audience a firm determination that it never should, and I felt that we had in this audience just as enthusiastic believers in the future of Wisconsin cheese and American cheese as Prof. Dean has a belief in the future of Canadian cheese. This is a great country, Canada is a great country, the immensity of the United States and its possibilities for cheese production have only begun to be explored. Wisconsin, it is true, is taking the lead, because perhaps it has the best natural location for a dairy state of all the states in the North-West, but there are others, Minnesota, the Dakotas, all the Northern and Western states have like situations and like advantages with Wisconsin or with Canada. I have not the slightest idea, while I give credit to Prof. Dean for his belief and think all the more of him for being enthusiastic in favor of his own country, yet I have not the slightest idea that it will ever come to pass that the United States will ever become a customer to any great extent for Canadian cheese, good as it is, and may be superior, as some of it is. I am glad that he came here and spoke, and if his words have aroused ambition, and a sense that such things should never come to pass, he has done more good perhaps than by anything else he has said, and I am very glad that he has come here and made his remarks and made them as he has, and in the good nature, good sense and proper spirit that he has made them. (Applause.)

Mr. McKinnon called to the chair.

Mr. Michels: I would like to ask Prof. Dean one question. We tried to find out this forenoon what the percentages of fat were in cheese made from different milks, say, testing 3½ and milk testing 4 per cent., what are the differences in the per cent. of fat in the cheeses after they are made?

Prof. Dean: We have considerable data on that point, but I do not profess to be able to remember it all. If the gentleman will drop me a postal card at Guelph, I will be very glad to look it up, I cannot tell you now what would be the differ-

ence. We have found this general rule to be true, if there is an increase of percentage of fat in the milk, there is an increase of percentage of fat in the cheese, but just what the difference would be in the examples named, I would be unable to tell offhand.

Mr. Luchsinger: In this connection I want to state an interesting fact; in the production of Swiss cheese there is always a residue of butter fat remaining in the whey, more than in making any other kind of cheese. The reason for that is that the cheese is scalded at a higher temperature than any other kind of cheese that is made; it runs up to 120° to 130° F.. Now, it is the universal custom among Swiss cheesemakers to utilize that whey in the production of what is called whey butter; they do not let it go to waste, and many tons of it are made every year in Wisconsin and sold in the market at home and in large cities, and it is well made, it is a palatable article, not so good as creamery butter, but it is sweet, clean and sound, and has not a bad taste and is excellent for bakers' use and for cooking purposes. Now, it averages from one-half to three-quarters per cent. butter fat in the whey. I think if milk of 5 per cent. were used in the manufacture of Swiss cheese only, a certain proportion of that butter fat would be taken into the cheese, or would go into the cheese, and the rest of it would remain in the whey. I think that is where the difference comes in in the percentage of the milk in the different factories where they make Swiss cheese. I take it for granted that perhaps the so-called butter fats consist of not only one kind of fat, but more than one, that one kind is melted at a certain temperature, and that 130 degrees of temperature may cause one kind to flow off into the whey and the other kind to remain, and become part of the cheese. I cannot account for it in any other way. I know that, whatever kind of cheese is made at a low temperature, the less cream remains in the whey of the lower temperature; some of the kinds of cheese that are made have no amount of cream remaining in the whey; they may stand for a week and you would not find the least trace of cream rising to the top, but the Swiss cheese whey invariably contains

the percentage of butter fat that I have stated. Now, I state this simply in connection with this matter of whether 3½ per cent. or 4 per cent. milk would produce equally good cheese or not. My impression is in the matter of Swiss cheese, that a rich milk would simply cause the whey to become richer, a cheese would take up just so much butter fat and no more. Perhaps I am wrong in my theory, but the fact remains the same, that the whey contains that percentage of butter fat, and the richer the milk is, the more butter fat is in the whey.

Prof. Woll: I have refreshed my memory since this morning in regard to the richness of cheese made from the different kinds of milk. In answer to Mr. Michels' question, I can say that cheese made from normal milk will contain about 30 to 32 per cent. of fat. Now, if you add cream to the milk, or make the cheese from evry rich milk, the fat in the cheese may run up to 40 per cent., and if the milk is partially skimmed, the fat contents will run down below 30, down to 24 or less, so that we have a very wide range in the fat of cheese. The experiments that have been made show that with proper methods of manufacture there is no greater loss with rich milk than with poor milk to a degree up to about 5 per cent. of fat in milk. It is said too that with cheese made from rich milk, the per cent. of water is decreased, and that obtained from poor milk is higher. If milk is skimmed, the fat contents will be low, and the water contents will be much higher, and that experiments with cheese made from poor milk, say what our skim milk would be, the loss in curing is very much greater than with cheese made from rich milk.

Mr. DeLand: I would like to ask Prof. Woll if he ever examined any cheese that was put on the market that tested 40 per cent. butter fat? I have tested a great many cheeses and I never yet found any containing 40 per cent. of fat. The age of the cheese and the manner of curing has much to do with the per cent. of fat.

Prof. Woll: I have never personally analyzed such a cheese, but such analyses are on record.

Mr. Michels: I would like to ask Prof. Dean how he would

advise us to go ahead and instruct our patrons to take care of milk?

Prof. Dean: I should be very glad to answer that as done in Canada. I do not know your conditions here. We advise our patrons how we produce milk in the dairy school. We buy about 5,000 pounds of milk per day the year around. In the summer time we ask them to send us first in the spring of the year no colostrum milk, that is, no milk from cows which have had less than eight or nine or ten milkings since they dropped their calves. We had last spring considerable trouble of that kind. Second, we ask them to feed their cows on nothing but clean and wholesome food and in the spring of the year, if the cows are running in woods where there are bad weeds, we ask them to look particularly after that point, because often we get milk flavored with certain bitter kinds of weeds, and we ask them to feed no turnips, or turnip tops or rape or brewer's grain or anything of that kind. If we notice any milk of that kind, we simply send it home, we will not take any milk of turnipy flavor. Then we ask them to send us milk only from healthy cows. If a cow is sick from any cause whatever, we ask them not to send her milk to us, and in hot weather we ask them to cool the milk to a temperature of 60 degrees, if possible, at least below 70, as soon as possible after milking, not aerate it; as I understand aerating, it is customary to force air into the milk, that is what I understand by aerating. Now, milk will have to be stirred in order to cool it rapidly, but I do not understand that to be aerating, I understand that to be cooling of the milk. I make that distinction.

Mr. Michels: Do you advise covering up the can after it is cooled?

Prof. Dean: We recommend putting two sheets of thin cotton over the can, so as to keep out the dust. I would not put a lid over the can, but I cover with cotton.

Mr. Michels: You would not recommend any kind of an aerator to pass air through the milk while it is being strained?

Prof. Dean: No, sir, I do not think there is any value in that. Now, that is based on the assumption that the oxygen

of the air purifies the milk, and I think that has yet to be proven. In a majority of cases the air of a farm is laden with impurities and bacteria which grow in the milk rapidly at a high temperature. Now, in hot weather you cannot cool the milk cooler than the surrounding atmosphere, and if the temperature is 90, you cannot cool it below that, and that is the temperature in which the organisms which produce bad flavors grow most rapidly, and unless we get the milk below 70 we are making conditions that will favor the growth of these organisms. That is why we recommend the cooling.

Mr. Helm: I would like to ask what effect freezing has on milk.

Prof. Dean: Where the milk is frozen, I think in butter making it tends to make the butter perhaps not quite so good in quality, the texture is not so good, although we have not noticed any bad effect from it, and in cheese making the chief trouble I think is in the excessive loss of fat, and the texture of the cheese will probably not be quite so nice.

Mr. De Land: I would like to ask the Professor why, after you have cooled the milk below the temperature of the air, that is done by putting it in water and stirring it, why, after cooling it below the temperature of the air it is not better to close that can tight and keep the air from coming in contact, for the reason that you say, if we aerated it we get these germs and bacteria and hence should not aerate; now, is it not a fact that milk as it is taken from the udder of the cow is in the purest and best state and contains the most nutrition for the support of life of any condition it might ever be in again, is not that true?

Prof. Dean: In answer to the first question I would say that I do not know if there would be any particular objection to covering it, although I think that the cotton would act as a filter, preventing any germs or organisms that might be in the air getting into the milk, although I do not know that there would be any particular objection after you get it cooled down to 60 to put the lid on to the can, but the cotton would be all right, and possibly in a great many cases, it would be better

than putting the can lid on. In answer to the second question, it has been found recently that there may be bad germs or organisms come into the milk from the cow's udder; while it has been supposed that no germs of any kind could possibly be in the milk as it came from the cow's udder, that theory has been to some extent disputed, although, take it in the great majority of cases, undoubtedly the milk does contain the highest amount of nutriment when it is first drawn from the cow's udder.

The following announcement of the report of the Judges on Cheese was made:

Mr. Chairman, Gentlemen of the Convention:

As Chairman of the Committee on Cheese Judging I will say that in our work we had a critic who followed us and made notes which, no doubt, you will all hear of later. The cheese scores are as follows:

American Cheese.

No. of entry.	Name of Exhibitor.	Post Office.	State.	Flavor. 45	Texture. 30	Color. 15	Make-up 10	Total. 100
1	Jos. A. Roemer	Fond du Lac	Wis	41	26	13	9	89
2	John Clarson	Boscobel	Wis	43	29	14	8	94
3	J. A. Schaefer	Prairie Farm	Wis	44	29	14	9	96
4	H. B Stanz	Milwaukee	Wis	37	20	10	8	75
5	O. A. Kielsmeier	Hika	Wis	45	28½	13	7½	92
6	E. Siggelhau	Hika	Wis	41	28	13	7½	89½
7	H. Anderson	Sheboygan Falls	Wis	41	27	13	8½	89½
8	J. K. Biddulph	Providence	Ill	44	28½	14	8½	95
9	F A. Viergutz	Chippewa Falls	Wis	44½	30	15	9½	99
10	P. H. Kasper	Clintonville Falls	Wis	44	28	13	9	96
11	Arthur Roycraft	Chippewa Falls	Wis	41	27	14	9	91
12	John Hoeppner	Marion	Wis	44	28	14	8½	94½
13	Matth'w DeHaan	Lineville	Iowa	40	26	12	9	87½
14	Hugh Nisbet	Madison	Wis	40	28	7½	9	84½
15	Chas. Pickard	Muscoda	Wis	44	28½	14	8½	95
16	B. G. Schafer	Darlington	Wis	41	28	14	8	91
17	Matth'w DeHaan	Lineville	Iowa	42	27	12	7	88
18	Edgar Lepley	West Lima	Wis	44	29	14	10	97
19	J. F. Bachmann	Black Creek	Wis	42	28	13½	5	88½
20	John Griffin	Boaz	Wis	42	2 ½	13	9	92½
21	C. F. Krueger	Black Creek	Wis	41	23½	13	9	86½
22	Jos. Jasper	Garnet	Wis	40	26	10	8½	84½
23	Chas. Gartmann	Sheboygan	Wis	42	29	14½	7½	93
24	Ernst C. Boll	Erdman	Wis	40	25	13	7½	85½
25	H. C. Alves	Sheboygan Falls	Wis	42	29	13½	9½	94
26	Chas. Fischer	Hortonville	Wis	41½	28½	13½	10	93½
27	W. S. Walsh	Orihula	Wis	42	28	14	9	93
28	H. H. Graskamp	Van Dyne	Wis	40	25	13	9	87
29	M. McKinnon	Sheboygan Falls	Wis	43½	29½	13½	10	96½

Brick Cheese.

No. of Entry	Name of exhibitor.	Post Office.	State.	Flav 40	Text 30	Color. 15	Make up. 15	Total. 100
1	Alex Schaller....	Mt Horeb	Wis ..	36	30	15	15	96
2	Jac. Rothenback	Ackerville	Wis ..	34	30½	15	15	94½
3	Fred Hosely.....	La Crosse.....	Wis ..	34	27	14	15	90
4	Fred Andreg.....	La Crosse.....	Wis ..	33	29	15	13	93
5	Geo. Hoefler.....	Griffin.....	Wis ..	36	25	15	12	91
6	Max P.E. Radloff	Hustisford.....	Wis .	40	30	15	12	97
7	R. C. Ganschow.	Bonduel.	Wis ..	39	28	15	12	94
8	Jac. Frechter....	Monroe.....	Wis ..	39	29	15	11½	94½
9	E Regetz.....	Blanchardville ..	Wis ..	38	29	15	13	95
10	Jonely Bros.....	Brownsville.....	Wis ..	40	29	15	14	98
11	Unknown	.....	.....	35	29	14	13	92

Swiss Cheese.

No. of entry.	Name of Exhibitor.	Post Office.	State	Flavor. 30	Holes. 25	Texture. 20	Color. 10	Salt. 10	Style. 5	Total. 100
1	Jac. Marty.....	Brodhead.....	Wis...	27	25	18	10	8	5	93
2	H. B. Stanz.....	Milwaukee.....	Wis ..	27	24	18	10	8	5	92
3	Alex Shaller	Mt. Horeb	Wis ..	29	21	19	10	10	5	94

Limburger Cheese.

No. of entry.	Name of Exhibitor.	Post Office.	State.	Flavor. 40	Texture. 30	Color. 15	Make up. 15	Total. 100
1	Alex Schaller....	Mt. Horeb'.....	Wis...	36	28	15	13	92

F. A. Viergutz, Chippewa Falls, Wis., won first premium, gold medal, on Cheddar cheese.

Jonely Bros., Brownsville, Wis., won first premium, gold medal, on brick cheese.

Alex. Schaller., Mt. Horeb, Wis., won first premium, gold medal, on Swiss cheese.

Edgar Lepley, West Lima, Wis., won second premium, silver medal, on Cheddar cheese.

Max. P. E. Radloff, Hustisford, Wis., won second premium, silver medal, on brick cheese.

Jacob Marty, Brodhead, Wis., won second premium, silver medal, on Swiss cheese.

M. McKinnon, Sheboygan Falls, Wis., won third premium, bronze medal, on Cheddar cheese.

Alex. Schaller, Mt. Horeb, Wis., won third premium, bronze medal, on brick cheese.

H. B. Stanz, Milwaukee, Wis., won third premium, bronze medal, on Swiss cheese.

The $100.00 cash premium fund will be awarded on the excess pro-rata plan to all entries scoring above 90 points.

Every exhibitor whose cheese scores above 90 points, will receive a diploma signed by the judges and verified by the President and Secretary, setting forth the score of the cheese, the highest score, the lowest score, and the average score of all cheese exhibited at the meeting.

Instructor E. L. Aderhold will write you from the data and notes he secured from following up the Judges in their work.

Respectfully submitted,
John Kirpatrick, Chicago, Ill.,
I. F. Laing, Chicago, Ill.,
John Luchsinger, Monroe, Wis.,
Judges.
J. W. Cross, Mauston, Wis.,
Superintendent.
E. L. Aderhold, Neenah, Wis.,
Critic.

Mr. Luchsinger: I would like to say right here that the exhibit of brick cheese was the largest and the finest that I have ever seen in any exhibition, and it seems to me that the brick cheese industry, judging by the exhibit to-day, seems to have a great future before it in Wisconsin. There is no doubt but what the use of it and the consumption and sale of it will increase manifold within the next few years. There is no doubt at all that Wisconsin, or at least portions of it, are peculiarly fitted for the production of the finest quality of brick cheese, and special pains seem to have been taken by these exhibitors to bring a good quality of cheese here. The fact of the matter is, in the twelve exhibits there are only but few points of difference, and the committee was many times puzzled to judge which was entitled to one point or a half point than another.

The President resumes the chair.

The Chairman: I wish to state that the gentleman to whom the first premium was awarded is absent, owing to the sickness of his wife. At a meeting of the directors last night, they concluded, and I think very justly too, under the circumstances, to deviate from the rules. You know that according to our rules, no exhibitor is entitled to a premium unless he presents himself here in person at our meeting, but under the circumstances I think that every member of the Association will agree with the conclusions arrived at by the board of directors in awarding the first premium to Mr. F. A. Viergutz. I am sorry this gentleman cannot be with us, because he has the reputation of being a first class cheesemaker and I am very glad to know that he was awarded the prize he was so distinctly entitled to.

The Chairman then called on Mr. Alex. Schaller, to whom first premium on Swiss cheese had been awarded, to tell the convention his method of making cheese.

Mr. Schaller: I cannot speak good English, but I will tell you as well as I can how I made that Swiss cheese. That cheese was made from fresh milk on the 25th of August. I warmed up the milk to 94 Fah. to set the milk and then it takes generally about half an hour before we begin to work it. Then

I take a shovel and push the curd over and over for about twenty minutes. Then I start the curd agitators, put them in, and stir for about two hours with the engine and I warm the curd to 130° F., after which I take the cheese curd out. I turn the cheese over three or four times during the afternoon and evening on the press. The next morning, the first thing when I come up to the factory I turn them over again, say about three or four times during the next day, then I put them in the salt and from there in the cellar. That is about all I know about Swiss cheese making.

Mr. Luchsinger: Do you take your cheese out in one piece?

Mr. Schaller: In one lump out of the kettle, yes.

Mr. Luchsinger: Now, will you tell the meeting at what temperature your cellar is at the time of salting, and how you salt it, how long you salt it and what the temperature in the cellar is when you are in the last stage of curing.

Mr. Schaller: In the last days of curing, I generally keep the temperature at about 65 to 70 degrees Fah.; about 60 when I am salting. I have only one stone cellar wall between the boards. I salt in a tank; I put about a barrel or a barrel and a half or two barrels of salt in with the water, so that the water is strong enough the float the cheese up, so that the cheese does not sink, and there I leave them for about four days.

Mr. Luchsinger: That is, when you first take it out of the press?

Mr. Schaller: Yes. I leave the cheese in the salt water about three or four days and then I take them out of the salt water and put them on dry boards and let them dry good before placing on curing boards. Then I start to dry salt them. Just take them out onto the table, turn them over and put salt on the top, so I work them every other day as long as I keep the cheese. Sometimes we have got to keep it over two months, and some times not over six weeks, but have got to salt them all the time, every other day.

Mr. Marty: I would like to ask Mr. Schaller whether the rennet used for Swiss cheese is home made rennet, or commercial rennet extract.

Mr. Schaller: It is a home made rennet.

Mr. Luchsinger: That is, you use the actual rennets and soak them and make your own extract that way.

Mr. Schaller: Yes, I soak them, take half water and half whey, soak them in that, leave them stand about a day and a half.

Mr. Luchsinger: Now, how do you account for the fact that some of this Swiss cheese has what they call perfect holes and others have not, what is the reason? Give the reasons if you can, and why others are almost solid, just give the conditions under which each one of those conditions arise.

Mr. Schaller: I do not really know what you mean.

Mr. Luchsinger: How does it happen that all the Swiss cheeses that are made are not alike in size and appearance and quality of holes?

Mr. Schaller: It depends on the milk. From good milk we generally have good cheese if the cheesemaker is a good man and understands his business.

Mr. Marty: I would like to ask Mr. Schaller in regard to good milk, what he means by good milk, whether the ripeness of the milk has anything to do in Swiss cheese or not. We do not figure on ripeness of milk in Swiss cheesemaking and I would like to ask Mr. Schaller whether the ripeness of milk has anything to do in regard to the formation of the holes in Swiss cheese.

Mr. Schaller: I would like to ask that question myself. Mr. Marty do you know. Mr. Marty is an instructor in Swiss and Brick cheese, and I would like to ask him. He knows more about it than I do.

Mr. Marty: In regard to that point, we have no particular guide to go by in Swiss cheese making but I think in the near future our cheese will be made with regard to the ripeness of the milk. The fact that the best or sweetest milk that we receive in the season is generally the cause of No. 2 cheese in Swiss cheese, what we term a glassler cheese, leads me to believe that such milk is not of sufficient acid to produce the proper fermentation necessary to produce the eyes or holes in

the Swiss cheese. I think this point should be taken up by the authorities of the dairy school to get at that point. I think we should have a certain degree of ripeness in the milk in the fall of the year so we can work a curd accordingly, as we do in the summertime, in midsummer.

A Member: I would like to ask Mr. Schaller if he used sour whey or any kind of starter to make his cheese?

Mr. Schaller: Yes, I take the whey, half whey and half water, and then I leave that stand for awhile, a day and a half, and I guess that is what the starter is, the whey, as you call it. I have made block cheese from commercial rennet extract, and I could not get any holes in it, and I put that rennet extract in water, but I did not get any eyes in the cheese; I had about six boxes of it, the first time I took whey, put the rennet extract in, that cheese got holes, and so I think if we had a starter with rennet extract and we put water with it, we will get good Swiss cheese.

Mr. Luchsinger: That is, you mean, Mr. Schaller, that you take half whey and half water to your rennet while you are making your extract, that is what you mean?

Mr. Schaller: Yes.

Mr. Luchsinger: And you regard the extract that you get that way as a sort of starter?

Mr. Schaller: Yes.

Mr. Luchsinger: You will find on exhibition at the exhibition room a cheese that is perfect in holes or eyes, absolutely perfect, could not be improved. If it were going to be cut open, cheese makers would say it is a perfect cheese, as far as the eyes are concerned. We had some other things that were not in the score quite so high, and therefore did not succeed in getting the first premium, but as to the eyes, I do not know of any cheese I ever saw imported or made in this country that excelled that.

The President then introduced to the convention Mr. R. Sanford, of Portland, Ore., who extended an invitation to the Oregon Centennial Exhibition in 1905.

SECOND DAY'S SESSION.

Thursday Evening, January 8, 1903.

BUSINESS SESSION.

The convention met pursuant to adjourment at 7:30 P. M. President Dickson in the chair.

The President: We will now receive the report of the Secretary.

REPORT OF SECRETARY.

U. S. Baer, Madison, Wis.

Mr. President and Members of the Association:

I have the honor to report upon the work of this office for the year ending January 7th, 1903.

In spite of the fact that our finances have been limited to that extent that your officers work has been hampered, because of insufficient available funds to properly carry out the work, yet this association has had its full share in all the progress made in the cheese industry of the state during the past year. The association has barely sufficient funds to cover expenses incurred, and its officers are not disposed, in addition to the large amount of personal labor devolving upon them in promoting the interests of the association, to incur pecuniary liabilities beyond the amount of funds provided. Their time and energy have been given gratuitously, and will be as long as funds are provided for the work.

In briefly reviewing the work accomplished during the past year and noting the unfinished business that should have been carried to completion, it is quite apparent that the present annual state appropriation of $400.00 should be increased to that

of not less than $1,500.00 per year. With these facts before us Treasurer McCready has, for our consideration, compiled from his itemized accounts of the receipts and expenditures, a condensed financial statement for the association year just ended. This statement will show the sources from which all moneys paid into the treasurer's hands were received and disbursements paid on orders received from this office which he holds as vouchers. The books of the Treasurer and Secretary are open for inspection at any time by any member of the association. This organization is representative of the largest single farming industry of the state and should receive state aid in proportion to the extent of the wealth of the industry which this body is fostering.

Last evening I overheard a prominent member of this organization state, in conversation, that he favored cutting down the state publication of the proceedings of this association to half of its present edition, which is 3,000 copies in paper and 1,000 copies in cloth binding. I sincerely hope that this opinion will not meet with favor, for the present 4,000 edition of the report is not in excess of the demand. Less than 100 copies of the reports for the years 1899–1900 and 1901 are now available for distribution and less than 300 copies of the 1902 report is at present in my hands.

Calls are continually coming from many institutions of learning and various public libraries throughout the country for complete sets of these reports Proprietors and managers of cheese factories requested several hundred copies for distribution among their patrons. Our annual reports are meeting with favor, because of the many practical discussions which they contain upon the more important points of cheese making.

Mr. Wilmer Seig, Ex-President of the Citizens Business League of Milwaukee and a prominent businss man of this city has said the following with reference to these reports:

"The importance of the meetings of the Wisconsin Cheesemakers' Association is proved by the excellent report issued by them each year. This report is worth a vast sum to the dairy interests of the state, as every paper read and every dis-

cussion engaged in tends toward the advancement of the cheese industry, and in their compiled form, the cheesemakers of the state have an abundant chance to read, re-read and profit by them."

Realizing the importance of our cheese industry, we should not hesitate at grasping at the opportunity to make the Wisconsin cheese exhibit a prominent feature of the St. Louis exhibition. This is the place to discuss ways and means for making permanent arrangements for a commendable exhibit of Wisconsin cheese at the 1904 exposition. I believe that this work pre-eminently falls within the province of ths organization.

The first step is to appoint a committee before the close of this convention. If this is not done—if the appointments are left to the last minute and the preliminary arrangements are left in the hands of men not thoroughly interested and posted on dairy matters, the result will be as it was at Chicago in 1893 and Buffalo in 1901.

This report having been the first of three called for, I have attempted to make it, in a measure, explanatory to the reports of the Treasurer and of the Board of Directors, which are to follow.

Thanking you for the many courtesies extended to me during the past year, I am yours to serve.

A motion that the report be accepted and embodied in the annual report was carried.

The rport of the Board of Directors was submitted as follows:

REPORT OF THE BOARD OF DIRECTORS.

J. K. Powell, Chairman.

Gentlemen:—

A meeting of the directors and officers of the Wisconsin Cheesemakers' Association was held at the Republican Hotel in the city of Milwaukee on the 12th day of September, 1902. Present—Directors: Fritz Karlen and Thomas Johnston; Offi-

cers: President, W. C. Dickson; Vice President, M. McKinnon; Treasurer, John McCready; Secretary, U. S. Baer.

The following resolutions were unanimously adopted:

Resolved, That the many invitations extended through the year by the Citizens' Business League of Milwaukee, Wisconsin, to hold the next meeting of the association in the metropolis of the state be accepted; and that the time of the eleventh annual convention be set for January 7, 8, and 9, 1903.

Resolved, That gold, silver, and bronze medals be awarded as first, second and third premiums for cheese in each class, and all cheese scoring over 90 points be awarded a diploma.

Resolved, That owing to the insufficient funds now in the treasurer's hands to meet the preliminary expenses of the next meeting, that local speakers from the state be required to bear their own expenses in attending the meeting.

Resolved, That all money over $100 contributed to the pro rata fund be retained in the general fund.

Director Thomas Johnston was instructed to solicit the cooperation of the supply, cheese and transportation men and to collect their cash contributions to the pro rata fund.

Secretary U. S. Baer was instructed to secure suitable medals and badges; also to arrange for transportation, hotel headquarters, convention hall and exhibition rooms.

We have examined the accounts and vouchers of the secretary and find them correct.

(Signed) J. K. Powell,
Thos. Johnston,
F. J. Karlen.

TREASURER'S FINANCIAL REPORT FOR 1902.

Mr. President and Members of the Association:—

The following itemized report is made, showing the source from which all moneys paid into the Treasurer's hands were received, and the disbursements paid on order from the Secretary, which I hold as vouchers:

Receipts.

1902.		
Jan. 9	Balance in hands of treasurer	$147 66
Jan. 10	Memberships	225 00
Jan. 28	From state treasurer	400 00
Nov. 25	Muscoda Dairy Board of Trade	10 00
Dec. 4.	Diamond Crystal Salt Co., St. Clair, Mich.	10 00
Dec. 5	E. A. Roser & Co., Chicago, Ill.	10 00
Dec. 5	A. H. Barber & Co., Chicago, Ill.	10 00
Dec. 5	P. H. Bolten & Co., Chicago, Ill.	2 00
Dec. 5	E. J. Piggott & Co., Chicago, Ill.	5 00
Dec. 5	Creamery Package M'f'g Co., Chicago, Ill.	25 00
Dec. 5	Crosby & Meyers Co., Chicago, Ill.	5 00
Dec. 5	The Sharple's Separator Co., Chicago, Ill.	10 00
Dec. 5	Sturger & Burn Co., Chicago, Ill.	10 00
Dec. 5	A. Grossenbach & Co., Milwaukee, Wis.	10 00
Dec. 5	Wisconsin Dairy Supply Co., Whitewater, Wis.	15 00
Dec. 5	Republican Hotel, Milwaukee, Wis.	10 00
Dec. 8	Francis D. Moulton & Co., Chicago, Ill.	5 00
Dec. 10	Wells Richardson Butter Color Co., Burlington, Vt.	10 00
Dec. 10	Worcester Salt Co., New York, N. Y.	10 00
Dec. 12	Sheboygan Falls Dairy Board of Trade	36 20
Dec. 12	Genesee Salt Co., New York, N. Y.	10 00
Dec. 15	C. E. Udell & Co., Chicago, Ill.	10 00
Dec. 15	Cornish, Curtis & Green M'f'g Co., Ft. Atkinson, Wis.	10 00
Dec. 16	Hortonville Dairy Board of Trade	9 00
Dec. 16	David Muir & White, Fond du Lac, Wis.	25 00
Dec. 16	A. H. Barber M'f'g. Co., Chicago, Ill.	10 00
	Total receipts	$1,039 86

Disbursements.

1902.		
Jan. 9	L. E. Knickerbocker, expense attending convention	$6 96
Jan. 9	J. K. Powell, expenses attending convention	15 09
Jan. 9	J. K. Powell, expenses attending executive meeting	11 67
Jan. 10	J. B. McCready, expenses attending convention	3 36
Jan. 10	Telegrams	4 25
Jan. 10	Drayage, freight on cheese	4 55
Jan. 10	Secretary's salary	25 00
Jan. 10	U. S. Baer, expenses 2 trips to Milwaukee	12 06
Jan. 10	Express on cheese and program cuts	1 35
Jan. 10	Walter Mayer, printing 1,300 programs	54 00
Jan. 11	Hotel bills of speakers at convention	92 53
Jan. 11	Archibald Smith, lecture and expenses	50 00
Jan. 11	Complimentary memberships	2 00
Jan. 13	U. S. Baer, secretary, postage	64
Jan. 14	Whitehead Hoag Co., badges	27 88
Jan. 15	U. S. Baer, secretary, postage	1 80
Jan. 15	Dr. H. L. Russell, expenses attending convention	3 50
Jan. 15	Express on reports	1 40
Jan. 15	Two telegrams	70
Jan. 20	Postage on reports	80
Jan. 22	Postage on letters	44
Jan. 25	U. S. Baer, traveling expenses to Muscoda	3 74
Jan. 25	Pro-rata premium to Walter Fero	3 64
Jan. 28	Pro rata premiums	140 56
Jan. 28	F. J. Karlen, expenses attending convention	12 00
Jan. 28	Walter Mayer, printing	12 00
Jan. 28	Wm. Waterstreet, expenses attending convention	9 00
Jan. 28	E. L. Aderhold, expenses attending convention	9 50
Jan. 28	F. J. Forward, expenses attending convention	6 10
Jan. 28	A. J. Glover, expenses attending convention	7 87
Jan. 28	J. R. Biddulph, expenses attending convention	15 64
Jan. 29	F. N. Sargent, expenses attending convention	7 75
Jan. 29	Drafts, express and postage	3 04
Jan. 30	Ida Johnston, typewriting	16 00
Jan. 30	U. S. Baer, secretary, postage	92
Jan. 31	J. W. Cross, expenses attending convention	12 13
Jan. 31	Drayage, express and freight, cheese exhibit	10 00
Feb. 9	Mrs. A. L. Kelly, reporting meeting	105 60
Feb. 17	John Luchsinger, expenses attending convention	8 20
Feb. 17	Averbeck Jewelry Co., seven medals	45 00
Mar. 4	Averbeck Jewelry Co., thirty-two medals	64 00

Mar. 8	Averbeck Jewelry Co., two medals	4 00
Mar. 8	U. S. Baer, secretary, postage	1 40
Mar. 9	Express, postage, reports and letters	1 99
Mar. 9	Postage on medals	1 02
Mar. 10	Postage on diplomas	1 26
Mar. 14	Effie Close, typewriting	1 00
Mar. 28	Averbeck Jewelry Co., two medals	4 00
Mar. 28	U. S. Baer, secretary, postage	32
Apr. 11	U. S. Baer, secretary, postage	48
May 15	Postage on reports	32
June 10	Postage on three pieces proof	30
June 17	Express on electrotype	25
June 18	Pen drawing, zinc etching	4 61
July 1	Interest on borrowed money	2 15
July 8	U. S. Baer, secretary, postage	1 10
July 25	Walter Mayer, printing	2 50
Aug. 8	Henry Zinck, drayage, 4,000 reports	2 50
Sept. 2	Postage and express on reports	3 20
Sept. 23	U. S. Baer, secretary, postage	4 08
Sept. 23	Interest on borrowed money	1 20
Oct. 11	Boxing, freight, express and postage on reports	50 14
Oct. 16	Anna Moore, typewriting	1 40
Oct. 29	Express, freight and postage on reports	18 40
Oct. 30	U. S. Baer, secretary, postage	2 80
Nov. 3	Wrapping paper, twine, 500 envelopes	3 00
Nov. 20	Postage and express	3 75
Nov. 29	Boxing, freight and express on reports	5 55
Dec. 6	U. S. Baer, expenses, trip to Milwaukee	6 25
Dec. 10	U. S. Baer, secretary, postage	2 10
Dec. 12	Telegrams	1 00
Dec. 22	Postage on programs	13 50
Dec. 26	Western Passenger Association, special agent	11 10
Dec. 28	Effie Close, typewriting	7 00
Dec. 30	U. S. Baer, secretary, postage	1 00
	Total disbursements	$978 34
	Balance in hands of treasurer	61 52
		$1,039 86

On September 1st this office had no available funds to cover expenses incurred. This condition of finances was brought about through the liberality of this association in granting a large cash premium fund, including medals and diplomas to

those exhibiting cheese in the educational contest. In order to insure the prompt distribution of the annual report, at the suggestion of the Board of Directors, this office secured a loan of $170 to meet the necessary expenses.

Deducting the balance of $61.52 at present in the treasury, places this association's indebtedness at this date at $108.48.

Respectfully submitted,

JOHN B. MCCREADY,
Treasurer.

The President: I would just state that the Treasurer's report was submitted to the Executive committee, and by them approved.

Mr. McCready: Mr. Baer and I are responsible for two notes—one is for $100 and one for $70 that we have had to give in order to carry on the work. Mr. Baer and myself are responsible for those two notes, and of course as officers of the association, we will be responsible for the whole association. Now, we do not feel that we can afford to hand that over, yet we do think that if each member here who has exhibited cheese woulld be kind enought to do just as the buttermakers have done: give thirty pounds of cheese to this association and let us sell that and get the money for that, I think we can raise those two notes. That is only a suggestion, and it should not be from an officer of the association; I do not feel like making t, but I have made it. Each member who has exhibited cheese surely feels that he is interested enough in the association to give at least thirty pounds of chees to this association which has gone so far to uphold the dignity of his profession.

Mr. Knickerbocker stated that in his opinion those who had exhibited cheese ought not to stand all the expense, but it should be distributed equally among the members.

It was moved by Mr. Davis that this matter be brought up again the next morning before a full meeting for further action. (Carried.)

REPORT OF THE COMMITTEE ON RESOLUTIONS.

Milwaukee, Wis., January 8, 1903.

The Wisconsin State Cheese Makers' Association:

Your committee on Resolutions would respectfully submit the following:

Whereas, There is pending in both houses of congress, a bill to enlarge the jurisdiction and powers of the Inter-State Commerce Commission, known as the Revised Elkins bill, S. 3521, in the senate, and the new Wanger bill, H. R. 15592, in the house, upon which full hearings have been held before the proper committees of the respective houses, which is intended to restore to the Inter-State Commerce Commission the powers which it formerly exercised until denied by the decisions of the federal courts,

Be it resolved, By the Wisconsin Cheese Makers' Association, in convention assembled in Milwaukee, January 8th, 1903, that the senators and representatives from the state of Wisconsin be, and are hereby respectfully requested to exert their utmost influence to secure the enactment of the said measure into law during the present session of Congress.

Rsolved, That a copy of the foregoing preamble and resolutions be forwarded to each of the senators and representatives in congress from the state of Wisconsin, and also the chairman of the Inter-State Commerce committee of the senate, and the Inter-State and Foreign committee of the house of representatives.

Whereas, It has been shown in tables of rates of freight published at different times during the past two months in the Milwaukee Free Press, the correctness of which has not been questioned, that the rates charged for the transportation of property of various kinds in the state of Wisconsin range from 30 to 60 per cent. higher than is charged for a similar service in the adjoining states of Illinois and Iowa,

Whereas, The rate of freight charged for the transportation

of cheese from producing sections of the state to consumptive points within the state are proportionately excessive and unnaturally higher than the rate charged on other food product, therefore

Resolved, By the Wisconsin State Cheese Makers' Association, in convention assembled in Milwaukee, January 8, 1903, that the legislature of this state be, and is hereby respectfully petitioned to enact at its coming session, a bill providing for the creation of a board of railroad commissioners of not less than three (3) members, with power to prescribe maximum rates of freight to be charged by the several railroad companies doing business in this state and to correct abuses arising in the transportation service.

Resolved, That we respectfully request the legislature at its coming session to increase our annual appropriation from four hundred dollars to sixteen hundred dollars, for the purpose of meeting the expenses of our annual conventions, of distributing their publications and of making educational exhibits.

Resolved, That a copy of these resolutions be forwarded by the Secretary of this association to the President of the senate, Speaker of the assembly, and to each of the members of the legislature of this state. Further

Resolved, That the members of this association be requested to communicate with the members of the legislature for their respective districts, requesting them to use their best efforts to secure the enactment of such legislation at the coming session of the Wisconsin legislature. And that each and every member of this association be requested to agitate the subject with their respective patrons.

Whereas, The Wisconsin State Cheese Makers' Association, in convention assembled at Milwaukee, Wisconsin, January 8th, 1903, realizing the vital importance to the state of Wisconsin of a creditable exhibit of her resources, and especially of her great dairy interests, at the St. Louis World's Fair, 1904, and in view of the large appropriations made by the legislatures of our neghboring states, do most earnestly urge the legislature of Wisconsin to increase the present appropriation to such an

amount as will enable Wisconsin to take the advanced position she should assume among her sister states;

Resolved, That it is the sense of this convention that it will be for the best interests of the Wisconsin cheese industries to have a competent person appointed to especially look after and take charge of the Wisconsin cheese exhibit at the St. Louis World's Fair, 1904, and that we hereby do most respectfully request that the Board of Wisconsin Commissioners appoint such official.

Resolved, That the Secretary of this association is requested to send a copy of this resolution to the Secretary of the Board of Wisconsin Commissioners.

We, your committee, believe that a large portion of the poor cheese of Wisconsin is made by inexperienced makers, therefore, be it

Resolved, That we petition the legislature to enact a law licensing cheesemakers, and allowing only those that have had two (2) or more years' experience as helpers to make cheese.

Resolved, That we most heartily endorse the remarks made before this association by Dairy and Food Commissioner Emery as to the needs of an assistant chemist, and an increase in the number of inspectors for the proper enforcement of dairy and food laws of the state. And we urgently request the legislature to make provision for this much needed increase to the working force of the Dairy and Food Commissioner's office.

We believe if the cheesemakers of Wisconsin would carefully follow out the advice in the making and curing of cheese as set forth in the able addresses of Professor H. H. Dean and T. B. Millar of Canada, it would result in a higher standard of quality in our Wisconsin make.

Be it Resolved, That we extend to them a vote of thanks for their courtesy in adding so materially to the interest and pleasure of our meeting.

Resolved, That we heartily endorse the appointment of Mr. E. Sudendorf for Superintendent of the Dairy Department at at the St. Louis World's Fair, 1904, and that the Secretary send

a copy of this resolution to the president of the St. Louis World's Fair.

Resolved, That we extend to President W. C. Dixon and Secretary Baer, and all officers of the association, a vote of thanks for their efficient work during the past years, which has resulted in making this association the most progressive of its kind in the United States.

Resolved, That we extend to the Press of Milwaukee, our thanks for so fully reporting the proceedings of our meeting, and for all other courtesies shown us. Also to the citizens of Milwaukee, and:—

Especially to the Citizens' Business League and the Merchants and Manufacturers' Association who have helped to make this, our Eleventh Annual Convention, a decided success.

All of the above is respectfully submitted by your Committee.

H. G. Davis, Chairman,
R. C. Green,
J. F. Bachmann,
Committee.

The report of the Committee on Resolutions was adopted by the association as read.

ELECTION OF OFFICERS.

The first business under this heading was the election of a director to take the place of Mr. Thomas Johnston.

The President called for nominations; Mr. Johnston stated that he was not a candidate for re-election, having held the office for four years.

The President appointed as tellers Mr. Hugh Nesbit, Mr. Fred Marty and Mr. R. P. Dassow.

Mr. Bachman nominated Mr. Wallace, seconded by Mr. Aderhold.

Mr. Dassow nominated Mr. Aderhold, seconded by Mr. McCready.

Mr. Davis nominated Mr. Alves, duly seconded.

The tellers announced that the ballot resulted as follows:

Alves, 9; Wallace, 9; Aderhold, 32.

Mr. Aderhold, having received a majority of the votes cast, was declared duly elected.

Nominations for President were next in order and the following nominations were made:

Mr. Michels was nominated; seconded by Mr. Baer.

Mr. McCready was nominated by Mr. Dassow; duly seconded.

Mr. Johnston was nominated by Mr. Knickerbocker, seconded by the Chair and others.

The tellers announced the result of the ballot as follows:

Michels, 6; McCready, 17; Johnston, 31.

Mr. Johnston was declared the duly elected President and thanked the Association as follows:

Mr. Johnston: Mr. Chairman and Gentlemen of the Convention: I am sure this is very much of a surprise to me, because it is something that I did not expect, and I want to thank you for the many honors you have conferred upon me. I might say I have been an officer ever since this convention was organized, and I think one man should not occupy an office all the time; however, I will try to do the best I can for you, and I am afraid I will not be able to fill the office as well as my predecessor, Mr. Dickson, has done, but I will do the best I can, and I thank you very kindly.

Mr. Johnston then took the chair.

Nominations for Vice-President were next called for.

Mr. Green was nominated by Mr. Kirkpatrick, duly seconded.

Mr. Green stated that he was already a director of the Butter Makers' Association and could not possibly accept another office.

Mr. Reed was nominated, seconded by Mr. Dickson.

Mr. McKinnon was nominated by Mr. Dassow, duly seconded.

Mr. Waterstreet was nominated by Mr. Davis, duly seconded.

Mr. Mason was nominated, duly seconded.

Mr. Nesbit was nominated by Mr. Aderhold, duly seconded.

Mr. McKinnon requested that his name be not used, as he did not desire re-election.

A ballot was then taken, and the result announced as follows:

Waterstreet, 8; McKinnon, 5; Green, 1; Reed, 12; Nesbit, 20; Mason, 6.

There being no choice, another ballot was taken with the following results:

Nesbit, 43; Mason, 7; Waterstreet, 4.

Mr. Nesbit was declared elected.

Nominations for Secretary were then called for.

Mr. Baer was nominated by Mr. Waterstreet, duly seconded.

It was moved by Mr. Davis that the Chair cast the unanimous vote of the convention for Mr. Baer, which motion was carried, and Mr. Baer declared duly elected.

Nominations for Treasurer were then called for. Mr. Waterstreet nominated Mr. McCready, which nomination was duly seconded, and on motion of Mr. Davis the Secretary was instructed to cast the unanimous vote of the Association for Mr. McCready, who was thereupon declared duly elected.

The Convention adjourned to meet at 10 o'clock next day.

THIRD DAY'S SESSION.

Friday, January 9, 1903.

The President in the Chair.

WOMEN AS CHEESE FACTORY MANAGERS AND CHEESE MAKERS.

Miss M. A. Raeder, Milladore, Wis.

There are various occupations that are healthful, naturally adapted and profitable that women are filling with credit to themselves and with honor to their calling. The ambition to better one's financial condition is not wholly confined to those of the more muscular strength of the human family. It is a distinguished feature permanently existing in the American people, regardless of sex, a characteristic that has been the mechanical gain of power in making our country great and progressive.

No labor connected with cheese making necessitates any more muscular strength than does the weekly laundry work of the home. Cheese factory management or actual cheese making, for a woman, is work she can do, nearly or quite as well as a man but she must expect to work, and not imagine it an easy task.

No woman or man either should assume the management of a cheese factory unless she thoroughly understands the workings of a factory and is able to detect anything wrong at once. She should understand the machinery, be able to judge the quality of cheese made, and if not up to standard suggest how it could be improved.

This means study either at the Dairy School or in a cheese factory, or best of all in both places. I am at present a Dairy School student at Madison in company with another lady and I hope to see the day when the summer factory course of the

Wisconsin Dairy School will be filled with farmers' daughters, learning the art of correct butter making, cheese making and management of dairy farms.

Why not give the farmers' daughters equal educational advantages along these lines that are now accorded to the farmers' sons? A course of lectures and series of practical lessons in cooking should be added to the summer Dairy course, thus making the course more attractive as well as instructive for young ladies on the farm as well as for their brothers.

Women cheese makers are rarely found; it seems to be the public idea that it is rather strange or quite out of place to find a lady in charge of a cheese factory and I don't know but what that may be true to a certain extent. There is work that goes in connection with cheese making that a woman is not as well able to do as men, but I think that can be hired done and as for the work of cheese making itself she is able to do as well as men. I have made cheese 12 seasons in succession. I was the first and only cheesemaker ever employed in the Milladore factory, located in Wood county, Wisconsin; this was one of the first factories constructed in that section of the country. Last season we received in the neighborhood of 5,000 lbs. of milk per day. My assistant was a boy 14 years of age.

At first a number in the community were inclined to criticise the management for having placed a lady in charge. This criticism came from those patrons who did not like to be told again and again to keep their milk in sweet, clean utensils. I think a woman is quite apt to insist upon having better and cleaner milk delivered for cheese making than a man would.

I know that the cleanly condition of a factory operated by a woman is apt to be superior to that where the cleaning is left to the men folks. This of itself is an object lesson to patrons and will encourage them to take greater care of their milk and try to produce a nice clean article to go into a nice clean factory. And I feel quite certain that a number of persons purchase our product because they know and say that it is made up in a neat, tidy factory. I do not mean to say that the quality of the cheese is superior to that of other factories, but the

clean attractive appearance of the goods goes a long way in selling them at good prices.

Testing milk is work a woman is well fitted to do. I have always done the testing and if there was any dissatisfaction was in a position to settle questions on that point.

She can keep up with the times by taking good dairy papers. I think a woman can cull knowledge from them as well as men. Study the feeding problems and be able to suggest proper rations for milch cows, when patrons request it. Take an interest in their affairs if appealed to in case of sickness or trouble in their herds. I feel that a woman in the cheese factory not only receives much better pay, but has a pleasanter vocation than the average factory girl or domestic servant.

DISCUSSION.

Mr. McKinnon: I would like to ask the lady if she pays by the test.

Miss Raeder: We have paid by the test, but the last few years the farmers insisted on being paid by the hundred pounds, and that is the only way we can hold our patrons.

Mr. McKinnon: I would like to ask whether you pay by what you call the straight test, or add two per cent.

Miss Raeder: There were a few seasons we paid straight by the test, and the last few years the farmers thought that they would be better satisfied to know how much they were getting in the spring for the whole season, so much by the hundred for the season.

Mr. De Haan: I would like to ask how much she pays for her milk, how much on an average per hundred?

Miss Raeder: Last year we did not make an average price, the price of cheese was pretty high in the spring, and I advised the man I was working for not to set a certain price for the season, so we paid according as the cheese brought on the market, a little under what it would bring on the market.

Mr. Michels: I would like to ask the lady what were the objections to the test, what did she give it up for?

Miss Raeder: There was a real estate agent that had quite a lot of money loaned out through the neighborhood and he owned a factory there, and in order to get all the customers he could, he paid a high price for the milk, higher than the cheese would bring, and that spoiled our patrons for being paid by the test.

Mr. Michels: The other man was not paying by the test?

Miss Raeder: No, he paid by the hundred and higher than what the cheese brought, and what he ought to be able to pay; he paid it out of the stock money.

Mr. Michels: You did not give it up because you did not think the test was right?

Miss Raeder: No, we did not.

Mr. Luchsinger: I would ask so far as you know, is it not the rule to buy by the weight and not by the test at cheese factories?

Miss Raeder: We would take the milk in by the weight, but I think we are more apt to get a better quality of milk as a rule to pay by the test. The factories through the country do not usually pay by weight, but our country is new and we have not accustomed the people to pay by the test.

The Chairman: There was a matter brought before us yesterday by Mr. Odell of this city, representing the Merchants and Manufacturers' Association of Milwaukee, with regard to the centralization of cheese boards in this city or any other city of the state. That paper was read so close to the noon hour that there was no discussion on the subject at all. Now, as I stated in my opening address, it is left to the cheesemakers or to the cheese factory owners to give their consent or dissent, their approval or disapproval of this scheme, if a scheme it is. I myself have no suggestions to make in regard to it. Now, I would like to have you discuss this matter a little, as this will probably be the last chance before next year, and would

like to have you give your views on it, say what you think of the practicability of the plan.

Mr. Luchsinger: The suggestion of having a central cheese board in Milwaukee has come from Milwaukee men. They undoubtedly have studied that question and have seen something in it, some good result from such central cheese board. All of us have come together from different parts of the state and we have not had any chance to confer, we do not know what advantages there may be in having a central cheese board. Now, if the matter has been discussed here in Milwaukee and men have got together and have agreed that it would be a good thing for the trade and for Milwaukee to have a central cheese board here, they ought to be able to give some reasons how they arrived at those conclusions, and we ought to have it discussed at this meeting first, so we may know what we have to expect, that we may have something definite to think upon and discuss, and I would like to ask any gentlemen who were instrumental in getting this proposition before the convention, to state the grounds for so doing and give reasons why this convention should favor this proposition. I have not given the matter much thought, I have not had any basis to go upon. I believe that central board somewhere might be of advantage, making prices more uniform, more regular, grading the quality of cheese in a more just manner. Just how and where such a board is to be instituted I am not prepared to say, and I think if these gentlemen who have formulated something to propose to this convention were to give us reasons how they came to the conclusions they have arrived at, we may have something to base an opinion upon, something to adopt or reject.

The Chairman: I would suggest to Mr. Luchsinger that the cheesemakers are quite competent to judge for themselves in this matter, which has been advocated for some time and they know pretty well what is meant by the centralization of a cheese board in Milwaukee. They know what the centralization of the butter market in Elgin means, they know how it controls the butter market of the United States, and for that reason they can form a pretty close opinion of what a central-

ized cheese board in Milwaukee, or any other town, means. The gentleman who spoke here yesterday, Mr. Odell, stated that the business men of Milwaukee were not so much inclined to have the cheese board centralized right here in Milwaukee, but in any part of the state, and an advantage to the cheese men of the state and that they were willing to co-operate with it anywhere in the state. I would like to hear from Mr. Aderhold and Mr. Michels on the subject.

Mr. Michels: I would like to hear a word from Prof. Dean about their handling and marketing cheese in Canada.

Prof. Dean: I would suggest Mr. Millar, who is manufacturer and buyer, he can give you information better than I can.

Mr. Millar: Mr. President, I would not like to advocate the system that we have in Ontario; we have cheese boards, but they are a farce. We have seven cheese boards in Western Ontario and ten or fifteen buyers. Generally, these boards come together and sit around, and the cheeses are auctioned off, the cheeses are put on a blackboard, and there are some buyers who sit around and bid anywhere from one-eighth to a quarter less than they intend to pay, and then when they adjourn they go out on the street and buttonhole the salesman and buy as cheap as they can. I regret to say it is a very poor system and one that I would not advocate to be established in any other place. If you can get a call board where cheese is sold on the board and sold every week, I think it would be a very satisfactory arrangement, but as for one central board, I do not think that is quite practicable. We have never found it so in our country. We have boards in different parts of the Province, within cheese centers and the buyers go there and buy the cheese; I think our system is somewhat different from yours in this respect. We buy the cheese on the board, not at the factory; our system of selling is a very poor one.

Mr. Luchsinger: I understand you have an official inspector.

Mr. Millar: Well, there is an official inspector in Montreal, his judgment goes every time; but in Western Ontario it is carried on a little different; each buyer has his own inspector;

he buys the cheese on the board subject to inspection, and the man has to inspect them inside of a week or ten days after they are bought.

Mr. Luchsinger: And does that inspection hold, also?

Mr. Millar: You buy them subject to your own inspection.

A Member: Which way gives the better satisfaction?

Mr. Millar: Well, we have not a uniform inspection in Western Ontario at all, so I do not come in touch with that. In Montreal the cheese are shipped in there subject to Montreal inspection, the buyers do not go out.

The Member: Do they get more uniform prices than where they buy at those smaller local boards?

Mr. Millar: No, you see the cheese are bought on local boards, but shipped to Montreal, subject to Montreal inspection.

Prof. Dean: I know in East Ontario the plan has given rise to some considerable friction. I attended some dairy meetings in eastern Ontario where the official inspector was present, and the matter was discussed very fully. Now a great many people are mistaken as to the powers of these inspectors. A man sells his cheese to a firm, and the cheese is shipped to Montreal subject to Montreal inspection as to quality and weight; the buyer bids a certain price and the cheese are supposed to be first class, and the cheese go to Montreal and the buyer says they are not first class and the maker says they are, or the salesman; then they have the buyer call in this inspector, and all the inspector can do is to say whether they are first class or not, and he has no authority whatever to compel the buyer to take the cheese if he does not want to take them; he merely says that they are either "files" or "under files," that is the technical term that is used in the inspection, says they are files or under files, and then it is left for the buyer and seller to settle between them, and I can not see, so far as I have observed, that that has done very much good. It has in some cases perhaps resulted in overcoming some difficulty, but the factorymen say that the inspector is under the thumb of the buyers in Montreal, and that he does whatever the buyers tell him, and so on, and on the other hand the buyers say that the

inspector is perfectly free to do as he chooses, and he exercises his own judgment. It is a very delicate position in which to place a man, and I cannot see that it has done much good. I know that a number of the factories that I have visited through eastern Ontario have been very much dissatisfied, and I know at some of the dairy meetings that I have attended, that the men were very wrathy indeed at the treatment that they had received from the inspector. They claim of course that he was there at Montreal and he had to do as the Montreal buyers say, or he would lose his job, and so far as that goes, we could not recommend any plan. I do not think it is any good unless this man is clothed with authority, and that is a very difficult thing to do. I do not think a central board, as I understand the idea, would control the cheese of the state of Wisconsin, or prices, or something to that effect, I do not see how that could be practical, because cheese varies considerable in quantity; where you make so many different classes as you do in this state, it would be very much more difficult than it is in our case even.

A Member: Do you think you could score cheese and have it put on the board, and sold by the pound?

Mr. Millar: So far as I know that has never been tried. Now there is this question about scoring, to give you a little illustration. We sent down some experimental cheese to report, and these cheese were scored by six or seven men separately, and while they were all agreed as to which was first, and which was third and which was fourth, if I remember correctly, there was a difference of some 30 to 35 points in the scoring, and they were all supposed to be exports. Now, these men engaged in buying cheese, when you ask them to score a cheese, a great many of them are wholly at sea, they do not know the relation between quality as indicated by a score card and quality in commercial terms. Indeed, there are a large number of cheese buyers who, when you ask them to score a cheese by the points, they do not know how to do it, because that is not in their particular line of business, and I do not think the plan of selling cheese by points has ever been tried, nor do I think it would be practical at the present time.

The Chairman: I must take exception to the last remark made by Mr. Millar. I think a cheese buyer ought to be perfectly conversant with scoring cheese. Any man in this country can go out and buy a first class cheese, but it takes a competent man to put a value on the cheese and buy it at what it is worth.

Prof. Dean: The point is this, buyers, so far as I have had experience with them, do not seem to be able to establish a proper relation between commercial value and score points. For instance, some of the cheese that we sent out of Montreal were scored something like 60 or 65 points; a man like Ballantine would score the same cheese up to 90 and 95 points.

Mr. Aderhold: I just want to say a word in regard to the scoring. I have been present and have done considerable of that myself, and I do not believe that many of the boys appreciate what the judges have got before them when they go through a lot of cheese and try to make these fine line distinctions. Take, for instance, your cheese have been in cold storage and they are scored at a low temperature, while they are at a low temperature, say, we score them; then we take them, put them in a room that is a little warmer, leave them there a few days and score them again. The same cheese, if we do not know the scoring, if we do not happen to remember anything about the cheese, just give them another impartial scoring, after the cheese have been a little warm for a few days, you will find a big difference in the same cheese, and you will find a big difference in the scoring, I believe.

Now, the Chair wants me to speak my mind in regard to this central cheese board. That is something that I have always left to the producer and the buyer. I am neither a buyer, nor seller, nor producer, my mission simply is to try to improve the quality, and if we can get any system that will facilitate the proper grading of cheese, it will help the industry very much. I am told the cheese are not properly graded. I do not think the fact of different prices being paid at different boards of trade cuts near as much figure as the fact that there is almost no system of grading at all practiced in the state. Cheese that

are scored 88 or 90 points will bring just as much as one that scores 99, as a rule, and if you can get any system by which the cheese will be graded, say first grade, second grade, third grade and fourth grade, I do not care what the cheese would score, but if they would agree on the grades, I am pretty sure that that would help the industry very much, and I am inclined to think that not a central board, but a central curing room system is the thing that we ought to try and get,—central curing rooms at shipping points in cheese sections, and get our cheese cured at low temperatures and have them in places where they can be sold by the carload; that would be centralizing to a certain extent; that is as far as I want to go on this question.

Mr. Luchsinger: Is not that what is done now in Chicago in these cold storage places? People from Wisconsin, Illinois and all over the West send their cheese before they are quite cured, and store them there, not only for the purpose of keeping them until they are thoroughly cured, but also until there is an opportunity to sell, and by that means Chicago has become the great cheese market in the West. Is not that what has been done there, and perhaps that is what is intended to be done here in Milwaukee.

Mr. Aderhold: The producer does not have much cheese in cold storage; it is the dealers that put them in.

Mr. Luchsinger: From my knowledge of the producers I might say they are the dealers and producers too, and a great many of the dealers and producers do send cheese to Chicago to cold storage because there is no place anywhere else, and leave them there, sometimes a great many carloads at one time, until they are in a condition for sale and until the price is right. It is simply a central place for the accumulation of the product of a great section of the country. If that is the intention on the part of Milwaukee and it will afford the same facilities, why, probably in time a market could be built up here, just as it has been built up in Chicago.

Mr. Aderhold: You are referring mostly to the Swiss cheese trade.

Mr. Luchsinger: All the cheese that are made in our section of the country.

Mr. Aderhold: They are graded before they are shipped out by the factory men, are not they?

Mr. Luchsinger: Yes, to a certain extent they are.

Mr. Aderhold: That is the trouble with us, they are not graded properly. The Swiss cheesemakers grade their cheese.

The Chairman: The question before us is the advisability and practicability of having a central board? Now is it advisable, and if it is advisable, is it practical? Speaking from our section of the country, I should say it is decidedly unpopular.

Mr. Anderson: I do not think the conditions are ripe today for a central cheese market, and in no case do I think we should have a board similar to that of the Elgin board, I would not be n favor of that at all. But there is on thing that it would be perfectly right for us to have, and that is better curing facilities. Very few factories in our country have perfect curing rooms, and that is where I would support the idea, to take a step at a time in this line and have small central curing stations established.

Mr. Michels: I would like to ask Mr. Anderson what his objections are to the methods of the Elgin board of trade, and what is the difference whether they sell butter or not so long as they have a responsible committee to make prices and save the expense of hundreds of men going to the Elgin board of trade every week to sell butter?

Mr. Anderson: I do not think, to come right down to the point, that it is their business to sell goods at a fixed price, that is what they do. When they have something to sell they want to have it put right up and sold at the ruling price, but that board, as far as I know, is run by speculators and dealers, and the sellers have nothing to say.

Mr. Aderhold: I would like to ask Mr. Michels if anything is done on that board for the proper grading of butter.

Mr. Michels: No, there is not, that I know of; but I do not see where it would be necessary. Supposing we would have

a central board and they establish a price every week; now, we will say they go too high, they run the price higher than the market could stand, or lower; why, in that case it would be just the same as the Elgin board, we could make our products and we could sell our cheese on contracts, just as butter is sold on contract; and everyone who has sold butter on the Elgin basis knows how hard it is to get Elgin prices; you cannot get Elgin prices; you can on the Chicago market, but you cannot on the Elgin market. So it would be in the case of a central board of trade: if they keep the prices higher or lower than what they ought to be, why then, we, as salesmen, would contract for so much above or so much below the board of trade prices.

Mr. Schultz: I have been a member of the board of trade at Elgin years ago, and the price established there is for the very finest butter that is made in this country, and they try to keep the price up as high as they possibly can; that is why they generally have the prices a little higher than on the other market.s You cannot get Elgin market price in this part of the country.

Mr. Michels: I would like to ask the gentleman what he thinks about the Elgin board, whether he thinks it is a benefit to the factorymen and the farmers, or whether it is not?

Mr. Shultz: I think it is a benefit to the factorymen. I have been selling butter for ten years.

Mr. Michels: It is a still bigger benefit to the farmers?

Mr. Schultz: Yes, it is.

Mr. Michels: I always find, whenever I meet Chicago buyers, they always make thieves of everybody that has anything to do with the Elgin butter trade; they are awful hard on them, and I do not think that is right, andI think that gives most of the cheesemakers in this audience a wrong idea of what the Elgin butter board is.

(Mr. McKinnon was called to the chair.)

Mr. Luchsinger: To test the sense of this meeting in some way in respect to this matter, I will make a motion that a committee of three be appointed by the chair, to confer with a committee on the part of the city of Milwaukee on this subject, and to report at our next annual meeting.

Seconded by Mr. Powell.

A vote was taken and the chair declared the motion lost. A division being called for, a rising vote was taken, and the motion was lost: ayes, 27; noes, 46.

FANCY BRANDS OF CHEESE; ITS MANUFACTURE AND SALE IN THE UNITED STATES.

Hon. John Luchsinger, Monroe, Wis.

Mr. Luchsinger: Mr. President, Ladies and Gentlemen:

I have been requested to speak to this Association on the subject of Fancy Cheese and its production and sale in this country. Now the term "Fancy Cheese," is a somewhat indefinite one. I assume that in a general way you might call any kind of cheese "fancy" that is out of the common, general run of cheese, that is, out of the common run of productions. Perhaps it would be correct to say that any variation even in staple production might be called fancy.

Fancy cheese has come in response to a demand for variety from those who use cheese. People do not like to use the same kind of cheese in the same form for a very long time; they get tired of the one kind of cheese, and if there is nothing else offers, a difference even in the shape of the cheese will satisfy the craving or longing for variety. You know that out of the same vat, out of the same lot of curd it is possible to make a cheddar, what you call the Twins, the smaller forms, the Long Horns, and the flat pound cheese; they are all different in shape, apparently they are different kinds of cheese, yet they can be made of the same curd by the same

maker. There is a reason for this craving for variety—people no more care to eat cheese in the same form for long than they care to eat one kind of meat all the time. Why the difference in the matter of cigars and tobacco? People get tired of one brand, and if the same cigar, when it is out of fashion, is branded with something else, why, it goes again, and it is so with cheese, and people are willing to pay for variety and they do pay for it, as I will show you in the course of my remarks. No more nutrition, no better article than the staple varieties is given, yet people pay two and three and four times more for something fancy than they will for a staple article that is just as good, just as nutritious, simply because they want a change. Right here I ought to say that if cheesemakers would try their very best to make the staples always first class, there would be less danger of people getting tired of eating them. If you had cheddar cheese all the time such as the one that was cut here yesterday, people would eat a great deal more, and the demand would increase correspondingly, but the trouble has been, we do not produce our staple cheese in so uniform good quality all the time as we ought, hence the consumption falls off and people look for something else; and they are going to have something else, no matter what it costs. Perhaps the Canadians are ahead of us a little in that respect; perhaps their endeavors to make a uniform, first-class quality of cheese have met with more success than ours, and hence their export of 70,000,000 pounds of cheese in a year, in comparison with our 27,000,000, although the extent of our dairy territory is greater than theirs. They have established a reputation for uniform good cheese and therefore the consumption of it in their markets, instead of diminishing, has increased.

Now one of the best cheeses, called fancy, introduced into this country, has been the Swiss cheese. A lot of poor emigrants from Switzerland came perhaps 50 or 60 years ago into Wisconsin and did not have anything much in the world; they did not have a great deal above the $15 in cash that is nowadays required of every emigrant that lands in Castle Garden,

but they had what was very much more valuable, they carried with them the art of making Swiss cheese, they brought it to Wisconsin, and from their small beginnings it has now reached a yearly production of over 15,000,000 pounds in Wisconsin alone. They had, first of all, indifferent success. They had to adapt themselves to the climate, to soil and grasses; it was only after a great many failures and experiments that they have finally succeeded in making a standard article that will pass muster in the markets and will sell at a steady and remunerative price, and in quality and richness will compare very favorably with the imported article.

Early this morning I went into one of the largest cheese houses in this city, which sells cheese at wholesale and retail, and I was shown an imported Swiss cheese and was shown one that was produced in Green county, Wisconsin, and any one that was not informed beforehand could not tell the difference, either in appearance, taste, size, or anything else, and yet the one, because it had come across the ocean, sold for 30 cents at wholesale, while the other sold at 15½. People are willing to pay for something that has a name, for the sake of variety.

One of the next kinds that has come in—I have samples of some of these that I am going to name, was the Limburger cheese, that came from Limburg, province of Holland, where it originated. The low, flat pastures in that country were well suited to the production of this kind of cheese, and perhaps of no other kind of cheese in the perfection that this is. It is a very rich cheese and were it not for the smell of it it would be very much more popular than it is. Now this same wholesale house has told me that there is fashion in cheese,—fashion in eating cheeses, corroborating my opinion about it surprisingly, I did not expect to be corroborated in that way. They said when Limburger cheese was first imported, and afterwards began to be made in this country, it was very popular, and they could hardly supply the demand for it, but it has gone out of fashion, and where they used to sell ten carloads of it, they hardly sell one. People have got tired of that kind of cheese; it perfumes everything it comes in contact with. If you have

half a pound in your pantry or kitchen, it pervades the atmosphere of the whole house.

Next came brick cheese. That just now seems to be a favorite cheese. The same house tells we that where they sold one car load of brick cheese some years ago, they now sell ten. It is a universal favorite. It is not what is called a long-keeping cheese, it is a soft cheese, not so soft as Limburger, or as soft as some of these French varieties that I have brought to show you, but it is a rich, good, wholesome family cheese. It is put up in the shape of a brick, perhaps a little larger than a brick, hence its name, brick cheese, and not because it is as hard as a brick, and it is of a size that is convenient to use in a family. A family may buy one and use it up and there will be no waste, and the dealer sells it off hand also, without cutting, that makes it a favorite with the trade also. Possibly it may go out of fashion one of these days, and something else will take its place. I want to say right here, it behooves the cheesemaker to keep up with these fashions. You may think they are foolish; you may think that you ought to control the market, that your make of cheese ought to be eaten, —well, you cannot control these things, you have to keep up with the fashions, you have to supply the demand, and you will get paid for it too. You must get out of the rut that you have been in. Because you have all the time made Swiss cheese or cheddar cheese is no reason why you should remain at it if you can do better. And a great many cheesemakers, a great many dairy schools have caught on to that idea. Many have adapted their factories to the manufacture of several kinds of cheese, and the dairy schools are giving instructions in the making of the different kinds. I want to say that our dairy school in this state has begun giving instructions in many varieties of cheese. It was many years before the board of controlling officers could see the propriety of it, but when they found that there were fashions in cheese, as well as in other things, they saw the propriety of giving instructions in making the fashionable kinds, and I hope it will continue so, and I hope every young man especially who intends to make dairy-

ing and cheesemaking his profession will see the advantage that is going to arise to him in getting instructions not only in making first class cheddar cheese, or Swiss cheese, but every other kind of cheese that can be made and for which there is a demand.

I will say that most of this cheese I am going to show you, of foreign origin, and which was formerly imported, is now made in Wisconsin. Here is a piece of Neuchatel. It is a very soft cheese, you can press it as easily as you can butter, and it is put up in this form and in these packages, covered with this tinfoil so that the air cannot come in contact with it to spoil it. It is really not a cheese at all, it is simply curd, sweet, good, wholesome curd made out of rich milk, but it is never ripened as we are accustomed to have cheese ripen; it is a very good, very palatable cheese. These are two ounce pieces; one of these costs 5 cents or about 40 cents a pound; it does not cost you any more milk to make a pound of this than it does a pound of cheddar cheese that sells for 12 or 13 cents at retail. This has come in response to demand for variety, that is all, and it is considered a delicacy. It is good, but it is not a long-keeping cheese at all; after it is exposed to the air it has got to be eaten very soon or it will spoil. What makes the price of this as high as it is, is the fact that there is a great deal of labor required in putting it up. No more in hauling the milk, milking the cows and all that, nor in setting it to thicken, but the matter of draining the whey from the curd, of manipulating the curd, salting and packing and all that, requires a great many hands, boys and girls to a great extent, hence that raises the cost of production. I think it is a desirable thing, wherever there is the demand in a community for the production of this kind of cheese to produce it for the reason that it employs a great deal more labor which can be paid for out of the increased price of this cheese. I want to say in connection with this,—here are two kinds, one kind is made entirely of whole, rich milk, the other kind is made of skim milk. Now here is where danger may come in the manufacture of this or any other kind of cheese. People will be

tempted, because an article goes for a little whole, no matter whether it is skim or full milk, to make the inferior article, they will put it upon the market. The manufacturer may be honest enough and sell it for what it is, but the dealer very often is not, and he will give the inferior to the public at the price at which full cheese is sold, and it will go for a time, but the people are not long in discovering that there has been fraud practiced, they are not getting the richness, the fat that they are entitled to, and there is danger of running the producton of this delicate cheese into the ground on that account. No matter what kind of cheese is made, we must be honest about it, and give the people what they have a right to expect; if we do not, we may get a little more money perhaps for the time being, but may damage the trade for many years afterward.

Now, here is another variety of cheese, very soft also, just as soft as butter, almost the same thing as the other, it is made of curd and it is called the Swiss cream cheese, and it is made of the curds with the addition of cream. This is also a two ounce package, selling for ten cents, 80 cents a pound. A great deal of labor is connected with this, and where there is a demand for it and you are located right, it is profitable to enter into the production of it, you supply a demand from people who are willing to pay a large price for a rich delicate article.

Now, here is a kind of cheese also very much in demand and which sells for a high price; looks like some of the old home made cheese after it had become partly decayed, got old and moldy. This is what is called the Roquefort, a French variety of cheese. It is esteemed very highly; people who get a taste for it will not eat any other. Formerly it was altogether imported from France, those green streaks that we see through it are really mold artificially produced. The secret in making this cheese is to know how to produce the artificial mold. It is not my place here to give that process away, but in order to make it in this country, they do the very simple thing of sending to France and getting a man who knows how to make it, giving him high wages and bringing him here, and that is the fact with all these fancy cheeses the production of which is

brought here,—having people come here who understand the making of it. Roquefort also sells for a price at least five times as high as the ordinary standard cheese. People are willing to pay the price for the fancy part of it.

Here is another kind of French cheese, the Isigny. This is a soft cheese also, not so soft as the former cheeses, and it is ripened fully, but is made at a somewhat cold temperature, not pressed at all and set to drain on a mat which lets all the drainings through, and left until it gets ripe in that way, then put in a box, covered with parchment paper. It is attractive in appearance and good to eat, also sells for at least four times as much as staple cheese per pound. Here is another form of Isigny which recalls the difference in cheddar cheese that I spoke of before. These two cheeses have been made in identically the same manner, only put up in different form and given a different name. The little one sells a little higher than the other simply because it is smaller and appears a little more tasty.

This is the Camembert. In the same factory with these are also made what are called the Brie cheeses. They are made a little less firm because they can be spread almost as easily as butter on the bread.

Now, here is an Italian cheese, the Parmesant; so far as I know there is none of this made in this country. This is a very hard cheese, and it has to be grated before it is used, and put up in bottles to preserve it. It is used more to apply to foods in cookery. The Italians use it largely to eat with their macaroni and vermicelli to give them flavor. It is very largely used in this country, especially among people from the Southern countries, and the demand for its manufacture will be met sometime by geting some expert from Italy and start the making of this cheese. Perhaps it is being made now, but I have not any knowledge of it. Before I forget it I will say that our own cheddar cheese when taken to Italy is considered a fancy cheese, because they have not much of it, they do not make it to any extent, it is because there is a demand for something different there, just as there is here, that a few years

ago a large cheese firm in Turin determined to make cheddar cheese in Italy, and they did exactly what we do when we want to make their kind of cheese here, they came to this country and got one of our expert dairy school cheesemakers, offered him high wages and took him out there to teach them how to make cheddar cheese. And now there are several factories making cheddar cheese in Italy as a fancy variety.

Here is the Roquefort cheese in still another form. It is, to give variety, crumbled and ground up and put in small jars and sealed up, so as to keep it in perfect condition, and in consequence of this difference in putting it up, in its preparation and additional labor, it sells for twice as much as this in the other form, and a sharp Canadian has originated putting up Roquefort cheese in this way. It bears the stamp of McClaren of Toronto, most likely that is one of the reasons why they are exporting more cheese then we are, because they get onto those things which fill the demand for variety.

The Chairman: We might do more if we had the same assistance from the government that they have from theirs.

Mr. Luchsinger: Well, they are pushers, hustlers, they help themselves a great deal. Now, here is something,—you see a great many of these in the stores. Seeing this for the first time you would not think it was cheese at all, you would think it was almost anything else. Now this cheese, because of the manner in which it is put up, has one quality that no other cheese has, it may be kept ten, fifteen, twenty years, and will not change, put up in a box, I do not know but what it may keep fifty years, I do not know why it should not last as long as a rock, it is nearly as hard as a rock. Now, this comes the nearest to making something out of nothing of anything in the world. This is made out of absolutely skim milk. It is the so-called Sap-Sago or green cheese and is made in Switzerland. This piece is imported. We used to make it in Green county fifty years ago, farmers used to make it, its home is in Switzerland, in Glarus. It is made nowhere else in Switzerland and they not only use in making it all the skim milk curd produced in that county, but also carloads from surrounding counties,

and even from Austria are shipped to be ground up and converted into this kind of cheese. The demand has become so great that Glarus is not able to produce enough to supply it. This is, as I said, made from absolutely skim milk but it must be sweet, it is unfit if at all sour. I think the milk produced by separators would be all right. It is curdled by means of sour whey at a very high temperature, boiling heat, the curd is then set aside to ripen. When it is sufficiently ripe, it is run through a mill which grinds it up very fine with a certain proportion of powdered sweet clover, or a plant that is of the same family and looks very much like it. This cheese when ripe is hard and of a uniform dark green color and is grated for use; it is used not only as a flavoring for certain dishes, but it is also eaten with broad on butter, or, as the poorer classes in that country use it, as a flavoring for their potatoes. It is said that some people who are accustomed to this cheese will never do without it; they ascribe to its use a great many wholesome properties, asthmatic people claim to get great relief from its use, dyspeptic people claim it is very good in their cases. A great deal may be imagination, but there may be some truth in its ascribed virtues. This article in time may be produced in this country in large quantities. This piece costs ten cents at retail, it is less than a quarter of a pound; the raw material in it costs about a cent and a half, the rest is all labor and profits of dealers and duty.

Now, in conclusion, I would not advise every cheese maker to make all these fancy varieties of cheese, but I am quite sure that in Wisconsin we have the situations, the locations and grass and water to make each and every one of them to perfection, and whenever there is a demand for them, they can be made and the demand met. It is not wise for everybody to go into the one thing but it is a good thing for the whole profession for some to make one kind and some other kind. To be sure it requires a great deal more knowledge and experience to make so many different kinds of cheese than to make one kind of cheese; it requires more labor, more tools, and all that sort of

thing, but it is the duty of every intelligent cheesemaker to so fully inform himself on the details of his business that he may be able, when occasion requires, to make any of these varieties, or all of them, if necessary. I think we have the enterprise, we have the intelligence, and we are competent to deal with this question of fancy cheese and to adopt the making of these different varieties, and if I have succeeded in calling the attention, especially of the young cheese makers here, to this fact, to the fact that these can all be made in Wisconsin, and are made in Wisconsin, I shall feel that I have not taken up the time in vain.

DISCUSSION.

A Member: I would like to ask Mr. Luchsinger to repeat the name of that skim milk cheese.

Mr. Luchsinger: It is what is called Sap-Sago cheese. This piece is made in Switzerland, but, as I said, we have made it in Green county, Wisconsin. It requires a mill to grind it, to make it in large quantities, to make it as nicely as this is made, but it can be made by hand. We used to put it into a teacup, press it as hard as we could and leave it there until it got hard enough to hold its form. It is not necessary to have a great amount of machinery, but in order to produce it on a commercial scale, it would be better to have it. The term sap-sago does not convey any idea about it; how it got that name I cannot understand, except for the English tongue refusing to pronounce the proper name for it. In Switzerland it is called schab-zieger; that comes very near sounding like sap-sago, and because we cannot say schab-zieger, we say sap-sago. It means grated curd.

BREEDING AND REARING A PROFITABLE DAIRY WORKER.

Mrs. Adda F. Howie, Sunny Peak Farm, Elm Grove, Wis.

Mr. President, Gentlemen and Ladies: While in a Northern town yesterday I chanced to take up a Milwaukee paper and naturally being interested in the Cheesemakers' Convention I began reading about your meeting and was given something of a setback when I saw that a woman was to startle the cheesemakers by speakng on a topic that the men had heretofore thought belonged wholly to themselves and that some of the members had expressed themselves as displeased with this innovation. Somehow I was not surprised. I had expected a number would object for if you have ever given this matter attention you will have observed that when a man is putting forth his most commendable efforts in any line of business he is always glad to receive the approval of some woman, but when he has a sneaking consciousness that he is not doing his best he never courts the advice or criticism of the opposite sex.

Perhaps I ought to make a slight explanation. When I was honored with an invitation from this association to speak here, womanlike I was so puffed up with vanity that I was glad of almost any excuse that would permit me to meet with this distinguished body of men and, then again, it occurred to me that I knew nothing whatever about cheesemaking. I had heard that the moon was made of green cheese and yet had never been near enough that celestial orb to dispute it. Still, when I came to think the matter over I concluded there were two branches to the science of dairying, one buttermaking and the other cheesemaking, and while I belong to the buttermaking class, today out of courtesy I will admit that the buttermakers are in the kindergarten and that the cheesemakers are in the high school grades of this vocation, but shall quite as firmly insist that the foundation of all dairying is the little cow herself, and

it appears to me a most fitting subject for a woman to discuss. In fact, every woman in the land who uses the product, either milk, butter or cheese upon her table should take an active interest in this most essential part of the business because if we do not have good and properly cared for cattle how can we expect to produce a wholesome product? I will concede that there has been great progress made during the past few years in the methods of butter and cheese making and yet I believe that being possessed with the prevailing American spirit we have been just a little bit too rapid for a permanent improvement. We have begun by putting the cart before the horse, for while much stress has been laid on the purity of milk and the consistency of curds—I must not get beyond my depth in this —we have heard little about the cleanliness of the cow barn and the care of the cattle that produce the milk from which this valuable product is made, and while I have no intention to apologize for speaking to you on this subject it may not be amiss to remind you that if you will put your brains into active service you will readily remember that the calf that mother and the girl raised always made the best cow. Why was it? Not that mother and the girl were wiser or more determined in their efforts to bring about good results but because there is a tie of sympathy between the human and the bovine mother and that tie is the bond of motherhood, therefore I sincerely believe that a woman is capable of better understanding the conditions and requirements of a cow barn than a man, and I see no reason why she should not discuss—and with profit—these vital questions. Now I would not like to give you gentlemen too rude a shock else I would tell you at once that all the best breeds of dairy stock in the world were developed by women, yes, I would emphatically make that statement, and if you regarded it with doubt I would take you to Switzerland where the cattle are held in such esteem that the very cow bells are beautified by the highest art of the engraver; where they are handed down for hundreds of years from generation to generation as a precious legacy. I would go still further and take you to England and Scotland where you might see the most beautiful cattle bred

up to the highest state of refinement; again to Denmark and Sweden, to the Isles of Guernsey and Jersey, where it has been recorded of the latter, by a noted historian, that centuries of gentle care, under the management of women had developed this noble breed, and then I would go with you to Holland, for it would be a pleasure to show you those beautiful, sweet, clean barns where the Holland women have brushed and petted and loved and tended the handsome cattle with such beneficial results that the master and his herd may sleep beneath the same roof. I once spoke of this at an Institute and a farmer jumped up and indignantly said, "You come here to teach us progressive methods and do you advocate that we should live in a cow barn as they do in Holland?" I looked him squarely in the face and replied, "Yes, that is my ideal, that you should have a condition so perfect that it would not be detrimental to any one to live under the same roof with the cow." And, do you know that I firmly believe that if that man had been obliged to live under the same roof with a good wholesome cow he would have been elevated (laughter and applause). And I feel sure that if some dairymen were compelled to inhabit the same building with their cattle it would be a good thing, they could not live long, but that would be an extended benefit (laughter). Now if we make claim to be progressive Americans, as undoubtedly we wish to be, what is the first step to be taken in a course tending towards the betterment of our work? This gentleman has told you that we send to France and Italy and elsewhere in order to secure competent instructors to teach the best methods of handling the product. Then why not send to these foreign countries and bring over some of the dairy women and humbly ask them how to care for cows in order that we may secure the best results. Ask them, never mind if their methods are foolish and mingled with a good bit of sentiment. To the present time the American cow barn has not been overstocked with sentiment. Painstaking thought should be given to the subject before undertaking either branch of this business, such as, which line do you intend following, what breed will be best suited to your needs; and what is quite as important a factor

in the elements of success, the barn and it arrangements for the health and welfare of its occupants. Many an up-to-date barn that has been provided with every known convenience will be found lacking in its most important features. I have known of men who had enthusiastically entered the dairy business, had built a large barn; put on four or five lightning rods to show their good intentions and then begrudged the cattle the comfort to which they were entitled. The all-absorbing ambition seemed to have been the saving of labor. Ah, is it the saving of labor that is going to develop a superior class of stock? Why not let the first thought be, what is best for the cattle, because it is necessary to consider the health and welfare of our animals in providing for their wants. A woman would never for an instant think of permitting a cow to lie on a cement platform. Stop and give it thought. A cow with a sensitive, tender udder, that has been developed to her highest capacity in milking, no, a woman would never dream of such an inconsistent way of promoting an animal's usefulness, nor would she put a cow that was expected to freshen within a few months—or at any time for that matter—upon a sloping platform, because from the strained and unnatural position she would have every reason to expect disaster. No, she would not write furiously to the dairy papers for remedies when by using a little common sense she might be able to avert a lamentable scourge. I have known of men, who wished to build up their herds. They had learned at some farmers' institute that the proper way to begin was by placing a pure bred sire at the head, provided that a herd was composed of native cattle. They would look about and some breeder would offer to sell one cheap for the reason that it was not quite up to a breeder's standard, but good enough, they would explain, to grade up a herd. Is such an animal good enough? Right here we must use caution. There may be some defects in color or fancy markings, not necessary to the development of a profitable dairy worker, still there is one essential that cannot be overlooked, and that is constitution. It is a positive requisite to the upbuilding of a profitable working herd. Therefore, when selecting a sire, remember he should

have an abundance of lung power in order that he may be able to breathe large quantities of oxygen, plenty of heart room, a clear bright eye, a fine mellow skin indicative of perfect health and an altogether vigorous and thrifty appearance. The same painstaking care should be exercised in choosing the mother. She should have proven her worth at the pail and churn. If both sire and dam are in perfect health, we now have a foundation stock worthy of our earnest thought and most careful attention. And if the mother has received proper care and food, when the little creature comes to the herd it will be a bright-eyed, lively, fearless little thing. Some dairymen of note will tell you to take the calf away at once, but, if your cow is the type I have in mind, she will be of a highly nervous temperament and any excitement caused by such a procedure may bring on serious trouble, possibly a case of milk fever,—and anyone who has ever had that disease in his herd will not wish to see it there again. So, unless the mother's milk be too rich or contains some element harmful to the calf, I would suggest that the calf be left with the cow for three days, and even then let us use humane methods when separating the mother and her little one. The calf may be put in a pen built across one corner of the box stall, so high that it cannot reach the udder of the cow and yet the cow may lick and fondle it to her heart's content. The mother may now be turned out but will undoubtedly return in a short time, wild-eyed and terror-stricken, because for years we have bred terror into our cattle, a terror of separation from their little ones. Now, if we are to improve our methods and our stock, let us breed it out. Leave the door of the stall open. When she returns, let her see that no harm has befallen her little one. Speak gently to her that she may be reassured of your kindly intentions. I have known many a cow treated in this manner to quietly go back to her place in the long row of stalls and voluntarily leave the little one to the care of the herdsman. The first step in a calf's education is to teach it to drink. I have seen men, real nice men, who belonged to a church and who would not swear only under great provocation, who would plow all day rather than attempt to teach a calf to drink. I

have seen such a man take a pail of milk, roll up his sleeves, set his teeth as though he were going to a dentist's chair, and march out to that poor little inoffensive calf. Then he would put the pail down, grab it by the ears, throw one leg over its neck and then ram its head down to the bottom of the pail until the bubbles came up. Is that the humane way to teach a calf to drink? It will kick and struggle. Why, of course; wouldn't you? Yes, you certainly would if your nostrils were down in the milk and you were drawing milk instead of air into your lungs. One should use a little sense. Now, I will tell you how mother and the girl would accomplish this task. They would get the little one in a corner and pat and pet it, talking so tenderly all the time that it would never realize that it was being managed. Why, I have even seen women who would get a man in a corner and manage him so beautifully he never knew he was being managed at all. (Applause and laughter.) Well, a calf is seldom wiser than a man. A woman will dip her hand in the pail, with the finger tips showing a little above the milk, and while she is talking and stroking it the head is pushed gently down until the lips touch the milk and grasp the fingers. So soon as it begins drinking the fingers are withdrawn. Perhaps the head may come up and the same process be repeated. A little time and patience will be required, and I have known them to drink after the first lesson; again, it may take several. But humane methods from the start will pay big dividends in the cow barn. Begin with the foundation stock. One cannot pet or love them too much. It is an essential part of their training.

Until a calf is three weeks old, it should be fed three times daily, two quarts of clean, warm milk each time,—98 degrees is the proper temperature. At the end of the first week a small portion of the milk may be skimmed, and by the end of the second or third week, the entire amount may be skimmed. One should not think that because the milk is skimmed the calf would be able to take a greater amount. By skimming, the butter fat alone has been removed. There yet remains all the caseine and other solids which will amply supply the bone

and muscle forming elements necessary for the development of a dairy animal. After three weeks the six quarts of milk may be divided into two feeds a day. In bringing the milk up to a proper temperature the can should never be set directly on the stove for fear the milk may become scorched. Plunging the can in hot water is a better means of attaining the right degree of heat. It is not necessary to ever raise the quantity of milk, for as the calf grows older and requires more liquid, water may be added. However, a larger amount of milk may be given if a little is cautiously added from time to time. From the day of its birth it may be given clean, bright hay. The hay should not be thrown in the pen where the calf may walk over it until it becomes soiled and unfit for food, but should be put in a rack where it will be kept fresh and clean.

Another very important thing in raising a profitable dairy worker is plenty of sunlight and pure air. The calf pens should be so arranged that they may be flooded with sunlight. They must also be kept dry and clean. A little fresh bedding scattered over a wet, filthy surface, is not sufficient, for the moisture beneath will prove harmful in the extreme to the rugged constitution that should be the foremost object in calf raising.

At the end of the second week a little box may be placed in one corner of the pen in which a small quantity of whole oats or bran may be put. After the calf has finished its milk, a little of the grain rubbed on its nose will soon teach it to find the box. We now have it in a thrifty condition, and if care is exercised as to the temperature of the milk, the cleanliness of the pens, the sunlight and ventilation, the calf is well started on the road to a course of future usefulness.

The fall and summer calves are left in the stable until after the first flush of grass is over. We do not want to put them out which there is too much succulence in the grass, and then if there is not enough pasture they should have a soiling crop. When a heifer is from five to six months old, take away the grain. Make her satisfied with roughage. But give her

enough roughage. Be sure she has good, pure water. You may give her a little from the start. The old Connecticut rule is, sixty quarts of water a day for cow at flush of milk. The spring and summer calves are kept in until September, then are put on pasture.

Now, if a heifer is thrifty and well and has grown naturally, we do not want to force her, just a steady natural growth. She should become a producer at an age of from 20 to 30 months. I should prefer to have her about 23 months old. Three months before she is about to freshen give her extra care; begin and grain her gradually at first, then until she will take with profit all that she can eat readily. Begin to groom her in order to stimulate the circulation. You may go to hundreds of farms and the horses will be found sleek, but the cattle will stand day in and day out in their stalls with never a brush or curry-comb touched to them. And it is far more essential for our cows to be clean than our horses, because we are to eat the product of the cow. This heifer should be put in a stall, should be made to feel her importance. Of course she has never been curried with a milk stool, has never been touched up a bit with a pitchfork. You have never done any of these things if you are going to have a first class worker. Make her think she is of some consequence. Brush her and curry her. Why, I have known men, horsemen, when they were going to drive a horse they would give it every advantage possible for freedom of limb and muscle. They would select the finest harness, carefully adjust every buckle, secure the lightest sulky they could get, and even make the driver diet that his weight might not hamper the horse's speed; and we dairymen, who should give a cow every advantage, should give every freedom of muscle and limb and body and head, in order that she may do her best work and produce a wholesome product,—what do we do? Well, you do not do it, and I do not do it, but I have known people to put a cow in a stanchion with her head firmly held like a criminal in a stock. Now, if you have ever been out into the pasture and noticed a cow lying down

in a natural position, you will have seen her resting with her head upon her side as nature intended that she should. "We can care for them better in this way, it only takes a minute," is the excuse given by some dairymen. That is where we make a mistake; it only takes a minute, and we are throwing away the greater part of the profit because we are not willing to give the time and attention necessary to insure the best results. We are not only doing that, we are doing worse. We are ill treating the animals that God has given us for our profit and pleasure.

When this heifer is in the stall, brush her and groom her and pet her, handle the udder to familiarize her with the milking process and then, when she freshens, there will be no heart-rending "breaking-in," there will be no kicking and stamping about the stall. She may look about and step about when she hears the milk falling into the pail, but if you give her a kindly, reassuring word, in just a day or two she will stand chewing her cud like an old cow. Now, I beg of you, go to the old country and bring back another method, that is, of milking three or more times a day. I have heard Americans say, "It is all I can do to milk twice a day." But cannot you see that if you had left the calf with her, from time to time it would have relieved the udder? You have bred her to give a large flow of milk; you have fed her for the same purpose, and now that she gives it, be humane enough to take it from her and not allow her to suffer. The first milking season should be prolonged up to the second freshening, if possible. Before she freshens for the third time, let her go dry for two months, then when she freshens you have a cow that will, as a rule, prove a profitable dairy worker.

Let us give more conscientious thought and care to the breeding and development of our dairy cattle. We Americans are willing to spend large sums of money in importing cattle, but we are unwilling to give the time and thought necessary for their proper care when we have them here. We secure the finest types of the fancy breeds which should furnish us good foundation stock and, with the vanity that is so prevalent

among Americans, our ambition is to take sweepstakes at the fair. We stimulate and cram them and bank their udders until their usefulness is totally destroyed. They are unfitted either to reproduce their like or as milk producers, and then we step out of the ring with a few paltry blue ribbons that have been won by torturing the life out of these helpless creatures. We have failed to improve them in any respect, and we take our money and go back and buy more.

DISCUSSION.

Mr. Mason: I would like to ask Mrs. Howie how often she feeds the cattle.

Mrs. Howie: The milking cows are fed twice daily, but we do not keep them eating all the time, they have a variety of food, silage, oat and pea hay and clover hay and grain. We grain them the entire year around.

Mr. Waterstreet: Would you advise feeding a calf a week old oftener than three times a day?

Mrs. Howie: No, I would feed it three times a day, two quarts of milk at each feeding, and no more until it is three weeks old. Then, if it is growing, and strong and thrifty, you may add a little more, but be very careful, because you may throw it back at any time. Should the calf become sick, cut the ration in two, begin again and work up not quite so high. You may add more as the calf gets older. It is not necessary, because as it requires more liquid, you can give it water, but it is a good idea when it becomes older to give it more milk.

Mr. Waterstreet: How long would you advise feeding a calf skim milk?

Mrs. Howie: We do not make cheese on our farm, and we have a great deal of skim milk and sometimes we feed them up to a year, fourteen or fifteen months, until they are almost ashamed to come up to get their rations.

Prof. Woll: You recommend milking three times a day,

for how long a time would you recommend continuing that practice?

Mrs. Howie: Until the udder will contain the milk without inconvenience to the cow. We have practiced it up as high as five months with profit. Now, perhaps you gentlemen may laugh at this and say it is all sentiment, so we will come right down to the hard, cold dollars and cents, that is what touches an American heart quicker than anything else; if you will milk three times a day, you will raise your product from 2 to 4 lbs. per day, you will raise the per cent. of butter fat from one-half to one per cent. and that will pay you for the extra milking. I would not advise continuing this milking process any longer than that, they do in some countries much longer than in others, but I believe that the mother should be given more time and strength and not have it go to the product, so I would advise at least five weeks for every cow in the herd, young or old, from the day she freshens milk her at least three times a day for at least five weeks, then you are pretty safe, you will not have the danger of milk fever, if you are careful and do not put them on cement platforms

Mr. Aderhold: How do you break off milking the third time?

Mrs. Howie: Well, we simply leave off, if the udder is not so distended as to cake, we watch, and if we find it is at all painful, milk her at the regular time, usually first in the morning, we arrange the milking accordingly.

Mr. Short: May I ask what kind of a floor Mrs. Howie would recommend.

Mrs. Howie: Any kind that will not cause moisture underneath the cow and is not too hard. We know if we put a cow on a cement floor, that the moisture drawn from her body is not absorbed, and you will find a damp spot where she has been lying. We know that if we slept on such a bed we would have rheumatism in a few weeks. I would advise a dry plank floor. If you have a cement floor which is easily cared for, make a platform of boards above, and do not put it on a slope; that may be all right, as far as being more easily kept clean, but

take my advice, if you slope it, do not slope it more than half an inch, and when you put on your bedding, raise the back with the bedding, so that the cow may lie level, or if in any other position, that the weight of the body falls towards the shoulders rather than the other way, if you would save your herds from disaster.

Mr. Libcke: I would like to ask Mrs. Howie in what way you would tie the cows; you do not approve of stanchions, would you tie them at all?

Mrs. Howie: No, we have a stall in which they are perfectly free to lie down, put their heads on their sides, they have perfect liberty; it is so narrow they cannot turn around, three feet and three inches, a succession of doors that can be drawn back and leave a straight platform without posts at the rear, one fastened to the other by chains right along. I have a little model here for any one who would like to see it after the meeting. They are not patented, and every one is absolutely free to use them. They are very cheap, I do not believe in expensive barns, but I do believe in more extensive care of the barns. I believe in whitewashing barns for sanitary conditions; I believe in thoroughly cleaning the cow barns for the benefit of our customers and for the pride we should take in our work; I believe in doing everything we can to make as near perfect a product as possible. That is the duty of every first class dairyman.

Mr. Waterstreet: Have you ever practiced feeding whey to calves?

Mrs. Howie: I never had that inclination, because I have the feeling that the caseine had been removed, and that we wanted the bone and muscle forming element in our feed. We never have taken milk to a cheese factory and we have a hand separator for the farm, so that we feed direct from that. I do not know anything about its value as a calf food. I do know that I should be very careful about the cleanliness of the dish that I fed it from. Do not offer a nice sweet healthy calf an old swill pail to drink from. You would not like it yourself; put a few of the precepts of the Golden Rule into your work.

Prof. Woll: Would you be kind enough to explain to us in regard to your method of keeping track of the product from the different cows?

Mrs. Howie: We have a milking sheet and as soon as a cow is milked, the amount is put opposite her name. We used to test very often, but are now pretty familiar with our cows' work; we know the per cent. of butter fat that every cow in the herd gives, so that we can estimate very carefully at the end of the year whether she has been a profitable worker or not.

Mr. Michels: What difference do you find in a herd, how many pounds of butter per year?

Mrs. Howie: Oh, there is quite a range of course, when you once set a standard for your cattle, they must produce according to that. Every dairyman should make up his mind what he wants his cattle to produce, and not let them go back.

Mr. Michels: What is your present standard?

Mrs. Howie: About 5,000 pounds of 5 per cent. milk, that will keep a cow in the herd. We do not object to one that will give 10,000 pounds at 5 per cent., nor do we object to one that will give 7,000 pounds of 6 or 8 per cent. milk.

Mr. Michels: Would you keep a cow that would give 250 pounds of butter?

Mrs. Howie: Yes, I would until I could get a better one. I would keep them and keep breeding up, I would start down and breed up. It is a beautiful life work if we choose it, something new develops every year in this business and by those very methods we become scientific and interested in our work and it brings it up on a par with any profession in the land.

Prof. Woll: In regard to drying up cows before freshening, how long a time do you allow?

Mrs. Howie: The heifer with her first calf should milk as long as possible, right up to the second freshening, if I could, because she is now on probation, we are trying her, she is only half a cow and is serving her apprenticeship in the herd, we are preparing her for ten or twelve years of good, straight work, so we would prolong the milking period as long as possible. Before she freshens the second time I would dry her for at least

two months, then when she freshens you may have a little cow that you can bank on; she may not do as well the second year as she has the first, but you have given her a good, hard year's work, now let her rest up a bit, and then when she comes in, she stands in your stall a profitable producer, a credit to any dairy farmer or breeder.

Mr. Waterstreet: What breed do you prefer?

Mrs. Howie: The breed that will make the most butter and the best butter. I told you I was only in the kindergarten and I am not supposed to know all these things. I myself keep the Jerseys; they say they are a woman's cow, there may be other breeds equally as good, but I have become very much attached to this breed of cattle and I have no wish to change.

Mr. Schultz: In testing the cows regularly, do you find any great variations in the tests?

Mrs. Howie: Oh, yes, frequently. It is just as with people, sometimes you can do a good big day's work, and then again you fall off a little.

The Chairman: After listening to this very interesting address, you will all agree with me that Mr. Baer made a very wise and good selection in asking Mrs. Howie to come and speak to us and it is a strange thing and shows that we are only in the kindergarten ourselves, that we waited eleven years before we had any one with us to enlighten us on this subject.

WILL THE ACIDIMETER REPLACE THE RENNET AND HOT IRON TESTS IN CHEESE MAKING?

H. H. Dean, B. S. A., Guelph, Canada.

To test things is the itching desire of mankind. The small boy at this time of year tests the ice, to see whether or no it will bear his weight. Sometimes he tests the ice with stones, as may be seen nearly every day in early winter by the number of stones upon the frozen river near my home. Sometimes he

tests the ice with his own weight, and tumbles in. Then he has to be fished out by some one. A reliable and safe tester is essential in all kinds of testing.

The nose, and taste were the first testers used by cheesemakers to ascertain the acidity (sourness) of the milk. They are still used by some, but may not always be depended upon for reliability. Sometimes the cheesemaker tumbles into trouble as a result of these tests. In order to get a more reliable test for this purpose, the late J. B. Harris devised a rennet test, which consisted of a teaspoonful of rennet added to milk at a temperature of 86°, and then the time required for coagulation of the milk was noted. This test is based on the assumption that if the temperature of milk and the quantity of milk and rennet be the same, any difference in time required for coagulation of samples of milk must be due to the acidity of the milk.. As tea spoons and cups vary considerably in size, and are difficult to measure with accurately, more reliable tests, such as, "the dram test," in which one dram of rennet extract is used with eight ounces of milk at 86°; the Monrad, and the Marschall tests, have been devised. These are all great improvements on the "cup and spoon" test, but it is a question whether these rennet tests for determining the acidity of milk are based upon truth, or science. In looking over our data, collected during the past two years, upon this point, I do not find that the rennet test and acidity of milk always agree. For example, on April 26th, 1901, the rennet test of a vat of milk was 16 seconds, using the dram test, and the acidity was .189. On May 6th, the rennet test was 17 seconds and the acidity .171. August 26th, the rennet test was 22 seconds, and the acidity .171 also. On May 13th, a rennet test of 22 seconds gave an acidity of .162; and on the 20th, a sample with a rennet test of 24 seconds showed an acidity of .162. June 2nd, the tests were respectively 24, and .171; while on Oct. 19th, of the same year, a vat with a rennet test of 27 seconds showed an acidity of .171. The average rennet test of nineteen vats from April to October, 1901, was 22.1 seconds; while the average acidity was .167. We expect a high rennet test and low

acidity to go together; but our results do not show this to be always so. On the other hand, a high aciditiy and a low rennet test, i. e., small number of seconds required in coagulating, should go together; but it is not always the case.

One of the instructors relates the following incident, which occurred in a factory during the past season: The cheesemaker was testing a vat of milk with the dram rennet test, and it was "coming down" one or two seconds at every test; but the acidimeter as used by the instructor showed no change whatever in the acidity of the milk. The cheesemaker thought the vat was ready to set, according to the rennet test, and the rennet was accordingly added. The curd remained in the whey four hours; or. in other words, the vat was "set" too soon, as indicated by the acidimeter.

Before going farther, allow me to say that the term acidimeter or acidometer is to be preferred to the term "alkaline test," "acid test," etc., which are sometimes used when speaking of a measure for the acidity of milk, whey, etc.

During the past season, we have sought to find the relation between the acidity of milk and curd (or rather the whey from curd at the stages in cheesemaking known as setting, dipping, milling, and salting. The average of four months (July to October) was as follows:

Setting	.21
Dipping	.198
Milling	.84
Salting	1.07

In a few trials, where tests were made to compare the effect of salting on the acidity of curd, we found the following relations to exist, but the point needs further investigation:

Acidity of curds at salting	.98
Acidity of curds ½ hour after salting	.81
Acidity of curds 1 hour after salting	.94

From these preliminery tests, it would appear that the effect of salt is to decrease the acidity of a curd at first, but

that it increases at the time of "dressing" to nearly the same point as it stood when salted. These results differ from those obtained by Lloyd in England. He states: "This experiment proves beyond doubt that salt does not stop nor retard the formation of acid in the curd."

THE HOT IRON TEST.

Up to the present, we have been discussing rennet tests and the acidimeter, but have said nothing about the other test which cheesemakers use so largely, viz., the hot iron test. This test is said to be the result of an accident, and it has continued to be an accidental test ever since it was used in cheese making. By this, I mean that a cheesemaker may accidentally, or otherwise, get the results he is looking for by basing his judgment on the hot iron test; but he is never sure of his results. After years of practice, a man may be able to use the hot iron test with fair success; but it is more often good judgment than the hot iron test. However, the cheesemaker, like the small boy on the bank of the river, must use some sort of a test; and he thinks the hot iron will help him. It is something like putting hot horse-shoes into cream to drive the witches from the frothy mass which will not make butter. So far as can be seen by the speaker, the hot iron test is not based upon truth or science; hence must pass away as a result of the flood of incoming truth, which enlightens the cheesemaker of the twentieth century. It has served its day. It has been helpful to the maker in guiding his judgment; but unreliable tests may not be used in modern cheeseries. The thermometer has taken the place of the finger, as a mans of testing temperature; so the acidimeter must replace the rennet and hot iron tsts for determining the acidity of milk and curd at the various stages of cheesemaking.

HOW TO USE THE ACIDIMETER.

The alkaline solution should be of such strength that when 10 cubic centimeters of milk or whey are used the percentage of acid is represented exactly by the number of cubic centi-

meters and tenths of a c. c. of alkali used to neutralize the acid. We use Phenol as the indicator. This saves mathematical calculations, and is very much less trouble. We have found a solution much more convenient than any form of tablets, although the solution is objectionable on the ground of expense, and danger of breaking when shipping. We have not found any trouble by the solution losing strength, if kept in tightly stoppered bottles.

The change of color when the acid of the milk or whey is neutralized is familiar to most cheese and butter makers. A permanent pink shade is correct.

ADVANTAGES OF THE ACIDIMETER.

The acidimeter is preferable to the rennet and hot iron tests for the following reasons:

1. It takes less time to make a test.
2. It wastes less milk and curd.
3. There is less danger of error in making a test, as temperature, time, "length of string," etc., do not have to be taken into consideration.
4. The danger from too much or too little acid in the milk and on the curd is materially reduced, as the acidimeter *measures acid.*
5. Acidy cheese may be guarded against by using the acidimeter at or near salting time.
6. A better quality of cheese will result.

In answer to the question:

"Will the acidimeter replace the rennet and hot iron tests in cheesemaking?" would say that, in my judgment, it will, in the very near future. Rennet tests and hot irons will soon be unnecessary in the appliances of a cheesery.

However, cheesemakers should go slowly and not make any radical change before becoming familiar with the acidimeter, but when it is once understood, they will not wish to go back to the tests which helped them to *guess* the truth, but will prefer the test which is based on truth itself.

DISCUSSION.

Mr. Waterstreet: I would like to ask the Professor how he tests whey two hours after the whey is drawn?

Prof. Dean: There is always more or less whey coming from the curd and if we wish to make tests in the factory we use a vat that has a tap, and we simply allow enough whey to collect to make a test, because it only takes a little to make a test, and we simply collect the whey in the vat, wherever we have the curd, enough to make a test. During this past year two of our instructors on the road have carried acidimeters with them and have shown cheesemakers how to use them, and I visited these factories along with the instructors and the men say they would not go back to the hot iron test in cheese making. That is the practical experience of factorymen who have used the acidimeters, replacing more especially the hot iron. I can understand why a cheesemaker would not wish to do away with the rennet test, he can use that all right, but I think that every cheesemaker and every man who has ever given any study to the question at all, must have felt that the hot iron was not based on anything that was scientific, that there was too much guessing about it and he must have felt it was a question of a man's judgment largely, and the hot iron test I am satisfied must pass away in modern cheesemaking, and the rennet test will also be superseded, just as soon as cheesemakers become familiar with the acidimeter.

We have also been making some experiments this past season with reference to heating up some curds that were a little bit too fast. Fortunately, or unfortunately, we did not have very many of those this past year, but when we found the curd was working a little too fast, not likely to get properly cooked, we heated them to 110 degrees. I am not going to advise this, but in the very few experiments we made we found it worked satisfactorily. First working the curd, running them up to 110, that seems to check the development of the acid and the curds get properly cooked, but I would not advise that until we had made some further investigation.

Mr. Aderhold: I want to ask Prof. Dean if he has any explanation for the variation in the acid shown by the acidimeter? Or the variation in the relation in the acid shown in the two tests of milk, the rennet test and the acidimeter test?

Prof. Dean: My explanation is that it is a point yet that needs further investigation, but I do not think that the rennet test always shows the acidity of the milk; that rennet test, when you have the temperature and quantity of rennet and quantity of milk the same, it is assumed that the rennet test indicates the acidity of the milk. If there is any variation in the number of seconds required for coagulation it is due to difference in the acidity. That may be true and may not be true; my own judgment is that I am very doubtful whether all conditions that are found in the time of coagulation are due entirely to acidity. My judgment is that the rennet test is based on a wrong assumption, although I may be wrong in that point.

Mr. Aderhold: I would like to ask Prof. Dean if there is more than one kind of acid that enters into this question. Is it only lactic acid that we have to deal with, or are there other acids in the milk that we do not care anything about perhaps, or do not cut any figure, or do they cut some figure, if there are any other acids?

Prof. Dean: There are undoubtedly a large number of acids, and the acidimeter is based on the assumption that all the acid in the milk is lactic acid. I do not think that is true, I think in cheese making we are safe in assuming that the chief acid, most concerning the cheesemaker, is the lactic acid; while others may be present, they play an insignificant part in cheesemaking.

Mr. Aderhold: Would not your acidimeter show those other acids? And the rennet test might not show them.

Prof. Dean: The acidimeter of course would give you the percentage of acids of all kinds contained in the milk. I say, the other acids that are not lactic acid are so insignificant and play so small a part in cheesemaking that for practical purposes they may be disregarded.

Mr. Mason: I would like to ask Prof. Dean how he can get a solution to make that test with.

Prof. Dean: I do not how you do here. In our case, our chemical laboratory supplies it to the cheesemakers at cost price. If a cheesemaker wants a half gallon or a gallon of solution, he writes to the chemical laboratory and they put up the solution and send it to him at cost price.

Mr. Mason: Could we get it prepared at the druggist's here?

Prof. Dean: I am not familiar enough with your conditions. I think there are no druggists here who would be able to make the solution sufficiently accurate. I do not know about that. I will say that tablets have been used to some extent, but we find this difficulty, not with people who are more familiar with it, but our cheesemakers say it takes too long to dissolve the tablets and there is too much waste. You may dissolve a dozen, or whatever you think may be needed, and if you use only a part of that solution, the rest of it will be lost, as the solution seems to lose strength soon after dissolved. Hence we have adopted the solution entirely in our work and find the boys take to it much more kindly, they are much less troubled in making it. I think the laboratory puts it up in half gallons for about one dollar.

Mr. Waterstreet: How long would that amount last a cheesemaker?

Prof. Dean: It would depend on how much he used of it. Only a small amount is used, and a gallon of solution perhaps would be all that an ordinary factory would require during a season. It depends on the number of vats he is testing and how careful he is of the solution.

The Chairman (Mr. McKinnon) then called to the platform Mr. Ben Dally, of Milwaukee, who, on behalf of the Association, presented to the out-going President, Mr. W. C. Dickson, a gold watch and scarf pin.

Mr. Dickson, in thanking the Association, said:

This is not the only token of kindness that I have received at your hands. For three consecutive years you have honored

me by electing me president of this Association. I appreciate these gifts very much, because it proves to me conclusively the good fellowship that exists between your Ex-President and yourselves; this is the feature that pleases me the most and I shall always wear this watch as long as I live and if my son lives to wear it after me, I hope he will wear it with the respect due to the Wisconsin Cheesemakers.

I learned not long ago a little verse which I cannot help quoting to you now, it runs something like this:

When we come into this world from the Lord knows where,
We travel through the world with sorrows and care
When we leave the world it is for the Lord knows where,
But if we are good fellows here, we will be good fellows there.

Convention adjourned till 2 P. M.

AFTERNOON SESSION.

Friday, Jan. 9, 1903.

President Dickson in the Chair.

SWISS CHEESE MAKING; METHODS OF MANUFACTURING.

Fred Marty, Madison, Wis.

Mr. President, Ladies and Gentlemen:

To many of you the manufacture of Swiss cheese may not be known. But you will find on the map showing the location and distribution of creameries and cheese factories in Wisconsin, a cluster of red dots, which is called Green county and is the home of the manufacture of Swiss cheese, where many of your cheesemakers are struggling with the difficulties of Swiss cheese making. So that you will see we are doing our share towards the cheese industry of the state. To you it may ap-

pear that our small number that has so far been taking part in your convention, that we probably have not any difficulties to contend with; but I can assure you we have them too, the same as your Cheddar cheesemakers and I think it would be a great benefit to us if we would come here and bring up different ideas, as an ideal Swiss cheese has many details, and is made very defective under different temperatures, in the curing process. Therefore we could bring up many important points for discussion.

I think I am safe to say that it requires skill and good judgment, yes years of practical experience to be a successful Swiss cheesemaker—I mean to say under our present conditions as we have no guide to go by, as you Cheddar cheesemakers have.

I will try and explain to you in a few words the manufacture of Swiss cheese. It may not be known to all of you that a Swiss cheese is a sweet curd cheese; the temperature of the milk when set varies from 90 to 96 degrees F. When the milk has become curdled it is cut now mostly with the wire harp; sufficient time is given for the whey to expel from the curd before cooking.. The heat is applied gradually. The time required to cook should not be less than 25 to 30 minutes. The time varies from 40 to 45 minutes; also the time after the cooking for firming varies greatly. After the curd is sufficiently firmed it is then left to settle. I just want to state that our curd is not left to mat; but is under a continual stirring from time of cutting. The curd is then dipped from the whey all in one body no matter if the cheese weighs 50 or 200 lbs. and put to press in one lump where the cheese is turned every two hours during the day and is kept under continuous pressure for 24 hours. From the press the cheese is put into a tank containing brine strong enough to float it and remains there until sufficient salt has been absorbed—from 2 to 3 days, depending on the size of the cheese. The cheese is then placed on the shelf to cure, under continuous dry salting. The cheese is taken from the shelf every other day, turned, washed and salted, for at least two months before our cheese are put on the market. So you will see that the Swiss is a cheese of long

process and careful attention must be paid during the curing process Swiss cheese is classed in three grades; a No. 1 greatly depends on the eyes or holes; they must be equally distributed throughout the body of the cheese; if the eyes are not many and glossy it indicates good flavor and texture. Glaesler and Gasy cheese are classed as No. 2, and Nissler (a pinholey) cheese, to No. 3. Strange to say a great deal of our No. 2 cheese, called Glaessler's, is a cheese with a pasty texture, the body containing seams running throughout the cheese and when cut will break along these seams, the flavor being good,—somewhat of a sweet taste. This is made out of the very best or sweetest milk, yet it is beyond the control of our best cheesemakers to prevent this condition although we can prevent its action some; but don't know when we are treating the curd just right, and generally becomes known to us after a number of cheese are made. Now for instance in the fall of the year when we receive the milk in very sweet condition, as a rule we set the milk immediately after receiving at the factory. If the temperature of the milk is not raised it will cause the rennet to act slow upon the milk, and the whey will not expel from the curd and if not sufficient time is given before the cooking, you cannot get a good cook on the curd, which will make a pasty textured cheese. In the first place the milk was not ripe enough, or did not contain sufficient acid to produce the proper fermentation necessary to develop the eyes or holes in the cheese. Therefore I think we should have some method to go by—I mean a way to ripen the milk. This would, in my opinion, help us a great deal in the difficulties which we have in the curing process. Now in regard to over-ripe milk, which we occasionally get in mid summer to which too large an amount of rennet is often added; and as the rennet we use is home made, it is not of a uniform strength and very often too strong or too old a rennet is used. Some cheesemakers use three jars of rennet which will make the rennet used about 34 hours old, instead of using two jars 21 hours old. This may be very often the cause of our cheese not being uniform. I mean to say we could help

this a great deal if we could test the strength of the rennet and then add a sufficient amount of rennet according to the ripeness of the milk. An experienced cheesemaker may control this some by good judgment, but take a beginner who has not yet learned these details and he is often troubled by cheese with the eyes not equally distributed and often with too many holes or not enough.

The origin of such cheese can be traced back to the too early setting of the milk or the use of old rennet. We have but little control, over this as the temperature in our curing rooms varies from 65 to 75 degrees. We cannot check its action very much by heavy salting as such cheese do not absorb much salt. So under these conditions fermentation will set in very rapidly and too many eyes will develop.

With reference to this point of ripening or maturing milk, I can say that I have had good results in previous years, in the fall of the year, by taking the first milk I received at the factory and heated it up to the setting point and kept at that temperature until all the milk was in. Now, I did not hurry the setting of the milk and as I have a steam kettle I could hold the milk at just the desired temperature. This I think caused the milk to ripen some and my cheese turned out better than when set too sweet. In regard to determining the fermentation or maturing I think the application of the rennet test would aid us in making a more uniform cheese and if we can ever determine the point to which our milk should be ripened, a commercial rennet extract can be used.

In conclusion I will say that this particular point of getting ways and means to control the ripeness of the milk and strength of the rennet at the time of setting the milk will aid us greatly.

The application of scientific tests along these lines has in the manufacture of Cheddar cheese worked wonders, and I am at a loss to see why the results would not be the same in our branch of cheese manufacturing. Let us try it!

DISCUSSION.

Mr. Michels: I would like to know if you do not have facilities at hand at the Dairy School to find out what degree of ripeness your milk ought to have.

Mr. Marty: Well, we have, we tried all those experiments in the winter time, but we have no good results so far whatever, as our milk in the first place contained too much acid for Swiss cheese making and we cannot carry on experiments during the winter. I think it should be done during the summer season and we would keep track of the ripeness of our milk and see how our cheese worked according to the degree of ripeness, I think it would only take one summer's work in order to get at the correct point of ripening the milk.

Mr. Waterstreet: Do you use a starter in Swiss cheese making?

Mr. Marty: Well, we may call it a starter, and we may not call it a starter, I think, the cheese that I made so far, that I used a starter or culture. But I do not think Swiss cheesemakers know that they are using a starter. They tell me that Swiss cheese cannot be made with rennet extract, and I would like to ask any experienced cheesemaker in this line of work why we cannot use a commercial rennet extract—if they want a home made rennet I should call that a starter—in order to ripen our milk. But in answering your question, I would say that the rennet we use is certainly a starter, but, as I stated in my paper, that is all the way from 21 to 34 hours old, and as far as my knowledge goes, I should call that a starter that we add to the milk.

Mr. Waterstreet: Do you never have any acid on the curd when you draw the whey from it?

Mr. Marty: No, our milk being so sweet, and the high temperature which we give our cheese curds, there being no acid developed in the curds. At a temperature of 130 there is no acid developed in the curd,—am I right on that point?

Prof. Dean: Very little at that temperature.

Mr. Waterstreet: Supposing you get in overripe milk, what would you do then?

Mr. Marty: We have no control whatever, that is beyond our control. The only way we have to work our cheese with overripe milk is to hurry the process along and get the cheese out of the whey just as soon as possible; we have nothing to check its action whatever.

A Member: What liquid do you use to set your rennet?

Mr. Marty: The way I set my rennet, I may say that I use two-thirds whey and one-third water, that is the way I set my rennet. I like to hold the rennet at as low a temperature as possible in order not to get it too strong. I should like to hold it at a temperature of 70 degrees.

Mr. Aderhold: Do you add salt to that?

Mr. Marty: I add a little salt.

Mr. De Haan: I would like to ask if they use a curd mill for that cheese.

Mr. Marty: No, we do not. The curd is, as I stated, continually stirred in the kettle, we do not leave our curd to mat at all until the curd is settled in the whey. When the curd is settled, we dip our curd from the whey, instead of the whey from the curd, we dip the curd out of the kettle in one body, and take it right to the press.

A Member: I would like to ask how heavy a pressure he would consider about the right pressure for a Swiss cheese.

Mr. Marty: I should call that a very difficult question, and I believe I will leave it to you. I was brought up among the cheese factories in Green county. With the presses we have there, there are large beams running across the cheese room, and I never figured that pressure, but I would say that it was a very heavy press, and I can say that I used half of that pressure in my cheese making. I use a very small pressure on a Swiss cheese. If the cheese is in good condition, and the milk has been normal, the curd has worked all right, the whey will expel from the curd with a very light pressure. If the curd is gasy, the heavier the pressure the more whey you can get out of

curd. I could not tell you the right weight, as I have never figured out the pressure.

The President called the attention of the members to the fact that when a member of the association exhibited cheese and received the first premium therefor, that the cheese, according to the by-laws of the Association, then becomes the property of the organization. He stated that this provision of the by-laws had been violated by one of the exhibitors and expressed the hope that it would not occur again.

HOW TO PAY FOR MILK AT CHEESE FACTORIES.

H. Anderson, Sheboygan Falls, Wis.

When we buy milk for cheese one of the first questions to consider should be how to pay for the raw material, to do justice to all patrons. This question can therefore be said to belong to the primary in cheese making.

In a general way it can be said that the milk should be paid paid for according to the commercial value of the finished product obtained from milk of different qualities.

The condition of the milk taken in, is to a certain extent nfluencing the quality as well as the quantity of cheese. A low testing milk in good condition is worth more per 100 pounds than milk of a higher test in poor condition. Yet, in the following I am going to omit this phase of the question and consider only the fat and casein, the two solids in milk, which together with water make up the bulk of the cheese.

The amount of casein in milk is running very constant, and I am not far from the truth when I make the statement that it is present in the same per cent. in 3 per cent. fat milk as in 4 per cent. milk, which I shall prove later on.

At the same time, the per cent. of fat varies very much, say from 2 per cent. to 7 per cent., and it is in consequence of these facts that we can figure out the yield when we know the per cent. of fat. We must, therefore, first of all, find out the amount

of fat in the milk, and to accomplish this we use the Babcock test.

The Babcock test should be used in every cheese factory, if not for any other reason, to guard against watering or skimming of the milk and to know what kind of milk is delivered. Up to the time when this invention was made, milk was paid for by weight, but as by this system the low testing milk gets the same price as the higher testing milk, it is a discrimination against the rich milk and a premium on the poor milk. When, however, the patrons keep the same breed of cows and have all their cows coming in fresh about the same time, with no winter dairying, the system works fairly well.

When the Babcock test was introduced in our cheese factories, then as now, we were told to pay for milk *straight* according to the per cent. of fat. Then some of our most prominent factorymen started to do so, but after the first season had passed a lot of patrons went kicking and said: "Now, Mr. Cheesemaker, we are not satisfied with this way of paying for milk; we think it is unjust, as when our neighbors with 4 per cent. milk have received $1.00 per 100, we with 3 per cent. milk have only received 75 cents, and we know there is no such difference in yield as that." The cheesemaker only said that he was supposed to know more about his business than the farmers and that he was going to stick to the new system, and so they said good-bye. After one or two seasons more the factoryman lost so many patrons that he made up his mind that he either had to give up that way of paying for milk or quit the factory, and as he could not afford to leave the factory, he left the system and went back to the old way of paying—by weight—everybody alike, and that is what he is doing today.

Who is to blame? In the first place, the cheesemaker did not apply the test right, and he was further wrong in trying to force a new system on his patrons against their wishes.

We must remember that the factorymen as a rule do not buy the milk; they simply agree with the farmers to make up their milk into cheese for so much per pound of cheese. The cheese as well as the milk belongs to the farmers and in one

way it does not make much difference to the factoryman how the farmers divide the receipts, but of course he should try to educate the patrons and make them see the advantage in needed improvements.

CONDITIONS.

To make the straight test system work just and right, one of two conditions has to exist. We either have to get yield in proportion to the butter fat, or, if we do not, the yield we do get from richer milk, should sell for more money per pound than that made from lower testing milk, to make up for the lack in proportionate amount. But neither of these conditions exist.

A proportionate yield is claimed by very few nowadays. The general experience in our own state goes to prove that we do not get yield in proportion to butter fat. The reports from 350 former Dairy School students show that the average yield for the season was 2.63 pounds of cheese to one pound of fat; in 4 per cent. milk, 2.50, and in 3 per cent. milk, 2.95 to one pound of fat.

Theoretically the same can be proved from analysis of milk. The following table, which represents the average figures from 140,000 analyses of milk from different breeds, shows the constancy in amount of protein compound, and that in the two extremes, the Jersey with 5.21 fat and the Holsten with 2.88 fat, the casein (or protein) is the same, 3.99 per cent.

	Durham	Ayrshire,	Holstein.	Jersey.	Am grades.	Com. natives.	Average.
Fat	4.04	3.89	2.88	5.21	4.01	3.69	3.50
Sugar	4 31	4.41	4.33	4 52	4.36	4 35	4.30
Proteides	4 17	4.01	3.99	3.99	4 06	4 09	4.00
Salts	0.73	0.73	0.74	0.71	0.74	0 73	0 73
Water	86.72	87 96	88 06	85 57	86.83	84.14	87.47

We must therefore admit that a pound of fat in 3 per cent. milk is worth more to us than a pound of fat in 4 per cent. milk.

Others do not go as far as to claim a proportionate yield,

but they say cheese made from richer milk sells for more money per pound than cheese made from lower testing milk. There is no buyer who could or would buy cheese according to its per cent. of fat. It would be *impracticable,* and even if it were practicable, I doubt if it would be *just* because the *making of cheese* has more to do with its quality than the amount of fat. A very fine cheese can be made from 3 per cent. milk and a very poor cheese may be made from 4 per cent. milk.

It is said that the eating is the best proof of a good pudding, and I will apply this on the conditions in Sheboygan county. People like to eat Sheboygan county cheese, and for that reason they pay a high price for it; but if you suppose this is because it is made from extremely rich milk, you are mistaken. There are more Holstein cows in Sheboygan county than any other breed and there are many factories whose milk product in the flush of the season tests only 3 per cent.

Comparison is made between full cream cheese and skim cheese and the skim cheese from 100 pounds of milk, valued at say 5 cents and that of full cream at $1.00, but we must compare full cream cheese made from different per cent. whole milk.

The market quotations on full cream cheese are also referred to with the claim that the range in prices and ascribe the same to the per cent. of fat.

The cheesemaker is supposed to know how to make a good cheese, but once in a while when he thinks he makes a good cheese, he makes a poor one. The day is "off" and somthing goes wrong in flavor or acidity, or both, and he has an off-flavored and acidy cheese, which the buyer will cut in price say five cents a pound. The amount of fat in such cheese cuts no figure.

The *casein system* (the fat + 2) is an improvement and a step in the right direction; but if we intend to pay by the yield, we should add 3 to the fat instead of 2, as 3 represents the solids in cheese, except fat. *Three per cent.* milk is supposed to give say 9 pounds of cheese, and that the cheese contains at a rough estimate, 1-3 per cent. water.

Example.—Fat, 3 pounds; casein, 3 pounds, and water, 3 pounds = 9 pounds. *Four per cent. milk* would be like this: Fat, 4 pounds; casein, 3 pounds; water, 3 pounds, and 10 per cent. water to that extra pound of fat, 0.10 = 10.10.

The yield can also be found by adding 10 per cent. to the fat for water and then add 5.7. Example.—Three per cent. milk: Fat, 3 pounds 0.3 × 5.7 = 9.

Two years ago I started with a system of my own, which is practical, easy, and works right under present conditions. I find the average test and the average price per 100 of milk. Then when the selling price of cheese does not exceed 10 cents, I add one cent to the average price for every 1–10 of 1 per cent. fat above and take one cent off for every 1–10 of 1 per cent. fat below the average test, making 10 cents difference in price of 3 and 4 per cent. milk. For every one cent increase in the selling price of cheese, I may add one cent to the 10.

Example.—Selling price of cheese, 10c; less making, 1½c, = 8½. Increase in yield from 4 per cent. milk above 3 per cent. milk, say, 1.15 pounds, and 1.15 pounds cheese at 8½c = 9.8c.

It may be said that 10 cents is not enough for a pound of butter fat.The whole question with me is what it is worth to me when I make it into cheese. If any patron asks for more than his just share, I have no right to take from the other patrons to satisfy him. But that is what I would have to do if I sell that extra one pound in yield for 10 cents and pay that farmer say, 25 cents for it; the difference would be 15 cents which I had to take from his neighbors. I will close by giving this advice to my fellow cheese-makers: Find the per cent. of fat in milk, figure out the approximate yield and pay for milk according to that. It is the only right way under existing conditions.

Mr. Baer: Mr. President, I have a letter of greeting from former Governor W. D. Hoard, who is at present in quest of health in far-off Texas; also two letters of invitation which I desire to read at this time.

The Chairman: The secretary will please read the letters. The following letters were then read by Secretary Baer.

Hotel Orndorff,
El Paso, Texas, Jan. 5 ,1903.

Mr. U. S. Baer,
Madison,. Wis.

My Dear Baer:—Your kind invitation to attend the Wisconsin Cheese Makers' Convention, the 7th, 8th and 9th, has been sent me here by my son. I wish I could be with you, and right glad would I be to add to the value or zest of the meeting. I am here with Mrs. Hoard in quest of renewed health for both, and I think the climate is doing us good.

I hope you will have a splendid meeting and do much good. Don't forget to bend a goodly part of the energies of your organization towards influencing the cheese factory patron. He is the constant heavy weight that holds back progress. There is constant danger in such organizations as yours, that you will cut loose from your base of supplies. You cannot go any faster than the slowest team in the procession, no matter how much you may discuss and resolve Therefore, let me suggest that a great part of your effort be to devise some means whereby the patrons may be stimulated to better effort in the production of good milk. The Canadian people have finally come to the belief that the best plan is to divide the territory off into districts of twenty-five factories, and over each district put an inspector who shall devote his whole time to producing uniform excellency in the work of the factories and an increase of intelligence with the farmers in the economic handling of their cows.

Don't forget that your future hangs on the proposition of making the business of cheese making as profitble to the patron as it can be. He is ignorant and does not see the way. Use your organiaztion to show him the way. Success to you.

Yours very sincerely,

W. D. Hoard.

MILWAUKEE, Jan. 9, 1903.

To the Wisconsin Cheese Makers' Association,

In Convention.

GENTLEMEN:—As Mayor of Milwaukee, I take pleasure in asking your splendid organization to again honor us with your presence in our city a year from now. I know that I speak for all our people when I say that we are always pleased to have you meet with us. We appreciate the compliment you have paid us by meeting here two times in succession and trust that you have been so well pleased with your sessions here that you willl unanimously vote to return in 1903.

Very respectfully,

DAVID S. ROSE,

Mayor.

MILWAUKEE, Jan. 9, 1903.

To the Officers and Members of the Wisconsin Cheese Makers' Association,

In Convention.

GENTLEMEN:—The Citizens' Busines League takes great pleasure in extending you a renewal of its formr invitations and asks you to hold your next annual convention in this city. It has been a source of gratification to us to know that your two meetings held here have been so largely attended and so successful in every respect. We think they have thoroughly demonstrated the wisdom of meetng here and sincerely trust you will vote to come again

We assure you that your reception will be always cordial and that every courtesy will be tendered which will contribute to make your meetings successful from a business standpoint and pleasant from a social standpoint.

Wishing you continued prosperity, we remain,

Yours truly,

CITIZENS BUSINESS LEAGUE,

By R .B. Watrous,

Secretary.

The Chairman: We will now continue with the business of the association as per the program.

EXPERIENCE OF PAST SEASON IN CHEESE MAKING.

W. H. Short, Chili, Wis.

In the spring of the year, about April 1, when most of our factories of Clark, Wood and Taylor counties started, I found that our milk producer, the cow, had been poorly wintered, robbed of the food that the market's high prices took from her feed box. This caused her milk flow to be very low, and quite often in very poor condition for making cheese. The shortage of feed caused quite a few of our farmers to take and feed such roots from their cellars as would not be suited for table use, and in many instances these roots would leave their unwelcome flavor in the cheese.

A little later these difficulties disappeared, only to give space for more, when the cow was turned out to pastures that were still partly wild and produced many weeds that would cause bad flavor in the milk.

How did I handle this milk– Not at all, if I could detect it at the intake, where I think the successful cheese maker does his work. If I found a can of milk containing a bad flavor, I would inquire for the cause in a pleasant way, and if I found it, would explain the results and co-operate with the farmer in trying to do away with his enemy.

In this way, I find the farmers more interested in bettering the quality of my cheese than if I should simply say: "I don't want your milk; it has bad flavors."

This being the first season in cheese making in my locality, I found each day that it was my duty to explain to some farmer our methods of manufacture; how to care for the milk at his home; how his milk tested, and why it was lower than his neighbor's; why I did not know the cause of its varying from week

to week; how the money was divided, and a hundred other things that the farmer should know to co-operate with the cheese maker in a way that will make his business a success.

BENEFITS OTHER THAN MONEY.

Having been a butter maker for several years, I could notice more than the ordinary beginner in cheese making the benefits other than money derived from it.

I found that a man, by noticing the workings of different lots of milk, can become an authority as to when and under what circumstances he may get a No. 1 quality of milk.

Perhaps I have left out too much about the work in the factory, but I will simply say that we made cheese under favorable circumstances in our part of the state. The only part of the season that we had any trouble was in the spring, as I have stated.

Of course, we had our off days. But only ordinary causes were at fault, and ordinry methods rectified them.

The weedy milk of the spring will soon be something of the past, as our improved farms produce excellent pastures each year, and the partly improved farms are being rapidly developed. The time is near at hand when we will be living in a country that cannot be beaten for the manufacturing of cheese.

We are now working on a sort of co-operative plan. All of our factories are making the fancy cream for Crosby & Meyers, who furnish an instructor who is an expert in the work. He visits each factory as often as he can make the rounds. If any cheese maker is in trouble he soon makes matters right.

In this way, I think we are giving better satisfaction to our patrons than if each one was independent of the other and at the same time trying to "do up" his neighbor.

The season was one of success to the cheese industry of Northern Wisconsin. The business nearly doubled from the year before. It was profitable to the cheesemaker, the farmer and to the localities in which it has grown to importance.

DISCUSSION.

Mr. Michels: I would like to ask what their method is of distributing the money,—how do you pay for milk?

Mr. Short: Well, we pay according to the test.

Mr. Michels: You mean, you take a certain charge off for making a pound.

Mr. Short: Yes, we are making by the pound; most of the factories around there are making for a cent and a quarter a pound.

Mr. Michels: What is your theory about the weight of those cheese that you speak of, those small cheeses: do you think you lose much in weight as compared with twin shapes?

Mr. Short: No, sir, I think we gain. The reason I think we gain is because the cheese are shipped, you may say, while they are green. The oldest cheese are only one to two weeks old, and in that way I think we gain.

Mr. Michels: You make them just ten pounds?

Mr. Short: Yes, they are supposed to be ten pounds when they are paraffined.

Mr. Aderhold: As a member of the committee on legislation, I just want to draw the atention of the members and the cheesemakers throughout the state to the fact that the association is going to try to get the legislature to give them a larger appropriation, and we have got to go to them and try to make them believe that we really are entitled to it; and you people who live scattered throughout the country, you want to do your share with your legislator, your assemblymen and senator from your district,—try to keep that always in mind. You will find by and by that there will be a bill introduced and you want to watch it and just write your representatives and keep pushing them up and get your neighbors to write them.

President Dickson: Before closing this session, gentlemen, I wish to thank you for the honorable manner in which you have all conducted yourselves, and the able manner in which you have assisted us in making this one of the best and greatest con-

ventions that we have ever had. I trust next year we will be able to double our number, and whether we are in Milwaukee, or wherever we may be, I hope to see all the familiar faces and as many more as we have had this year. Our business for this year is now over, and I declare this convention adjourned *sine die*.

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