Twelfth annual meeting of the Wisconsin Cheese Makers' Association held in the Convention Rooms, Republican House, Milwaukee, Wisconsin, Thursday and Friday, January 6, 7 and 8, 1904. 1904

Wisconsin Cheese Makers' Association
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TWELFTH ANNUAL MEETING

OF THE

WISCONSIN

CHEESE MAKERS' ASSOCIATION

HELD IN THE

Convention Rooms, Republican House, Milwaukee, Wisconsin, Wednesday, Thursday and Friday, January 6, 7 and 8, 1904.

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 COMPANY, STATE PRINTER.

1904.

LETTER OF TRANSMITTAL.

OFFICE OF THE SECRETARY,
WISCONSIN CHEESE MAKERS' ASSOCIATION,
MADISON, WIS., 1904.

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

I have the honor to submit the twelfth 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 6–8, 1904.

Respectfully submitted,

U. S. BAER,
Secretary.

OFFICERS, 1904

President:—

J. K. POWELL ..... Milwaukee, Wis.

Vice President:—

E. L. ADERHOLD ..... Neenah, Wis.

Directors:—

Three Years—F. J. KARLEN ..... Monroe, Wis.
Two Years—E. L. ADERHOLD ..... Neenah, Wis.
One Year—J. F. BACHMANN ..... Black Creek, Wis.

Treasurer:—

M. MICHELS ..... Garnet, Wis.

Secretary:—

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

TABLE OF CONTENTS.

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 unadulterated 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, 1904.

A.

Ahlswede, Charles	Manitowoc	Wisconsin
Austin, H. E.	Boscobel	Wisconsin
Austin, H. W.	Fennimore	Wisconsin
Adams, Charles	Wyoming	Wisconsin
Anderson, H.	Sheboygan Falls	Wisconsin
Armatage, H. M.	Rose Lawn	Wisconsin
Austin, W. A.	Spring Green	Wisconsin
Anderegg, Caspar	La Crosse	Wisconsin
Anderhold, E. L.	Neenah	Wisconsin
Achter, John	Chilton	Wisconsin
Alves, H. C.	Sheboygan Falls	Wisconsin
Alexander, C. B.	Chicago	Illinois

B.

Baer, U. S.	Madison	Wisconsin
Biddulph, J. R.	Providence	Illinois
Boies, A. F.	Marengo	Illinois
Bates, R. R.	Madison	Wisconsin
Bender, Fred	Richland Center	Wisconsin
Blood, F. J.	Chicago	Illinois
Buss, A. C.	Pella	Wisconsin
Benishek, Anton	Francis Creek	Wisconsin
Bachofen, H.	Monroe	Wisconsin
Blessig, L. W.	Mliwaukee	Wisconsin
Bachmann, J. F.	Black Creek	Wisconsin
Bast, H.	Gartnet	Wisconsin
Blanik, Louis	Kodan	Wisconsin
Bahr, C. A.	Howard's Grove	Wisconsin
Burkhotter, Alfred	Monroe	Wisconsin
Bennett, Andrew	Chippewa Falls	Wisconsin

Bergs, Joseph	Poniatowski	Wisconsin
Brehm, Henry G.	Brehm	Wisconsin
Bruhn, Axel	Spring Green	Wisconsin
Baker, R. E.	Manawa	Wisconsin
Basler, George F.	Calumet Harbor	Wisconsin
Berry, Everett	Richland Center	Wisconsin
Bamford, H. J.	Plymouth	Wisconsin
Barber, A. H.	Chicago	Illinois
Barr, George H., Prof.	Strathroy	Ontario
Boll, E. C.	Sheboygan	Wisconsin
East, Joseph	Stockbridge	Wisconsin
Bierbaum, Herman	Plymouth	Wisconsin
Brandt, August	Forestville	Wisconsin
Bolchen, Thomas	Mt. Ida	Wisconsin

C.

Cross, J. W.	Mauston	Wisconsin
Cook, Hon. S. A.	Neenah	Wisconsin
Clarson, John	Boscobel	Wisconsin
Curry, C. L.	Readstown	Wisconsin
Chaplin, H. A.	Plymouth	Wisconsin
Curtin, D. R.	Dundas	Wisconsin
Clark, W. E.	Weyauwega	Wisconsin
Conrad, R.	Haven	Wisconsin
Chaplin, Erle W.	Waldo	Wisconsin
Cannon, J. D.	New London	Wisconsin
Cannon, S. D.	Dale	Wisconsin
Cornish, O. B.	Fort Atkinson	Wisconsin

D.

De Haan, Matthew	Lineville	Iowa
Du Parc, Julien	Sidney	New York
Dassow, R. P.	Sheboygan Falls	Wisconsin
Dehard, A. D.	Sheboygan	Wisconsin
Deicher, Herman	Glenbeulah	Wisconsin
Dubois, D. L.	Wualhain	Wisconsin
Draheim, J. A.	Reedsville	Wisconsin
Douma, M. G.	Cleveland	Wisconsin
Decker, A. J.	Fond du Lac	Wisconsin
Damrow, O. A.	Sheboygan Falls	Wisconsin
Dodge, James	Sextonville	Wisconsin
Doudna, S. H.	Gillingham	Wisconsin
Dobbuatz, Louis	Milwaukee	Wisconsin

Duebner, O. C.	Timothy	Wisconsin
Durst, John W.	Dodgeville	Wisconsin
Durst, Henry	Keysville	Wisconsin

E.

Elling, W. J.	Dana	Iowa
Ehuron, J. J.	Oconomowoc	Wisconsin
Eguaszak, J. J.	Pulaski	Wisconsin
Erbstoeszer, Edward	Sheboygan	Wisconsin
Ellfson, Henry	Spring Green	Wisconsin
Erb, Jacob	Mt. Horeb	Wisconsin
Erdman, A. B.	Nero	Wisconsin
Emery, J. Q., Prof.	Madison	Wisconsin
Erdman, William	Erdman	Wisconsin

F.

Fulmer, F. B.	Ettrich	Wisconsin
Fennimore, John	Middlestrum	Netherlands
Fero, Walter	Stanley	Wisconsin
Ferrington, E. S.	Greenleaf	Wisconsin
Falk, Emil	Waldo	Wisconsin
Fassbender, Henry	Appleton	Wisconsin
Freund, Otto	Marshfield	Wisconsin
Fassbender, Hubert	Greenville	Wisconsin
Fisher, Charles	Shiocton	Wisconsin
Falck, Louis	Morristown	Wisconsin
Fredrich, H. A.	Shawano	Wisconsin
Fokett, Albert	Reedsville	Wisconsin
Fokett, C. J.	Reedsville	Wisconsin

G.

Ganschow, R. C.	Bonduel	Wisconsin
Gates, C. N.	Milwaukee	Wisconsin
Groves, Oscar	Viola	Wisconsin
Grotemont, John	Bullion	Wisconsin
Gregorius, M. J.	Appleton	Wisconsin
Gartman, Charles	Sheboygan	Wisconsin
Gartman, H. C.	Sheboygan	Wisconsin
Gartman, W. F.	Sheboygan	Wisconsin
Guelig, G. N.	Johnsburg	Wisconsin

Green, R. C. ..... Albion ..... Wisconsin
Grascamp, H. H. ..... Van Dyne ..... Wisconsin
Giffin, W. W. ..... Plymouth ..... Wisconsin

H.

Hiltman, R. S. ..... Mauston ..... Wisconsin
Helm, A. B. ..... Chippewa Falls ..... Wisconsin
Hank, Edwin ..... Sturgis ..... Wisconsin
Hoke, William J. ..... Ithaca ..... Wisconsin
Harwood, O. E. ..... Madison ..... Wisconsin
Hoeppner, John ..... Marion ..... Wisconsin
Harder, R. F. ..... Astoria ..... Oregon
Harren, E. E. ..... Liberty ..... Pennsylvania
Horton, R. A. ..... Fond du Lac ..... Wisconsin
Heckert, C. H. ..... Clinton ..... Wisconsin
Hahn, A. W. ..... Sheboygan Falls ..... Wisconsin
Howe, J. H. ..... Spring Green ..... Wisconsin
Held, Fred ..... Mt. Horeb ..... Wisconsin
Hatfield, P. H. ..... Wyoming ..... Wisconsin
Holzmiller, J. G. ..... Boscobel ..... Wisconsin
Helliker, C. E. ..... Milwaukee ..... Wisconsin
Hamm, W. P. ..... Kohlsville ..... Wisconsin
Haugartner, J. J. ..... Marion ..... Wisconsin
Howe, J. F. ..... Milwaukee ..... Wisconsin
Hosig, E. B. ..... Browerville ..... Minnesota
Huffman, Howard ..... Richland Center ..... Wisconsin

I.

Isexloth, A. A. ..... Theresa ..... Wisconsin
Indermuchle, C. H. ..... Glenbeulah ..... Wisconsin

J.

Joslin, Henry ..... Boaz ..... Wisconsin
Jordan, H. C. ..... Chilton ..... Wisconsin
Jorgenson, J. A. ..... Neenah ..... Wisconsin
Juade, Henry ..... Watertown ..... Wisconsin
Jonely, B. ..... Brownsville ..... Wisconsin
Jones. Frank L. ..... Utica ..... New York
Jung, Joe ..... Kohler ..... Wisconsin

K.

Knutson, K. O. ..... Elroy ..... Wisconsin
Kleiner, Frank ..... Welcome ..... Wisconsin
Kelty, John ..... Boscobel ..... Wisconsin
Koopman, Albert ..... Port Washington ..... Wisconsin
Kanera, John J. ..... Kewaunee ..... Wisconsin
Knickerbocker, S. E. ..... Wyoming ..... Wisconsin
Koehler, Albert ..... Black Creek ..... Wisconsin
Krueger, C. ..... Black Creek ..... Wisconsin
Kornely, C. C. ..... Kingsbridge ..... Wisconsin
Kerscher, F. J. ..... Manitowoc ..... Wisconsin
Koehler, A. C. ..... Plymouth ..... Wisconsin
Kreiser, Ben ..... Stark ..... Wisconsin
Kalk, Herbert ..... Sheboygan Falls ..... Wisconsin
Kiemme, William ..... Sheboygan Falls ..... Wisconsin
Kuska, George ..... Krok ..... Wisconsin
Koehler, Martin ..... West Bloomfield ..... Wisconsin
Klemam, Edward ..... Watertown ..... Wisconsin
Karlen, Jake ..... Monroe ..... Wisconsin
Karlen, F. J. ..... Monroe ..... Wisconsin
Kulhanek, Simon ..... Krok ..... Wisconsin
Kroysek, Charley ..... Kewaunee ..... Wisconsin
Kasper, P. H. ..... Lindonville ..... Wisconsin
Kalmerton, Edward ..... Sheboygan Falls ..... Wisconsin
Kurth, William ..... Neillsville ..... Wisconsin
Knickerbocker, Joseph ..... Wyoming ..... Wisconsin
Korkamp, Herman ..... Ostburg ..... Wisconsin
Keller, E. ..... Grafton ..... Wisconsin
Kachel, T. A. ..... Whitewater ..... Wisconsin
Knewzi, C. E. ..... Rubicon ..... Wisconsin
Kielsmeir, Otto ..... Hika ..... Wisconsin
Kachel, J. C. ..... Whitewater ..... Wisconsin

L.

Larsen, Osman ..... Mauston ..... Wisconsin
Lepley, Edgar ..... West Lima ..... Wisconsin
Lillibridge, C. M. ..... Chicago ..... Illinois
Levins, A. ..... Sheboygan Falls ..... Wisconsin
Loomis, H. J. ..... Sheboygan Falls ..... Wisconsin
Laabs, F. W. ..... Colby ..... Wisconsin
Laabs, A. G. ..... Dorchester ..... Wisconsin
Larson, H. C. ..... Dodgeville ..... Wisconsin
Loud, Edward P. ..... Sheboygan ..... Wisconsin

Luchsinger, John	Monroe	Wisconsin
Lagrandeur, H. A.	Somerset	Wisconsin
Lee, C. A.	Muscoda	Wisconsin

M.

Martinson, Jacob C.	Menominee City	Wisconsin
Martin, H. A.	Marshfield	Wisconsin
Marty, Gottlieb	Humbird	Wisconsin
Marty, Fred	Browntown	Wisconsin
McKinnon, M.	Sheboygan Falls	Wisconsin
McKinnon, E. L.	Sheboygan Falls	Wisconsin
Muelier, Henry	Sheboygan	Wisconsin
Mitzke, Fred	White Creek	Wisconsin
Moore, J. W.	Richland Center	Wisconsin
Mason, Peter	Manitowoc	Wisconsin
Michels, Matt.	Garnet	Wisconsin
McCaig, John	Hubbleton	Wisconsin
Muehlberg, Oscar	Random Lake	Wisconsin
Maechtle, Arthur	Port Washington	Wisconsin
Mayer, R. A.	Cascade	Wisconsin
McNicholas, F.	Plymouth	Wisconsin
Matti, Jake	Mt. Horeb	Wisconsin
Mechelke, Louis	Cascade	Wisconsin
Murphy, M. C.	Chicago	Illinois
Mashek Co., V. & C.	Sturgeon Bay	Wisconsin

N.

Newman, B. W.	Madison	Wisconsin
Noyes, H. J.	Muscoda	Wisconsin
Nafis, L. F.	Chicago	Illinois
Natzke, T. H.	Bonduel	Wisconsin
Noyes, H. L.	Muscoda	Wisconsin
Nemetz, Emil	Rosecrans	Wisconsin
Nelson, Birdell	Dale	Wisconsin

O.

Olson, G. E.	British Hollow	Wisconsin
Olson, A. J.	Spring Green	Wisconsin
Olin, C. F.	Valders	Wisconsin
Olin, O. H.	Hayton	Wisconsin

P.

Peck, Anson	Waverly	Iowa
Parkin, A. W.	Stanton	Wisconsin
Palmer, E. E.	Montfort	Wisconsin
Peacock, P. H.	Sneboygan	Wisconsin
Pheatt, H. D.	Milwaukee	Wisconsin
Pasch, A. F.	Green Bay	Wisconsin
Priebs, Henry	Loganville	Wisconsin
Proctor, George B.	Darlington	Wisconsin
Powers, Walter	Highland	Wisconsin
Pinzel, E. C.	Elkhart Lake	Wisconsin
Paper, C. H.	Cascade	Wisconsin
Peck, J. C.	Waldo	Wisconsin
Phillips, A. J.	West Salem	Wisconsin
Powell, J. K.	Stevens Point	Wisconsin

R.

Robinson, E. H.	Elroy	Wisconsin
Reed, H. P.	Quincy	Wisconsin
Roeder, M. E., Miss	Milladore	Wisconsin
Radloff, M. P. E.	Hustisford	Wisconsin
Rickert, G. W.	Clintonville	Wisconsin
Rew, E. A.	Seymour	Wisconsin
Ruetter, Peter	Twin Bluffs	Wisconsin
Regen, Jacob	Monroe	Wisconsin
Rohde, Otto	Symco	Wisconsin
Reineking, F. C.	Plymouth	Wisconsin
Rothenbach, J.	Ackerville	Wisconsin
Roth, C.	Monroe	Wisconsin
Reid, J. J.	Oconomowoc	Wisconsin
Roloff, E. F.	Welcome	Wisconsin
Roemer, Joseph A.	Fond du Lac	Wisconsin

S.

Stetler, J. A.	Granton	Wisconsin
Steiner, August	Mauston	Wisconsin
Schafer, J. A.	Prairie Farm	Wisconsin
Stanz, H. B.	Milwaukee	Wisconsin
Schroeder, H.	Morrison	Wisconsin
Schafer, George H.	Marshfield	Wisconsin
Schafer, Phillip	Kewaunee	Wisconsin

Skinner, D. P.	Milwaukee	Wisconsin
Schanen, N. J.	Lake Church	Wisconsin
Schwichtenberg, William	Sawyer	Wisconsin
Spies, N. E.	Fredonia	Wisconsin
Slyfield, E. L.	Sheboygan	Wisconsin
Steines, T. L.	Tennison	Wisconsin
Sterns, W. P.	Kasson	Wisconsin
Sneberk, Albert	Algona	Wisconsin
Splittgerber, Fred	Clintonville	Wisconsin
Swenson, S.	Boscobel	Wisconsin
Siggleko, O. E.	Hika	Wisconsin
Sieger, F. J.	Kellnersville	Wisconsin
Singleton, F. J.	Newboro	Ontario
Shimek, Emil	Branch	Wisconsin
Schlosser, Jake	Spring Green	Wisconsin
Scott, H. M.	Sheboygan	Wisconsin
Schley, Henry	Forest Junction	Wisconsin
Schultz, H. S.	Cato	Wisconsin
Steiner, J. & M.	Milwaukee	Wisconsin
Sohrweide, William	Reedsville	Wisconsin
Schaller, Alexander	Mt. Horeb	Wisconsin
Sawyer, L. H.	Neptune	Wisconsin
Southard, R. B.	Lookout	Wisconsin
Stocker, Jacob	Sheboygan Falls	Wisconsin
Straubel, C. A.	Green Bay	Wisconsin
Steinwand, J. F.	Colby	Wisconsin
Steinwand, A. M.	Colby	Wisconsin
Sixel, H. G.	Sheboygan	Wisconsin
Smethurst, J. M.	Chicago	Illinois
Smalley, A. K.	Milwaukee	Wisconsin

T.

Thym, Ottomar	Markeson	Wisconsin
Thomson, F. M.	Boscobel	Wisconsin
Thomson, Mike	Hollandale	Wisconsin
Tanberg, H. P.	Spring Valley	Wisconsin
Te Hennepe, B.	Sheboygan Falls	Wisconsin
Taylor, Ernest	Terrill	Wisconsin
Thiel, John H.	Potter	Wisconsin
Thomas, W. C.	Sheboygan Falls	Wisconsin

U.

Ullmar, J. S. ..... Green Bay ..... Wisconsin
Ulbhelohde, T. A. ..... Glenbeulah ..... Wisconsin
Urben, Alfred ..... Blue Mounds ..... Wisconsin

V.

Vandusen, E. P. ..... Mauston ..... Wisconsin
Voigt, Joseph ..... Orihula ..... Wisconsin
Voigt, John ..... Orihula ..... Wisconsin
Voight, William ..... Louis Corners ..... Wisconsin

W.

Wittwer Bros. ..... Monticello ..... Wisconsin
Watson, Frank ..... Honey Creek ..... Wisconsin
Warner, J. A. ..... Viola ..... Wisconsin
Wuerger, W. ..... Greenleaf ..... Wisconsin
Wallace, Patrick ..... Hortonville ..... Wisconsin
Wolfinger, Joseph ..... Dundas ..... Wisconsin
Wolter, F. L. ..... Seymour ..... Wisconsin
Waterstreet, F. J. ..... Kewaunee ..... Wisconsin
Whitney, Ira P. ..... Cornwallis ..... Wisconsin
Wunsch, Edward ..... Haven ..... Wisconsin
Waterstreet, William ..... Marshfield ..... Wisconsin
Ward, J. E. ..... Sandusky ..... Wisconsin
Williams, C. H. ..... Chicago ..... Illinois
Weiner, Peter ..... Jounseurt ..... Wisconsin
Watson, D. G. ..... Fond du Lac ..... Wisconsin
Wetor, John ..... Random Lake ..... Wisconsin

Z.

Zwizky, John J. ..... Point Bluff ..... Wisconsin
Zang, Fred ..... Marion ..... Wisconsin
Zimmerman, W. ..... Elkhart Lake ..... Wisconsin
Zeab, W. ..... Nero ..... Wisconsin
Zickert, Edward ..... Watertown ..... Wisconsin

TWELFTH ANNUAL CONVENTION

OF THE

WISCONSIN CHEESE MAKERS' ASSOCIATION,

HELD IN THE

CONVENTION ROOMS, REPUBLICAN HOUSE,

MILWAUKEE, WISCONSIN,

Wednesday, Thursday and Friday, January 6, 7 and 8, 1904.

PROGRAM.

INTRODUCTORY SESSION.

Wednesday, 10 A. M.

Address of Welcome.....

....Wilmer Sieg, Milwaukee, Wis., Pres. Milwaukee Athletic Club

Response .....R. R. Bates, Madison, Wis.

General Greetings.

President's Annual Address .....J. K. Powell, Stevens Point, Wis.

Appointment of Committees.

Inspection of Cheese Exhibit.

SECOND SESSION.

Wednesday, 2 P. M.

"Benefits Derived From Using the Automatic Curd Agitators"....

.....H. M. Scott, Sheboygan Falls, Wis.

"Septic Tanks, or Sub-Earth Sewage Disposal".....

.....Matthew Michels, Garnet, Wis.

"Preparation and Propagation of the Pure Commercial Culture"..

.....W. A. Austin, Spring Green, Wis.

"Economy in Marketing Cheese".....H. J. Bamford, Plymouth, Wis.

"Cheese Factory Accounting".....Frank Dewhirst

Discussion—"What is a Fair Compensation for Making Cheese."

THIRD SESSION.

Thursday, 9 A. M.

"The Cheese Maker and the Patron" .....
.....C. H. Everett, Racine, Wis., Editor Wisconsin Agriculturist
"Some Things Outside the Cheese Factory".....
.....Prof. F. G. Short, Ft. Atkinson, Wis.
Address .....E. J. Piggott, Chicago, Ill.
"The Paraffining of Cheese" .....Prof. H. J. Noyes, Muscoda, Wis.

FOURTH SESSION.

Thursday, 2 P. M.

"The Factory Operator—An Organizer for the Betterment of Rural Communities" .....
.Prof. R. A. Moore, Madison, Wis., Agronomist, Wis. Exp. Station
Address—"Laws Relating to Clean and Sanitary Condition in Cheese Factories" .....
Prof. J. Q. Emery, Madison, Wis., Wis. State Dairy and Food Com.
"Cheese Making in Ontario".....
Prof. G. H. Barr, Strathroy, Ont., Can. Chief Inst. West'n Ontario Educational Cheese Contest.
Reading of the Cheese Scores by Chairmans of the Committees on Cheese Judging.
Awarding of Medals and Diplomas.
All Medals and Diplomas will positively be properly engraved, signed and awarded at this session.
"Short Statement 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."

FIFTH SESSION.

Thursday, 7:30 P. M.

Report of Secretary .....U. S. Baer, Madison, Wis.
Report of Board of Directors .....F. J. Karlen, Monroe, Wis.
Report of Treasurer .....John B. McCready, Menomonie, Wis.
Report of Committees.
Report of Officers and Business Meeting of the Association.

SIXTH SESSION.

Friday, 9 A. M.

"Wisconsin Cheese at the World's Fair".....
.....H. K. Loomis, Sheboygan Falls, Wis.
Address .....Sidney C. Thompson, Winterport, Me.
Main State Dairy and Food Commissioner.
"Instruction in Cheese Factories in Western Ontario".....
.....Prof. G. H. Barr, Strathroy. Ont., Canada

SEVENTH SESSION.

Friday, 2 P. M.

"A Few Stray Thoughts".....W. C. Thomas, Sheboygan Falls, Wis.
Publisher Sheboygan Co. News and Dairy Mkt. Reporter.
Address .....W. D. Collyer, Chicago, Ill.
Representing U. S. Dept. of Ag., Washington, D. C.
"Hints Upon the Construction of Cheese Factory Buildings".....
.... U. S. Baer, Madison, Wis., Asst. State Dairy and Food Com'r.
"The Wisconsin Cheese Makers' Association as an Educator"....
.....R. A. Murray, Yuba, Wis.

PREMIUMS.

CHEESE EXHIBIT.

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 de-

sign. 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, Longhorns, 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 entry 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:

R. A. Horton, Fond du Lac, Wis.
S. E. Knickerbocker, Wyoming, Wis.
John Luchsinger, Monroe, Wis.
J. T. Steiner, Milwaukee, Wis.

Superintendent:

J. W. Cross, Mauston, Wis.

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 blanks 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 should be shipped by express (*charges prepaid*) to the Secretary, at Republican Hotel, Milwaukee, Wis.

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

Exhibitors will be limited to one entry 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 destroyed in transit.

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

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 tryer 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, except in those instances where the premium cheese is of the large Swiss Drum type, in which case the Association will not retain more than one-fourth of the cheese. 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

LIST OF CONTRIBUTORS.

Colonial Salt Co., Akron, Ohio	$25 00
David Muir and White, Fond du Lac, Wis.	25 00
Creamery Package Mfg. Co., Chicago, Ill.	25 00
Wisconsin Dairy Supply Co., Whitewater, Wis.	15 00
Louis F. Nafis and Co., Chicago, Ill.	10 00
Chr. Hansen's Laboratory, Little Falls, N. Y.	10 00
Monarch Refrigerating Company, Chicago, Ill.	10 00
The Preservaline Mfg. Co., Chicago, Ill.	10 00
J. and M. Steiner, Milwaukee, Wis.	10 00

Worcester Salt Co., New York, N. Y.	10 00
Sturges and Burn Mfg. Co., Chicago, Ill.	10 00
Francis D. Moulton and Co., Chicago, Ill.	10 00
Republican Hotel, Milwaukee, Wis.	10 00
Sharples Separator Co., Chicago, Ill.	10 00
Wells-Richardson Butter Color Co., Burlington, Vt.	10 00
Diamond Crystal Salt Co., St. Clair, Mich.	10 00
E. A. Roser and Co., Chicago, Ill.	10 00
A. H. Barber and Co., Chicago, Ill.	10 00
J. B. Ford Co., Wyandotte, Mich.	10 00
The De Laval Separator Co., Chicago, Ill.	10 00
A. H. Barber Mfg. Co., Chicago, Ill.	10 00
Dundas Woodenware Co., Dundas, Wis.	10 00
John Muir, Chicago, Ill.	5 00
A. J. Decker, Fond du Lac, Wis.	5 00
M. H. Fairchild and Bro., Chicago, Ill.	5 00
Total	$285 00

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS

OF THE

Wisconsin Cheese Makers' Association

TWELFTH ANNUAL MEETING, 1904.

The meeting was called to order at 10 o'clock A. M., January 6th, by Acting President J. K. Powell.

After announcing that the twelfth annual convention of the Wisconsin Cheese Makers' Association was in session, the President introduced Mr. Louis G. Bohmrich, who gave the following

ADDRESS OF WELCOME.

HON. LOUIS G. BOHMRICH, MILWAUKEE, WIS.

Mr. Chairman and Gentlemen of the Convention: I am grateful to the committee whereby I have the honor to greet you gentlemen of the Wisconsin Cheese Makers' Association on behalf of our Citizens' Business League in a hearty welcome to the city of Milwaukee. That you have again returned to

our beautiful city for the purpose of holding your annual conventions is not only a source of satisfaction to our people who, I assure you, are participating heartily with me in this welcome, but it is proof positive that all that which we have said to you heretofore in favor of Milwaukee as a proper convention place, and as a proper distributing center of your product, has been found verified by your experience.

Milwaukee's business sagacity, coupled in a notable manner with a conservatism that assures safety, her broad tolerance and hospitality, her energy in developing her vast industries, commerce and trade; the character of her people so typical of the push of American cities, all these are the pride of her citizens and the foundation of the invitation which brings gatherings like this within her borders. Within the past year Milwaukee has shown a large increase in her commerce, even beyond that of the giant city of Chicago to the south to the extent of over three per cent. We state these facts to you not with a desire to boast, but simply to show you, gentlemen of Wisconsin, that Milwaukee is abreast of the times.

It is but natural that the metropolis of Wisconsin watches with interest the industry which you represent, and we are specially gratified to note the rapid development and progress of this our cheese industry, and we are pleased when the little round dots upon the map of the Official Dairy Commission of the state increase in number so rapidly as they have done in the year past. They indicate that cheese factories are born almost every day and this is a gratifying fact to us who naturally love to see the state prosper. We note with pleasure that your product, since 1902, when seventy million pounds were manufactured, has reached the enormous amount of ninety millions; that in 1902, with 1,600 cheese factories in the state, the increase has reached the number of almost 2,000. To those of you who can figure, it will be interesting to note that in 1903, there was sufficient cheese manufactured to fill 3,500 cars, or almost 125 trains. The milk of almost 1,000,000 milch cows was required.

Now, who is the man that, in face of these facts, and taking into consideration that millions of acres of our state are still undeveloped, taking into consideration the fact that large tracts of land which ten years ago were considered worthless are now

the best grazing places in the world and are spotted with farms in a succession undreamed of but five years ago; who is the man who in view of these facts will deny that this great industry of Wisconsin, the manufacture of cheese, is as yet in its infancy, a mere baby in the cradle of the commercial future?

Therefore, gentlemen, gatherings like this are a benefit. They give an opportunity for an interchange of thought upon the subject that is fast beginning to play a part, although an enormous one, in the commercial activity of our state. Let me call your attention to the fact that the opportunities which you have are much more ample, in which to develop the industries you are interested in, than your fathers had. The mysteries that formerly surrounded the manufacture of cheese are gone. It is not now simply dependent upon the soil, upon the cattle, upon the food, upon the climate. It is dependent now upon science in the recognition of the fact that in the manufacture of cheese there goes on a natural chemical revolution of which the parties were ignorant, and in the manufacture of which they simply acted by experience and somewhat in the dark. The thermometer, the acidimeter and the lactometer, all these instruments of science that are now in the hands of every factoryman or farmer, if he wants them, are the lights that guide you in the perfection of your trade.

I have been informed, and know it to be a fact, that some of the larger cities of America have recently adopted the methods of our older countries in establishing trade schools where we find men grown old in the practice of their trade studying the technical parts thereof; pushing onward by the necessities of competition, and by the fact that science has opened the field and light can be thrown upon all that which formerly was but a mystery. Milwaukee has such a school. It is still in its infancy, although some eight or nine years old, and the number of trades taught is limited; we find brewers and tanners and other trades represented, but in your trade, as well as all others, these things are coming to be simply scientific and commercial questions. It is sometimes a hardship for a young man to leave his farm and come to the city and there be instructed upon the technical necessities of his business, but it will soon come to be recognized as a commercial necessity which no young man can afford to overlook.

With these few remarks, Mr. President and Gentlemen, I give you welcome to Milwaukee. The city is yours. I know that the administration has buried the keys, and as far as the cheesemakers are concerned, all the policemen are discharged, and I hope that while you are here, after attending to your necessary business and duties, you will enjoy the great tolerance and loyalty of the people of Milwaukee. I thank you.

RESPONSE.

R. R. BATES, MADISON, WIS.

Mr. President, Representative of The Citizens' Business League, and Citizens of Milwaukee: It is with a degree of pleasure and cheer that I attempt to reply to your eloquent address, to the warm welcome that we have had this morning. It is with a great deal of anticipation, in view of the fact that we have met with you before, and have enjoyed being with you, that we meet here this morning for our annual convention of this organization. When we get such a warm, cordial welcome from a body of men like the Business Men's League, in this our greatest business city in the state, it is an encouragement to us in our business. We have learned, thick-skinned farmers as we are, that in order to win in this world, we must be specialists. I want to say to the Business Men's League of Milwaukee, that these men are almost every one of them experts in their line. Our forefathers built up a reputation for cheese making that they were proud of. Then unscrupulous men came along, working in their own interests and sacrificed the business that had been built up years before; they made Wisconsin cheese a disgrace in the foreign market. A good many years ago this organization in its infancy undertook a problem that at that time seemed impossible of solution and for many years we struggled without very much result, but I am glad to say that we are again bringing before the people of the state of Wisconsin and of the United States a reputation for one of the finest products

of the state of Wisconsin, that we feel proud of. There is not sufficient recompense in the business that we are interested in to pay for the effort that it has cost. We work more cheaply than some men, but we are working in view of the fact that we are trying to bring the greatest good to the greatest number of our citizens, and of the people that eat the product that we call cheese, and which is shipped abroad out of our borders. We certainly feel grateful to the Business Men's League of this city for offering us this cordial welcome. It is an encouragement to us in our work to meet here once a year for a few days and receive such a welcome, and to know that we are surrounded by such broad business men. We feel encouraged to go on in our efforts.

We thank you again for the cordial welcome you have extended to us this morning, and we hope to conduct ourselves in such a way that you feel that we are worthy of the welcome you have offered us. Again, I thank you.

Under the head of General Greetings, several gentlemen present were called upon to briefly address the convention, and the following were thus heard from with words of encouragement and inspiration:

Prof. H. J. Noyes, of Muscoda, Wis., S. E. Knickerbocker, of Wyoming, Wis., and Mr. F. Rankin, of the Cheese and Dairy Publishing Co., Whitewater, Wis.

The Chairman: The next on the program is the President's annual address.

ANNUAL ADDRESS.

ACTING-PRESIDENT J. K. POWELL, MILWAUKEE, WIS.

After the reports of the various officers and the preparation of this fine program by the Secretary, there is but little left for the President to say, but I have just a few words to offer. It has fallen to me to act as President on account of the death of Mr. Thomas Johnston and the absence of our Vice-President, I being the senior director. Mr. Johnston came from Canada

and staid with me when he first came here before he went into the employment for which he came, and I can assure you it pains me very much, even to refer to the circumstances which make it necessary for me to stand in his place today. We all wish he were here. In the loss of Mr. Thomas Johnston and of Mr. William Dickson we mourn the loss of two of our best men; men who have been with us from start to finish, who have given their very best efforts to this association, and to whose efforts the success of the association is largely to be attributed.

As you can see, our Secretary has gotten up the best program we have ever had. We are to have addresses here from men from Canada, Maine, Illinois and other states, besides the many talented men who appear on the program from our own state, and every man is familiar with his subject, which assures us of one of the best conventions, the most interesting we have ever had. Now, I want to brag a little bit. I do not think there is any other association in the world that has accomplished as much as we have in the short time since we started out and with the same chance that we have had. It has all been a work of love, as you might say, but our growth in membership has been steady since the first year or two, and our growth in membership has not been so important a factor as the growth in the influence that we have had on the cheese industry. The subject of marketing cheese is a very important one, offering a great field for discussion. I have been saying for many years that I did not think we would ever get this cheese business down to anywhere near perfection until the cheese are sold for what they are actually worth, and in order to sell cheese satisfactorily, I believe that the buyer, the seller and the cheese should be present when we make the sale. Another thing, when the cheese begins to sell for what they are worth, we will see an effect upon the farmer; he will begin to try to produce the best article he can, and until that time there is not sufficient reward to pay a man for taking extra pains in making fine cheese. We all want the cheese maker to feel that he is part of this association, and that the good that he may gather from this association depends on the interest that he takes in it. Now, we have a good program for this convention; it will be interesting from start to finish, and I hope you will all be here promptly at every session.

Convention took recess until 2 o'clock P. M.

AFTERNOON SESSION.

The convention met at 2 o'clock, Wednesday, January 6th, 1904.

Acting President Powell in the chair.

BENEFITS DERIVED FROM USING THE AUTOMATIC CURD AGITATORS.

H. M. SCOTT, SHEBOYGAN FALLS, WIS.

I must first tell you I have prepared no paper of facts and figures, but am just giving you a few of my observations and convictions from about three months' use of the curd agitators in my factory, and you must not be surprised if I am somewhat hazy in some of my points.

About two year ago, Instructor Aderhold paid our Board of Trade a visit and told us of the Canadian Agitator, strongly advocating the use of them. It was evident to me, as it must have been to others, that a successful machine would be just the thing, and in the Canadian machine, as improved by Mr. McKinnon, of Sheboygan Falls, I think we have it. Manufacturers claim it a saving of labor, the making of more and better cheese. It not only saves the forty to fifty minutes of stirring curd, but it takes power to operate it, and the same power will mill curd and pump water.

The greatest gain is in the saving of fat; the curd is never broken or jammed, but remains just as you cut it. As I understand the matter, the greatest loss of fat occurs from the fat globule being exposed and floating off in the warm whey. With the agitator you will not see the small particles of fat in the whey as when stirred by hand. But you "must watch out," or you will get more cheese than you want by retaining excess moisture.

In stirring curd by hand it settles down while going from one end of the vat to the other. In settling down this way I believe the weight of the curd has a tendency to press out moisture. With the agitator, curd never settles, but is always floating, so you must depend on heat more or less, to expel the excess moisture.

I heat about four degrees higher, cut curd finer and stop agitator at least twenty minutes before whey is ready to draw, then stir with a rake.

MAKING A BETTER CHEESE.

I don't believe we can make better cheese than some of the old-timers have before us; perhaps a more uniform grade.

The stirring of the curd with the agitator will make no better cheese, further than it lets up on the cheese maker's body and lets his head work; a weary body makes a weary brain.

On a fast working curd it is an advantage, because you can raise your temperature in one-half the time it would take in stirring by hand. I believe the saving of fuel in heating up a vat will nearly pay the cost for operating the agitator. The curd and whey constantly circulating seem to take up all the heat expended under the vat.

In conclusion I must say it is a pleasure and relief that no cheese maker can fail to appreciate, after hustling all of the morning to get curd cut to then have a chance, as the Instructor told me, "to sit down with a smile of content and listen to what he had to say."

DISCUSSION.

Mr. Clark: What is the cost of putting the agitator in?

Mr. Scott: The agitator itself is about $30, complete to the shafting.

Mr. Clark: Does the size of the vat make any difference?

Mr. Scott: No, I don't think it does. The agitator must be made to fit the vat, that is all. Mr. McKinnon is here, I don't know whether he makes any difference in cost or not. On

an 18-foot vat, we have to have six paddles; on a 15-foot vat but five would be needed.

A Member: What amount of power is used to run the agitator?

Mr. Scott: But very little. A man could turn it by hand and do it easily.

The Member: Is it a fact that an improved cheese can be made by the use of one of these agitators?

Mr. Scott: As I said, I do not believe the use of an agitator will actually make any better cheese, only in this way: the curd is constantly in motion and you get a more even cook. When any one gets used to it, I think he can make a closer cheese. It appeared to me in boring the cheese that the plugs came out more smooth and close.

Mr. Van Leeuwen: What agitator was it that you used?

Mr. Scott: It is the Canadian style, improved by Mr. McKinnon. The agitating part is the same as used in Canada.

Mr. McKinnon: Gentlemen, the model of the agitator, such as Mr. Scott has been using, can be seen out in the hall. In regard to the price of the agitator, the price varies somewhat. As a matter of fact, you have to have more machinery and more gearing all around on an 18-foot vat than upon a shorter vat, and there is a variation in price, but not very great. I think Mr. Scott would want to emphasize very clearly and distinctly the fact that it requires a little better cooking and a little higher cooking than if you stir with a rake.

Mr. Scott: Yes, but there are always conditions connected with that. In my ordinary work, I work what we call a fast-working curd. After an hour and a half setting, I draw the whey, and under those conditions you have to cook higher, but in letting it set two or two hours and a half, I don't think it will be necessary to cook it any more. In ordinary handling any cheese maker knows that in the first fifteen minutes the curd will pack down so hard it will press out the moisture, and if you use the agitator from the time you start, it never settles down, the particles are always floating and you depend entirely on the heat to expel this excess moisture.

Mr. Clark: What power do you use?

Mr. Scott: I use steam power and I think it is preferable to any other power, because then you have the steam for your

heating and other purposes. I have found in the fall of the year that this agitator had to be run faster as the curd increased in the milk so that there was a heavier curd to handle. In the summer time we run the agitator about ten revolutions a minute; in the fall we have to run it from twelve to fifteen in order to keep this curd floating. With a steam engine you can regulate the speed easily.

A Member: How many of the cheese factories are equipped with the steam engine? I guess we have only one or two engines in our neighborhood.

Mr. Scott: There are but very few that are equipped that way, but in equipping that way you can do much more work and do it so much easier.

A Member: Will your agitator keep the curd from settling in the corners?

Mr. Scott: Yes, after it is once started we never have any trouble.

A Member: How close to the end of your vat do you run the paddles?

Mr. Scott: It should run just as close to the end of the vat as it will clear. It can run six inches from the side and be all right.

A Member: You can put but one paddle in for every three feet of vat space. Wouldn't there be difficulty in fitting all vats?

Mr. Scott: No, they can take the length of the vat and fit it all right. In my factory we have two vats, the first one is 18½ feet, and we have in that six paddles. In the other one we only put in four paddles and in this last one we put in the two end paddles just clear, just so they won't strike. If they get fastened together, and your engine keeps on going, there will be trouble. The closer you can get them together and not have them catch, the better it is. They are narrowed or widened to suit the size of the vat. When you order your agitator, you send the dimensions of your vat to the manufacturer and he will make the agitator to fit your vat. You can start the thermometer in one corner and that goes clear around, that shows the current. One can put those paddles on in a minute and a half to two minutes. A man can take them off, wash and hang them up in five

minutes. They are very easy to keep clean, they are made of galvanized iron.

Mr. Van Leeuwen: Has any one determined the exact amount of power that is required to run one of these agitators, say, on a vat containing 4,000 pounds of milk?

Mr. McKinnon: I can't make a direct answer to that, but I can ask the audience to take into consideration my physical ability, and estimate how strong I am, about, from general appearance, and I will say that I have a vat of 6,000 pounds of milk. We will put the agitator in to try it, and turn the agitator by hand and that will show how much power you would need from an engine for that amount of milk.

Mr. Scott: It doesn't take as much power to run the agitator as it does to mill the curd. The curd mill requires more power than the agitator. Of course, after your curd is settled down once, it is pretty hard starting then.

Mr. Clark: It is more than a one man power then?

Mr. Scott: Yes. The trouble is that the curd in the bottom is so heavy and the power is so far away that these arms will spring and get all tangled up. If you can once get them started, then it will go all right. Every cheese maker knows that with fifteen minutes start, the curd will settle fast and become quite well matted. We start the agitator as soon as we get the curd cut.

A Member: Do you start at the same speed at which you finish?

Mr. Scott: Yes. The curd won't be broken a particle. You will find pieces of curd sometimes two or three inches long if you are not pretty particular in cutting, as the agitator does not break up the curd, and your cook will be just as you cut the vat. This really should not be called an agitator, it is really a circulator. It carries the curd round and round and the breaking of the current is done so easily and gently that there is no bruising of the curd. An agitator will work 7,000 pounds of milk and curd better than three men can.

Mr. McKinnon: It will also keep the temperature more uniform and even throughout the contents of the vat.

Mr. Scott: Yes, because the contents of the vat is in constant motion from start to finish.

The Chairman announced the following committees:

On Resolutions:—R. C. Green of Albion, Wis.; John Luchsinger, Monroe, Wis.; Fred Bender, Boaz, Wis.

On Legislation:—A. D. DeLand, Sheboygan, Wis.; M. McKinnon, Sheboygan Falls, Wis.; E. L. Aderhold, Neenah, Wis.

PREPARATION AND PROPAGATION OF THE PURE COMMERCIAL CULTURE.

W. A. AUSTIN, SPRING GREEN, WIS.

Upon the successful preparation, propagation and practical application of the Pure Commercial Culture, depends in a large measure the flavor and general character of the cheese. The greatest success will be obtained by a very close observance of minute details all through the life of the starter. Care, caution, and cleanliness should be the watchword in all work applied to the starter. Every pail, can, dipper or agitator, in fact all utensils used should be thoroughly washed and sterilized each time before using, to prevent any outside contamination, and used only in connection with a starter.

The "startoline" can be prepared in the following way: In the morning select two quarts of the best milk you can obtain, fresh morning's milk is preferable. A tin pail containing the two quarts of selected milk is placed in boiling water and stirred frequently for at least one hour. At the end of the time remove the pail and place it in a tub or tank of cold water and cool rapidly with frequent stirring until the temperature is reduced to 80 degrees, F. When cooled, keep the pail well covered. The contents of a small package of "Lactic Ferment" is then added and thoroughly stirred into the pasteurized milk, as soon as the temperature is below 100 degrees F.

The pail is kept in the water at 80 degrees F., and at that temperature it remains until the next morning, when the milk should be moderately thickened.

If it is desirable to have forty pounds of starter, take that

quantity of clean, fresh morning's milk and heat it to 180 or 190 degrees F. by setting the starter in boiling water. It should be kept at this temperature for at least forty minutes. It is then cooled as rapidly as possible to about 65 degrees F. The milk should be stirred very frequently during the heating and cooling process—stirring in heating, to prevent as much as possible the scorching of the milk on the inside walls of the can, and in cooling, to aid in a more rapid and even decrease of temperature.

When the time for cooling the heated milk has arrived, the "startoline" should be inspected, and if it is still in a liquid form, set it in warm water at about 90 degrees. This will cause it to thicken in a short time.

When the forty pounds of pasteurized milk is cooled to the desired temperature, which is approximately 65 degrees F., the "startoline" is stirred until liquified and of a nice, smooth, creamy appearance, and the proper amount or percentage, which should be about 3 or 4 per cent. in the first propagation, is then added and thoroughly stirred in. This preparation is kept at this temperature (which is approximately 65 degrees F.) until the next morning when it should be just thickened and ready for use.

Each evening a small quantity of this preparation should be reserved in a suitable sterilized vessel and tightly covered. This reserved portion should be cooled and held at about 60 degrees F. until the next day, when it should be properly thickened, when ready for use. This in its turn, constitutes startoline.

It is desirable to have both the "startoline" and starter moderately thickened or lobbered, because it is then supposed to be of an approximately known acidity; this is not, however, an infallible rule, as the coagulating point of the starter may vary considerably, due largely to peculiar local conditions. If an acid test is made, the starter should not exceed .6 per cent. acidity. It is absolutely essential that the acidity should not go beyond this stage, as the starter will be apt to get sharp or slightly rancid, which will not only injure it individually, but will impair its vitality for propagation purposes, as it is a well known fact, a high per cent. of lactic acid will act as an antiseptic, and thus injure the acid producing bacteria.

The exact percentage of "startoline" to be used in the pas-

teurized milk cannot in all cases be given. The same amount does not always appear to serve the desired purpose with all milks, but evidence has shown that the proper amount of startoline will vary from 1 to 4 per cent. of quantity of starter used.

It is well to note that for the first week the lactic acid producing bacteria grow more vigorously with each succeeding generation, and that *less* startoline will be needed with each propagation, and it may be desirable to lower the ripening temperature of the pasteurized milk.

It is better to remove an inch or two from the top portion of the starter before breaking it up, as there is apt to be some undesirable germs on the top portion, which have gained access to the starter can.

The starter, when stirred, should break up quite readily and appear like smooth, ripe, rich cream when ready for the churn, with a clean, mild, sour or tart flavor that will be pleasing to the taste and sense of smell.

After the starter has acquired its full vigor, it can usually be set at the same temperature and hour each day, and by using the same per cent. of startoline, can be relied upon to be in proper condition at the time of using.

At the first signs of its failing vitality, or as soon as the starter does not ripen to the desired point in the usual time, providing the temperature and other conditions are normal, a new culture should be secured and be built up, as experience has taught, that, when it becomes necessary to raise the temperature four or five degrees in order to have a starter ripen in a given time, that in a few days at most, the starter will be off in flavor and unfit for use.

Should your starter show signs of being slightly coagulated or thickened several hours before wanted for use, its temperature should be lowered to 40 or 45 degrees, as quickly as possible, by placing the starter can in ice-water. Care should be taken not to disturb or break up before using.

The proper percentage of starter to use in cheese making, is that which will give the best results in the quality of the cheese, and usually will not vary far from 1 per cent.

DISCUSSION.

Mr. Dewhurst: How long can you keep your starter without deterioration?

Mr. Austin: That varies somewhat upon what care is exercised in cleanliness and perfect pasteurization and so on. We have been able to carry them several months, while other makers have lost them in a very short time.

Mr. Dewhurst: Would you put .6 per cent. as the highest possible limit? Don't you think you could run it to .7 without danger?

Mr. Austin: It is barely possible, but whenever you reach that acidity, you are approaching the danger line. I am not a bacteriologist, but I presume that acid producing bacteria are about as strong and active at the coagulating point as anywhere.

Mr. McKinnon: What do you mean by the danger line?

Mr. Austin: The lactic acid producing bacteria have developed a certain amount of lactic acid; at that point this production of acid seems to cease and putrefactive bacteria then begin to get in their work. If you run your starter too far, it is apt to develop a sharp flavor.

Mr. Van Leeuwen: Do you use that starter every day in the summer time?

Mr. Austin: Well, yes, we aim to use a small amount at least every day. We aim to reject any milk that comes in too ripe for use, and to use a small amount of starter.

Mr. Van Leeuwen: What is the condition of your milk provided you would set it when it arrives at the factory, how long would it be before you would be able to draw off the whey with one-quarter of an inch of acid on the curd, if you did not use any starter?

Mr. Austin: I couldn't answer that, because we have always used a starter, a small amount of it. We always add our starter to the vat so that the starter is already in before we receive the milk.

Mr. Clark: If your milk has reached a certain ripeness, and your starter contains .6 of one per cent. of acid, won't you get uniform results each day?

Mr. Austin: Why, it should be nearly so.

Mr. Noyes: Can't you manipulate your curds so that you can bring them uniformly every day?

Mr. Austin: I think so.

Mr. Van Leeuwen: I believe you can do that just as well if your starter contains .5 of acidity one day and .7 another day, if you govern the amount of starter that you add accordingly. For instance, you have a vat of milk that shows you a Marshall Rennet test of 4 spaces. It is too sweet for setting. We have tested our starter and we find that it contains only .4 of one per cent. of acidity. So we use more of that starter than if it contained .6, and we will get uniformity just the same.

Mr. Austin: We must have some general rules or principles to go by, and we use .6 per cent., terming it the danger line, so as not to run our starter beyond that point, because there is danger that our starter will become too sharp.

Mr. Wallace: Don't you see what your starter is before making your rennet test?

Mr. Austin: Yes.

Mr. Wallace: Then you would know the exact percentage of starter to use.

Mr. Austin: No, I don't know as we would. We would be governed by the way our curd has been working. We have to govern that the same as you would ripen your vat, and with your rennet test you don't know when you start out the first day in a strange factory how you want to ripen that milk in order to have the required amount of acidity at a given time. Of course, the starter is not a cure for everything in cheese making.

Mr. Van Leeuwen: How long do you aim to have your milk set before the whey is ready to draw, and with what acidity do you draw?

Mr. Austin: That depends somewhat on conditions, too. In most of the vats in the factories where I have been in the last two years, we have self-heater vats and we run about two and a quarter or two and a half hours, but where we have steam, we run them to two hours and reach about the same results. Most of the self-heater vats, I find, we are not able to fire up fast enough.

A Member: Is it not a common practice where they use commercial starters to use 5 per cent.?

Mr. Austin: I think not. Where I was this summer, we used from a half to one per cent., and we found it sufficient. We had enough starter so that half an hour or twenty minutes after our milk was in the vat, it was sufficiently ripened and ready to set. We do not use the starter to hurry the process in order to get done early in the day. We just want to use enough starter to bring it to a desired point at the desired time, we don't hurry to get through so that we may go to the baseball game, we want our cheese made first, and we don't propose to allow our cheese makers to use an unsafe amount of starter in order to hasten the manufacture.

Mr. McKinnon: This question grows more important year by year. The gentleman we had from Canada last year was in favor of using a very little starter. The speaker today is in favor of using considerable, and using it all the time. These gentlemen from Canada use just what they believe is absolutely necessary, and they have made a good deal of a study of it, too.

Mr. Austin: I don't know where Mr. McKinnon got the idea that we use an excessive amount. I said one per cent., and under all conditions we should use just the right amount.

Mr. Wallace: Did those Canadian speakers say that the Canadians brought milk already started?

Mr. Austin: I think not.

Mr. Wallace: I think they did claim that they hauled their milk from great distances, and it came in partly ripe.

Mr. Austin: The point we wish to make is, that we think we can do better than with the average starter that the farmer brings to us.

The Chairman: It amounts to this, that the starter places the milk under your control, and it is your judgment that makes the cheese, and I guess they do that in Canada, too.

Mr. Armitage: It is evident that this starter does not have the same effect with all kinds of milk. I have been using it three years and a half and I have a neighbor close to me who uses it, and he can set his milk at 6 spaces on the Marshall Rennet Test and I can set mine at 4 spaces, and his whey is ready to run before mine.

Mr. Austin: There may be a slight difference in your rennet test. We found last year that when we can set about 40 to

50 or 60 seconds with the Monrad Rennet Test, we can't use the other rennet test under 90.

Mr. Armitage: I don't take any milk but what I can use with my regular amount of starter. If it comes in over-ripe, we send it home.

Mr. Austin: There are times in the year that we do not use anywhere near the amount of starter that we do at others, but we always use some. If we use it one day and then destroy it we are three or four days without a starter.

Mr. Clark: Mr. Armitage said that he and his neighbor changed starters and he could not see that it made any difference. Now, I would like to know if they ever changed their apparatus for taking the Marshall Rennet Test.

Mr. Armitage: We did not, but I took a needle and tested the size of the hole in the glass plug of my test and then took it to his factory and found that the two were exactly the same size. The marks on the sides were exactly the same.

Mr. Austin: I have been working in thirty or forty factories this last season and we never could ripen them to the same point. I know of three factories within three quarters of a mile of each other, and they all have different figures for using the Marshall Rennet Test.

Mr. Noyes: I think Mr. Austin defined this starter business nicely. The starter that he uses, one per cent., is moderate, and I believe the average maker is using about 3 per cent. There is one point that ought to be understood so that cheese makers will not abuse the starter. There are so many cheese makers who claim that they cannot use the commercial starter, and it is simply because they abuse it. No one can make nice cheese with rancid starters, and if you do not know how to make and take care of a good starter, go to some good maker and have him teach you how to make it, because if you will use a pure starter, you will have good cheese. I have seen boys use 5 per cent. starters and then have sweet curds. You cannot be governed by fixing it at one per cent. or two or three per cent., you have to be governed by what milk you have to use, and when you find a man who is capable of using a starter intelligently, you will usually find a good cheese maker. I think that the people of whom Mr. McKinnon speaks—the speakers of last year—under some circumstances, would have to use a ten per cent. starter.

Mr. Austin: Where they have to use a 5 per cent. starter, I think the milk was adulterated with formalin or something else.

Mr. Noyes: No, not at all; I know it was not.

Mr. Austin: In cases where I have known a 5 per cent. being used, the milk was adulterated.

Mr. Johnson: When do you save your startoline?

Mr. Austin: We save it the evening before. That is, we add the startaline to our pasteurized milk, and after it has been thoroughly stirred in, the startoline for the next day should be taken out, put into a proper vessel and cooled down, so that the next day it is just at the thickening point We take it out before it is thickened, of course.

Mr. Wallace: Do you put water in the milk before pasteurizing?

Mr. Austin: I never had any experience diluting the milk with water.

Mr. Wallace: Do you add your starter in the morning when you first take your milk in?

Mr. Austin: That is a pretty blunt question again. That depends on conditions. We always tell our makers if it has been a pretty warm night to put the starter back. They must use their judgment in using a starter, use just the right amount.

Mr. Wallace: In the morning when I get in two or three messes of milk, I find I would rather have too small an amount of starter than too large. Some of our cheese makers turn live steam into the milk to heat it. Is that a good plan?

Mr. Austin: We think not. It may be in some cases; it would not make much difference if the boiler is perfectly clean but there are apt to be germs get in that way.

A Member: I have a practice of setting mine in deep water and turning the steam on; of course it is quicker to turn the steam in.

Mr. Austin: I woud prefer submerging the can in boiling hot water.

Mr. Van Leeuwen: I want to ask Mr. Austin or somebody else if the milk arrives at the great majority of Wisconsin cheese factories in such a condition that they can use a starter? In many places the milk is so ripe that the whey will draw in one

and a half hours with a quarter of an inch acidity. Now, could you use any starter in that milk?

Mr. Austin: We have had such experiences this summer at one factory where we wished to use the starter on account of their having undesirable flavors. In that case we had them cool the milk down as soon as it was milked, to reduce the temperature. Of course it must come sweet and if they reduce the temperature, very little lactic acid bacteria will be developed. We think it could be adjusted so that there could always be a small amount of starter used. We found in this particular case that as soon as we made them cool their milk and be very careful we could use the starter and the cheese was better and we were bothered with less gas.

Mr. McKinnon: I judge by the remarks of the speaker that he has considerable experience and is not confined to one factory, perhaps to a number of factories. The more factories he has had under his supervision, the greater amount of good he can do in this organization. Now, up in our section of the country some of us are using starters. I know quite a number of us are getting quite a lot of acidy cheese; I don't know how far these starters are responsible for this. We have been told by buyers, some of us, that our cheese was a little acidy. I knew it already myself. A buyer went around with me and tried four or five others besides mine, and they were all short, showed the acid. This buyer used a little profane language and said that the cheese showed too much acid. Now, I don't know how far the starter is responsible for this. I believe in the starter myself, but I know that cheese makers want considerable instruction. I believe the cheese can be worked in such a manner that there is no need of their being acidy; I believe that the right kind of starter will add to the flavor of the cheese, but I wish there was some way so that we could get these cheese makers to make cheese that, when they are shipped into Sheboygan or Fond du Lac, or wherever they are shipped, that the cheese buyer won't have occasion to use profane language.

The Chairman: Will you define what you mean by an acidy cheese as distinguished from a sour cheese? Some people get mixed on those two terms.

Mr. McKinnon: I do not claim to be an expert, but what I call an acidy cheese is one that when you draw a plug, it draws

rough and the curds break altogether too soon. The cheese makers like to have a plug that will bend quite a ways before breaking off short when you turn it over a little bit. I don't know what sour cheese is, although I have had some of it. What we used to call sour cheese way back in the '60s was a cheese that when you got it onto the shelf it would start to leak whey.

The Chairman: Sour cheese are made out of sour milk and you can have an acidy cheese made out of milk that you can hold several hours. Sour cheese is made out of milk so sour that you cannot control it, but acidy cheese you may get out of perfectly sweet milk. Now, Mr. Austin, what causes acidy cheese?

Mr. Austin: It is an excessive amount of lactic acid. This is a little bit out of my line, but you get too much acid before you get your cook, you develop too much acid in the whey.

The Chairman: That is, you don't get cook enough for your acid.

Mr. Austin: Either way. You get firmness before you have the proper amount of acid.

Mr. McKinnon: Too much moisture in the curd.

Mr. Austin: I think so. That is, you have a curd that is a little bit moist and perhaps it worked pretty fast and it got just a little bit too much acid. I want to say that in starting makers in on using the starter, we think it is better to use the minimum amount than the maximum, and start them in gradually.

A Member: I have my doubts about sour cheese coming because there is too much acid in the milk. The question is not how much acid you have got in your curd, but how much of the whey and the acid you leave in the cheese. Now, you can press out all the whey and it wouldn't be sour; in fact, it is not the caseine that would be sour; it is the whey which is mixed in with the caseine that would be sour. That is my idea, and I have had some experience in cheese making from the old country. It is a question of getting out the whey before we get in the cook. Now, about the starter. Last summer I used practically one-half of one per cent. starter, and my milk worked as fast as I could follow it. This winter, in December, I used at least 5 per cent. starter, and yet had to wait until it got ready, and even then I was more liable to have the curd too sweet.

When I have sweet milk and the curd is sweet, I am likely to have sweet flavored cheese. If I have plenty of acid in my milk, and cook all right, the cheese is apt to come out all right.

ECONOMY IN MARKETING CHEESE

H. J. BAMFORD, PLYMOUTH, WIS.

Mr. President, Ladies and Gentlemen: The topic assigned me is "Economy in the Marketing of Cheese." This is an important subject, but yet in these days of cheese boards, immense home trade consumption and improved transportation facilities it is not burdened with the difficulties and discouragements that the cheese manufacturers had to meet in the early years of the industry. Some of us can remember when it was a "joy and delight" to see a cheese buyer drive up to the factory.

To market your cheese in the most economical manner you should look carefully after the various details. We will assume that the cheese are properly made; but before they are cured and ready for shipment the boxes should be at your factory and thoroughly dry. Cheese boxed in wet, unseasoned boxes often reach the buyer in a mouldy and unsightly condition with the probability of loss to the shipper.

SECURE STRONG AND SIGHTLY BOXES.

See that you have a good scale with which to weigh your cheese and then give good, full weights. Many cheese are weighed on old defective scales that are not fit for any such work.

After your cheese are in the boxes cut the edge of the box down even, or a little below the cheese so that the cover will rest on the cheese. By so doing the cheese will reach their destination in much better condition. We have seen cheese that were well made arrive in a puffed and swollen condition when shipped in hot weather, owing to the fact that the boxes had

not been cut down so that the cover could rest on the cheese. If this was not important do you suppose the cheese dealers would go to the expense of trimming down the boxes before sending out the cheese? Be sure to mark poor or defective cheese so that they can be readily separated from the good ones, and where several cheese are boxed in the same boxes never put good and poor ones together whether marked so they can be distinguished or not, because the buyer has, usually, something else to do besides reboxing your cheese.

Never try to dispose of defective cheese by marking them with the same mark or brand that is used on the good ones. Treat your buyer fairly and thus establish in him a confidence in you and your methods of doing business, for by so doing you are in a position to expect him to treat you fairly also.

If possible to do so have your cheese sold on a cheese board sale for in this way you are more likely to obtain the full value of your goods, taking the full season into consideration. The cheese board sales were originally established for the benefit of the manufacturers and salesmen and you are vitally interested in sustaining them. This cannot be done by selling your cheese off the boards or by contracting them. It is poor economy to place the selling of your cheese almost entirely in the hands of the buyers. You are doubtless aware that several cheese boards in this and other states that were formerly important cheese markets, are now of very little importance as compared with what they were formerly. This condition being caused by the fact that most of the cheese tributary to such boards were contracted.

We believe, taking all things into consideration, that the call board system as now practiced in Wisconsin is the best system yet devised for the sale of cheese for all parties concerned.

DISCUSSION.

Mr. McKinnon: Mr. Bamford tells us never to put a good cheese in with poor ones, in the same box. Suppose you cut those poor cheese a cent and a half a pound, now, wouldn't the

good cheese have to take the same cut on account of being in bad company?

Mr. Bamford: As I said, the cheese buyer has something else to do besides reboxing your cheese. I have seen factory men time and time again box a poor cheese with a good one so as to save ten cents, and lose seventy-five cents or a dollar on the whole box.

Mr. Noyes: I think what created the contracting system a great deal, was the number of varieties made. They claimed everybody could not use certain hoops, and in that manner the manufacturers furnishing hoops and even boxes and circles sometimes, and giving a better price in order to get them manufactured according to the style they wished, that brought this thing about, and I don't know how we are going to overcome it.

Mr. Bamford: There are certain styles of cheese that the dealers require that would probably have to be arranged for in that way. This was especially the case some years ago, but I think now that there are cheese hoops enough of nearly all varieties so that the dealers can get what they require on the board. Of course, there may be a few special styles that will have to be arranged for, but the great bulk of the cheese could be sold on the board; but I have special reference to standard styles.

A Member: How about print cheese?

Mr. Bamford: There is any quantity of print cheese.

A Member: Wouldn't you have to use the buyer's hoops?

Mr. Bamford: No, buy your own hoops, put the cheese on the board and see how quickly you would get an extra price on them.

The Member: They woud take the hoops away from you.

Mr. Bamford: I mean buy some hoops, be independent.

Mr. Curtin: Don't you think it would be a better plan to have a cold storage building in a small town and have all the cheese taken there and pay a man for taking charge of it? And let him sell that cheese and let the buyer come there and inspect the cheese. On the board a man that makes good cheese gets exactly the same price as the man that makes bad cheese. I believe in selling it for what it is worth. Have a central cold storage and let the buyers come there. As it is, we sell our cheese down in Chicago or some other way, and we are out.

One of my neighbors lost $1,900, and it broke him up in business. I think we should have a central cold storage, put our cheese there and sell them there and get our money for it, just the same as the farmer hauls his load of grain to market and gets his money.

Mr. Bamford: This gentleman must have had extra good success in selling his cheese, and it must have been extra good cheese. If he had made any poor cheese and tried to sell it on the board, he would find the difference.

Mr. Noyes: Can we get good strong, sightly boxes whenever we need them?

Mr. Bamford: I said to procure strong, sightly boxes, the best you can get. In the cheese we handle we see a great difference in the quality of the boxes. Some are good and some are not, and the poor ones ought not to be used.

Mr. Noyes: What are you going to do when you are glad to get any at all?

Mr. Bamford: It seems to me that a man who is looking after the details of his business, will arrange for his boxes before he commences to haul. He should never run out of boxes, nor should he put in green cheese. Sometimes we have seen cheese in boxes that are blue moulded all over.

Mr. Noyes: Even Mr. Bamford could not have bought boxes the latter part of this summer for love nor money. I ordered boxes six and eight weeks before I got them, and in that time you couldn't either buy, steal or beg them, and when we did get them, they would be just out of the vat, and we had to pay fifteen cents for them.

A Member: The gentleman suggests that we have our own hoops and furnish our supplies. If we do that, we ought to get more out of the cheese, and I don't believe we could. We can't make a 10-pounder for what we can make a 30-pounder. The idea is if we sell on this board of trade are we guaranteed our price for what it costs to manufacture those small cheese? We have got to have a guaranty when we sell on the board of trade in order to have what it costs. It costs more to box for some kinds of cheese, it costs more bandage, it costs more of everything, except the solution, your cheese in the vat. We must get what our cheese is worth to make according to the shape we

make. I have had this contracting shot into me all summer and I would like to hear it discussed.

Mr. Bamford: Can't you arrange that at your cheese meeting, when you arrange your terms by which you are to make your cheese? If you are to make small ones, and it costs you more, the farmers certainly should pay you more. The manufacturer should have his fair pay for whatever style of cheese he makes.

The Member: The farmer won't do it.

Another Member: Sure, he will.

The Member: They don't down our way, because they expect a half a cent more than what they get for twins, and the makers can't really make it for that, they have got to have a cent a pound more. There was a time that Cheddars sold just about the same as twins did.

Mr. Curtin: If you don't get paid for making, it is because the neighborhood don't hang together, and one man fights the other. If you factorymen cannot hang together, you must expect to be money out of pocket.

A Member: I want to ask the gentleman if he has ever bought on the board of trade by sampling, I mean cheese being brought there and plugged; or is it customary with you buyers to come there to start up your sale, quote the price, the cheese maker goes home contented and ship the cheese to that point. Then you inspect the cheese and send in the returns. That is the condition, isn't it, on the board of trade?

Mr. Bamford: The factory man offers a certain amount of good cheese on the board. Some cheese are inspected at the factory and some not, it is done both ways.

A Member: I am unable to see what benefit the board of trade is to the cheese producer unless it is for a day to meet and have a good time.

Mr. Scott: If the gentleman would go on the board and see the buyers bid against each other, he would see how it is done. We are supposed to sell first class cheese. If they are not first class Mr. Bamford, nor anybody else, will buy them.

The Member: Is any cheese offered to bid on?

Mr. Scott: No, we list first class cheese.

The Member: It is to be inspected after it is shipped?

Mr. Scott: On our board, it is to be inspected in Sheboygan county.

The Member: I heard a remark this morning from the President of this association which I thought was the most appropriate that I have heard in a long time; it was, that it was a good plan to get the three elements together, the buyer, the cheese and the seller.

Mr. McKinnon: If the cheese didn't turn out to be what the cheese buyer expected, he and the factoryman would come together for consultation. We can't palm off poor cheese onto these cheese buyers. They are pretty good judges of cheese, some of them a little better than I wish they were, and when they tell us in our county that our cheese are off flavor, if we follow up those cheese, ninety-nine times out of a hundred, we will find they are as the buyers represented.

Mr. Curtin: You are very fortunate to be where you can follow your cheese. We can't do it, we are further north. Understand, I am not trying to insinuate that the buyers are dishonest, or make it appear that the manufacturer wants to palm off something that is inferior, but these conditions we have; it is immaterial whether you pay 15 cents or 7 cents, the cheese net us just so many cents a pound when they get to their destination.

Mr. Van Kirk: If the cheese does not come in in good marketable condition, I understand you do not pay the full price for them.

Mr. Bamford: Naturally.

Mr. Van Kirk: Do you ever pay a premium on cheese that are better than the average? If you get a fancy lot of cheese, do you pay that man more than you bid on them?

Mr. Bamford: The price that is paid for cheese on the board is usually as much as the finest cheese is worth.

Mr. Van Kirk: But when you get a poorer cheese, you can limit the price that you pay for them, I have to take your price.

Mr. Bamford: You can accept our price or sell them to some one else.

Mr. McKinnon: I believe that they do pay a premium on the very best goods in this way: We put up our cheese on the board and it is sold to the highest bidder, but if I had a reputation of making the very best cheese that is made in Sheboygan

county—I don't have that reputation just now—but if I did have it I would get a bigger price for the cheese. I have in mind certain factories that the cheese is uniformly sold to the highest bidder, and very often they will lead us a quarter of a cent, and more often an eighth of a cent. That is the premium upon good cheese over and above the ordinary price.

Mr. Wallace: If I had cheese that was not quite as good as yours, but had twice as much of it, I would be apt to get an eighth of a cent more.

Mr. McKinnon: I think not. That is, for the last two months, the smaller amount of cheese a man had, the better price he got.

Mr. Curtin: If we factory owners throughout the state of Wisconsin had at different points good substantial warehouses, such as would be equal to a good curing room, and store our cheese there weekly and have you buyers come along and buy those cheese and pay us for them, I think that would be all right. I don't mean to say that you would pay us cash on the impulse of the moment, but you could look at the cheese, you would say those cheese are worth so much and no more; these other cheese are worth a little more, and there is a body of cheese that are A No. 1, and they are worth still more. Wouldn't that create an inspiration among cheese makers to bring a better cheese to market? Every man would try to do better after he saw how it worked, and he would be contented; the buyers could explain that such and such cheese were off and everybody would be satisfied. Now, wouldn't you consider that a better way of buying? I want your opinion on that.

Mr. Bamford: On our cheese board, where we sell on the call board, those factories that are known to be good, whose cheese are uniformly good, are generally the ones that get the first bids. It is a fact that there is a premium paid on good cheese in that way. Those factories that are known to run rather poorly, the buyers don't strive to get those cheese. Now, as far as selling at central stations where the cheese could be concentrated, as far as I am concerned, I would be perfectly willing to do that. I like to see what I buy, and as a buyer I believe that by doing away with the cheese boards, and buying in the way you suggest, I could buy my cheese cheaper.

Mr. Andrus: I have always noticed that what the cheese buyers want, most of us factorymen better not have.

Mr. Clark: If you did away with the cheese boards, would you do away with any of the buyers?

Mr. Bamford: I don't think you would.

Mr. Clark: How could you buy your cheese any cheaper? It is the buyers that make the price.

Mr. Bamford: There would not be the competition that there is now. As it is now, you get a body of cheese buyers together, and some of them get a little bit hot and the prices run up a little bit, and if you only had one at a time, or two or three, they would arrange it easy enough so that the price wouldn't be quite so high.

Mr. Curtin: Couldn't we take advantage of the cheese buyers and inspect the cheese?

Mr. Bamford: Yes, you could do that.

Mr. Clark: Wouldn't it be possible, if we had a central station, to store the cheese until we could get a price to suit us.

Mr. Bamford: The question then with the manufacturers would be as to holding the cheese as you thought best.

A Member: Don't you think a central storage would be the best plan, I don't mean cold storage, but just for a few days for merchantable goods, ready to sell. If we could get the buyer to come there and inspect our cheese. Then we would have a market right there, and if any question comes up, the cheese is right there and not way down in Chicago where we can't get at it, and where we can't afford to run down there, and we might as well let them have them at their own price.

Mr. Clark: That was the idea I had. This gentleman speaks of the producer getting the benefit of it when the buyers get a little hot. It doesn't work that way. It is we that get the worst of it.

Mr. Bamford: If your cheese are good, you get the full price bid on the board for them.

Mr. Clark: I have hoped so, but sometimes I have thought not.

Mr. Noyes: If your cheese is inspected in the factories or in a central warehouse, they will be cut if they are not good cheese. We buy a lot of cheese from the cheese makers, and they tell their salesmen, who have no means of knowing anything about

them, that they are first class. Then when they get down to Chicago, the man down there finds that they are not anywhere near first class. It would be a great deal better for the buyers if they are inspected right in our neighborhood, and then they know before they get away and find out about the cheese makers who are not honest in their representations.

Mr. Oberlin: I sell on the board at Plymouth and my cheese has brought an eighth of a cent more on the board than anywhere else. The fact is that when the cheese is all right there is no kick coming. I don't believe there is a buyer there but what will do what he agrees to when the cheese is right.

Mr. Wallace: I think that most every cheese maker has buyers who will use him O. K. if the goods are all right, but the trouble is that buyer won't buy his cheese all the time, and every now and then he won't be at the board, and some other party will bid on his cheese, and especially, if he is a small dealer and the market goes against him, you are going to get the worst of it.

Mr. Bamford: You can remedy that by instructing your salesman not to sell to buyers that you don't care to have your cheese sold to, if you are not able to be there yourself. That is frequently done on the board. It is in your hands. I wouldn't sell my cheese to a buyer I didn't have any faith in.

Mr. Clark: In this central storage idea, according to my suggestion, there must be some good cheese, and you have got the cheese to show, and to compare with that which is not up to standard. You can talk it over with the buyer, and he can tell you why your cheese won't sell for as much as this other man's. If we don't know what is the matter with our cheese, why it is not first class, we don't know how to make good cheese. I believe in the personal contact.

Mr. Scott: Any cheese maker ought to know what kind of cheese he is shipping. He can go to the board and meet the buyer and talk it over. Going back to the old contract system a man would not have the benefit of meeting all these buyers, nor that opportunity for sociability. The board of trade in our country is the cheese makers' Sunday, and the cheese maker ought to know before he goes there whether his cheese is fit to be shipped out. On board you can sell subject to inspection in the factory, and you have the cheese in your own hands.

Mr. Clark: The gentleman over here remarked that the board of trade days are the cheese makers' Sundays. The cheese makers in our country don't have any Sundays, they can't get away and go to the board of trade. We have a salesman in our factory, and I don't think he knows anything about Sunday. We have to sell our cheese on board of trade prices and they are not inspected until they are shipped out of the factory, and if that man at the other end says our cheese are off, there is nothing we can do. The cheese maker can't get away to go and look at those cheese. We have no redress. We wanted to put a private mark on our cheese this summer, and they wouldn't buy it if we did so.

Mr. Noyes: We can't settle this question, it is impossible; it never can be settled until you put every cheese maker on a first class basis. If every cheese maker will make first class cheese every day in the year, he will get his price every time. He must be honest about it.

Mr. Clark: You have got to make the buyers honest first.

Mr. Noyes: The cheese makers have got to be honest, too. We have cheese makers who will go all through their season and never have a cut. I can put my fingers on a good many boys right in this house today that haven't had a cut this year, and they have no fault to find with the cheese buyer, and there hasn't been a buyer to some of their factories this summer. Their cheese have all gone forward and they have all got their checks in full right straight along. I don't know any way to remedy this matter better than to have every boy put up first class cheese, and then you will find there will be very little trouble.

Mr. Curtin: Isn't it a fact that the very best cheese makers make poor cheese at times?

Mr. Noyes: Very seldom, sir.

Mr. Curtin: But it is a fact that it occurs sometimes?

Mr. Noyes: Yes, sometimes, I will admit it, but when that cheese maker finds he has got a poor cheese, he will mark it so that when the boxes are piled up in the warehouse, it will be put off by itself, and the mark on it right plain, so that you can stand there and pick it right out, and the buyer will tell him what he will give for that cheese, and if the maker feels all right and knows the quality of his cheese, he won't have any trouble in selling those off cheese.

Mr. Curtin: It is still true that good makers do make poor cheese at times. We have shipped out two lots of poor cheese from our factory, and only two.

Mr. Noyes: That is a good record, and I will venture to say you had no trouble selling them.

Mr. Curtin: I still am not convinced by Mr. Bamford's statement, or anybody else's, but believe that the cheese buyer and the seller should be together with the cheese.

SEPTIC TANKS OR SUBEARTH SEWAGE DISPOSAL.

MATTHEW MICHELS, GARNET, WIS.

What I have to say is merely about septic tanks, as I have had no experience with the sub-earth disposal of sewage, i. e., to have the earth take up all the sewage from a system of tile, laid under ground from the septic tank. My experience has been only with the septic tank, and has been so successful, that I have not as yet had any desire to put in the tile.

It was after our convention, January 8 to 10, 1902, that I commenced thinking very seriously of that most valuable paper read to us at that convention by Prof. Archibald Smith of Ontario, entitled "Cheese Factory Sanitation" in which he gave a very lucid explanation of all the details of construction, as well as the principles of sanitary science.

Mr. Joseph Bost, of Stockbridge, had some trouble with the disposal of sewage and he concluded trying the septic tanks. He made an excavation 10x12 feet, and 5 feet deep and enclosed the same with a stone wall, with a partition running through the center. The waste from the factory emptying into the first tank was siphoned into the second tank, and from there again siphoned into a series of tile.

This means of outlet extended over a distance of about 40 feet, and emptied into a ditch.

Being thoroughly satisfied with the results of Mr. Bost's experiment, I decided to build a tank at my factory at Garnet,

Wis., where I have a whole lot of waste water to contend with, being somewhere in the neighborhood of forty barrels per day. I proceeded as follows: After digging a well 12x14 feet, and 5½ feet deep, I built a wall around it but did not put in a partition, leaving this as one tank. A string of sewer tile with a trap near the factory carries the waste water into the well, wherefrom it is siphoned out by a three-inch gas pipe extending to within 10 inches from the bottom of the tank into a series of sewer tile about 80 feet long, and empties the water into a creek.

The tank mentioned above holds about 130 barrels of water, or more than three times as much as the waste water amounts to in one day. After I had completed this tank, I built a cover over it of two thicknesses of ship lap, and had it raised sufficiently at one end to allow the water to run off, and then I banked all around the tank with ground and gravel.

The waste water contained in the tank was covered with a scum from three to four inches thick, last summer, but the water running from it was perfectly clear and caused no trouble whatsoever when it emptied. Formerly we were considerably annoyed by the smell caused by the waste water which was noticeable not only in the immediate surroundings, but also at the barn and house which were located quite a distance from the tank, and even the neighbors were continually complaining.

I have not as yet laid the tile suggested by Professor Smith, for I was afraid that their capacity for water would not be sufficient and also, I feared that the ground would not absorb the waste water very readily. In my case, it is not necessary to put in the tile, as the creek flushes everything clear after a rain.

I am strongly in favor of a septic tank, and would not be without one, especially after my experience with one last summer, and I also believe that by adding the tile it would be a great improvement.

For the average cheese factory, a tank 4x8 and 3 feet deep would be large enough, and where the stone quarries are not located too far away, I think it would be advisable to use stone in place of wood for the walls.

A septic tank constructed on the above principles would last a life time, and taking the price into consideraton, even should it be desired to use the tile, would be in the reach of all.

DISCUSSION.

Mr. Graskamp: Do you ever empty that tank?

Mr. Michaels: No, I have it only one year. The first tank I have used nearly two years. The outlet is about ten inches from the bottom, and I think it will be a long time before it will ever fill up. The heavy settlings will settle at the bottom, and the lighter material will go to the top and ferment there. It siphons about ten inches from the bottom of the tank through a three-inch gas pipe.

Mr. Brewer: How near is that tank to your factory?

Mr. Michaels: Only about a rod from the factory, but you could put it right along the side of the factory. It does not cause any trouble, it is covered up, air-tight.

A Member: Is there no chimney leading from that tank?

Mr. Michaels: I have a gas pipe, but it doesn't do much work; everything is covered.

Mr. McKinnon: But in the course of years, those tanks will have to be cleaned out, won't they?

Mr. Michaels: I don't know. Professor Smith told us they ought to be cleaned out every year, but I didn't want to clean it out every year, so I made a large one. I think one without a partition works about as well as one with. We have had a lot of comfort from ours, and no smell at all, whereas we used to be bothered a good deal when the wind blew in a certain direction.

Mr. Dewhirst: In many places these septic tanks are cleaned out once or twice a year and a little lime is added when they are cleaned out, and the smell from the substance in the tank is hardly offensive at all, even after the substance has accumulated for six or twelve months. The lime is added principally to check fermentation and to destroy any offensive odors which may come from the settlings. As a rule, they are not offensive until they are stirred up, and then the lime is added.

Mr. Michaels: I think it is all right to add the lime at the time you are cleaning, but not at any other time, because we want the bacteria to grow in there and eat up this material. By adding lime, you kill off the bacteria. The only thing you will have to clean out is the heavier settlings at the bottom. This scum over the top, I believe, that in the course of a year more,

it will be all wasted away and there will be nothing left of it, and even now it looks in some parts of the tank as though it was growing less. In the summer it was as much as five or six inches deep and hard as leather.

Mr. Bruhn: Then the longer it stays in there, the more the bacterial growth will increase?

Mr. Michaels: Yes, that is the way Professor Smith gave us to understand in his paper.

Mr. Bruhn: Would it be safe to run whey in there, cleanings from the whey tank?

Mr. Michaels: Yes, I think so. I don't think it would be anything worse than what I have been running into mine the past summer.

A Member: Does the pipe siphon all the time, or does it work with a valve and empty it out when it gets full?

Mr. Michaels: It works only when the water is run in at the other end. You see when the tank gets up so full, it siphons it up from the bottom, and out. Mine runs into the creek.

Question: It empties out frequently, does it not?

Mr. Michaels: The tank is full all the time.

A Member: I saw an article a while ago where it said it would be better if you emptied the tank frequently; then leave it stand till it fills up again.

CHEESE FACTORY ACCOUNTING.

FRANK DEWHIRST, MADISON, WIS.

When our worthy Secretary informed me recently, in that calm, cool way of his, that my name had been placed upon your program with "Cheese Factory Accounting" as the subject, I wondered why such an infliction was placed upon both speaker and hearers.

At any rate, he might have assigned me a subject of less audience dispelling power than that of the cold figures implied by such a subject. It takes the persuasive eloquence of a Rock-

efeller or a Morgan to make figures "speak," and even then in rather uncertain tones, as many a Wall street "lamb" can testify.

However, the question of accounting in cheese factories is an important one. Carelessness and lack of system in this connection have certainly caused many failures in this industry, as in all other mercantile lines.

I do not think that it can be denied that many cheese factories have no proper system of accounts, and financial transactions are recorded, if recorded at all, in a slip-shod, hazardous fashion.

To keep a simple set of accounts which will show the condition of the business at any time is not of such a difficult nature as to appall any individual of ordinary common sense.

Rather will such accounts prevent the nerve-destroying search for a balance, when the various items have to be collected from scraps of paper, pencil marks on the walls or boards, and even from the memory of the cheese maker.

The first necessary account is a capital account, and this should be credited with all items of investment for buildings and machinery and should be debited with all items of depreciation.

At this point, I will say that especially in coöperative factories a serious mistake is made by not allowing, out of the profits, a liberal amount for depreciation. A careful inventory should be made, at least once a year,—the building and all equipment to be valued at actual worth,—apart altogether from the original cost.

Many a factory has distributed all its earnings as fast as made, taking no thought of the lessening value of the property, and the result has been the practical loss of the invested capital.

A carefully kept cash account is required, and to this account all receipts of money are charged, and it is credited with all expenditures. This itemized account will often show where unnecessary expenses have been incurred and enable a more careful scrutiny to be made of incidental charges.

Accounts must be kept with the customers of the factory, and when a shipment of cheese is made to any firm their account should be charged with the weight shipped. Where sold on

commission, the price can be left vacant, to be filled in when the returns are made.

A separate account is needed for every patron of the factory and each should be credited with the amount due him for milk delivered in whatever form the milk is bought. Any purchase made by the patron will, of course, be charged against him, to be taken note of when the check is made out for milk supplied.

I will not detain you longer with this part of the subject, as the methods in use for keeping a simple set of books—suitable to cheese factory conditions—can be easily acquired from any of the numerous elementary works on book-keeping.

The main object of this paper seems to be more along the line of how to equitably pay for the milk bought by factories.

I think that you will agree with me that the old method of pooling the milk and paying at the same rate per hundred pounds, irrespective of quality, is not an equitable method.

The work of Babcock, Van Slyke and others has shown that the fat content of milk is the determining factor in its value for cheese-making.

The yield of cheese is practically proportional to the amount of fat in the milk,—within the limits of the ordinary variations of normal milk,—and the price of cheese is measured by its fat content.

It is then manifestly unfair to pay as much per hundred pounds to the patron having milk testing 3.5 per cent. as is paid to the one whose milk tests 4.5 per cent.

If this is conceded, the percentage of butter fat in the milk is the true basis for payment in cheese factories, as well as in creameries.

Payment for milk on the basis of its fat content has been widely adopted in creameries and there are good reasons why a similar method of payment should be used in cheese factories.

To pay by this method, each day's milk should be sampled at the intake and the composite samples thus secured can be tested at intervals of ten days or two weeks. The various tests for one month added together, and the total divided by the number of tests, will give the average test for the month.

By multiplying the weight of milk delivered by the average test, and dividing by 100, the weight of fat in the whole month's milk is found.

What the price is to be per pound of butter fat will depend upon the sum realized by the sale of cheese.

From whatever sum the cheese brings, the charge for making should be deducted if the factory is conducted on that basis, or, if a co-operative factory, an amount sufficient to cover cost of making, depreciation, and incidental charges should be deducted.

The balance remaining is available for distribution, and its apportionment among the patrons can be readily calculated.

To illustrate the method of division, I will assume that a factory has disposed of 15,000 pounds of cheese at ten cents per pound—the make of a certain month.

The cost of making, commissions and freight have absorbed $225.00, or a cent and one-half a pound; $15.00 is written off to depreciation,—leaving a balance of $1,260.00.

The milk receipts for the month have been 150,000 pounds, and the average test has been 4 per cent. I use round figures because they are easier to demonstrate.

This makes the fat received for the month 6,000 pounds.

Now, the cheese has netted $1,260.00, and this is the amount received for 6,000 pounds of fat, or twenty-one cents ($.21) per pound of butter fat.

If patron "A" has delivered 2,000 pounds of milk, having an average test of 3.6 per cent., the fat content is 72 pounds and he is entitled to receive seventy-two times twenty-one cents (72 × $.21), or fifteen dollars and twelve cents ($15.12). This makes the price per hundred pounds of milk twenty-one times 3.6 or 75.6 cents.

The account may be made up from the cheese value of the butter fat.

Fifteen thousand pounds of cheese has brought $1,260.00, one pound of cheese will be worth 8.4 cents.

Now, taking patron "A" again, his butter fat, 72 pounds, will make $\frac{72 \times 1500}{600} = 180$ pounds of cheese. 180 pounds of cheese at 8.4 cents per pound equals $15.12.

The first method is simpler, and has the advantage that much less calculation is required.

A statement should be given to each patron, with his monthly check, and such statement ought to include such items as:—

Weight of milk received from all patrons .....

Average test ..... Weight of fat received .....
Pounds of cheese made .....
Price of cheese per pound, realized, $.....
Cost of making, $..... Net price paid patrons, $.....
Patron's weight of milk ..... Average test .....
Total fat ..... Price per pound of fat, $.....
Amount due patron, $.....

DISCUSSION.

Mr. Dewhirst: If there are any of our Canadian friends present here, there is an opening to bring in the argument made by Professor Dean of adding two to the test, to get nearer the true value of the milk.

Mr. Anderson: I am not a Canadian, yet I cannot agree with the claim that is made that the butter fat in the milk is the correct basis for paying for milk in a cheese factory. In the first place, the Babcock test must be used. The farmer who has the 4 per cent. milk may skim off enough cream to make it 3 per cent., which comes within the law, but, of course, if the lactometer is used with that, you can tell. Now, suppose a factory agrees to pay on the basis of the butter fat in the milk, one farmer has a Holstein cow; that milk makes a low test. He would take the night's milk and skim, and give the skim milk to the cows; he will keep the cream till the next morning and put it in the milk and fetch it to the factory, and if the factory pays according to the butter fat, we don't get the milk we ought to have, and yet that farmer would be within his rights as long as we say that the butter fat in the milk is the whole thing. In creameries the butter fat is the whole thing, but when we make cheese, the casein comes in, and we can't make cheese without it. As far as our experiments at the Dairy School go, it proves that we do not get cheese in proportion, but, as Professor Babcock says, if we do not get cheese in proportion, why, the cheese we do get from the richer milk is richer cheese, and it will sell for more money a pound. Now, the fact is, we do not get more money from that. Many men can

not tell the difference, providing the cheese is made from whole milk, and if we do not get any more for it in the making, it isn't right to pay more for it than for a lower testing milk.

Mr. Dewhirst: Taking Van Slyke's investigation, he says, "The average pounds of casein for each pound of fat in the milk testing 3 to 3½ is .66; 3½ to 4 it is .66; 4 to 4½ it is .65; 4½ to 5 it is .64, a difference of over .02 from normal." He also says, "Recent research has shown that for milks containing a normal amount of fat the yield of cheese will be nearly proportional to the percentage of fat in the milk." It is a fact that good milk makes cheese more valuable for sale purposes than cheese made from skim milk.

Mr. McKinnon: We start out with the proposition that skim milk will make between five and six pounds of cheese—call it cheese or what you like, it will make that much skim cheese. If you add one per cent. of fat to it, it will make one pound of cheese and a fraction more, and it will keep on so doing till you get up about to 4 per cent. Now, when milk is worth $1.00 a hundred, 3 per cent. milk would be worth three-quarters of a dollar; 4 per cent. milk would be worth a dollar; therefore, the additional one pound and a fraction of a pound that is added to the weight of the cheese, for that we get twenty-five cents if you pay on the straight test, but if you pay as Mr. Anderson pays, or as Mr. Dean pays, you add two per cent., lessening the value upon that additional pound nearly one-half or one-third. Now, I claim that the difference between 3 per cent. and 4 per cent. milk can in no manner be made to equal twenty-five cents in any market, nor with any cheese buyers that are buying cheese, nor it cannot be made to produce that additional twenty-five cents. I am in favor of paying by the test, but I believe there is a fair medium somewhere between that artificial rule and the way that is often done. The fat adds to the quality of the cheese, we are all aware of that; the caseine adds to the amount, and the caseine should have a value. Now, it is fair to say that the caseine in that milk shall have at least two per cent. of the money and the additional shall go to the percentage of fat. I believe that to be strictly along the lines of honor and fair dealing, and I have given this question considerable thought.

Mr. Noyes: Don't you think the butter fat increases the yield?

Mr. McKinnon: Certainly it does. I said the casein will give us between five and six pounds of cheese. Now, we add, and for every additional pound of butter fat, we get an increase, of course, in the amount of cheese that is produced, and that is all right. It adds to the quality of the cheese, but there is no such a thing as saying that 2 per cent. milk should be paid 50 cents and 3 per cent. milk should be paid 75 cents, and 4 per cent. should be paid $1.00; there is no consistency in it, because you are paying 25 cents for an additional pound of cheese and a little over, that you get from that between the 3 and the 4 per cent.

Mr. Marty: There was a member who said here that he was in favor of the Babcock test applied to cheesemaking. I wish to call that member's attention to the fact that there are other kinds of cheese made in the state than American cheese; we have Swiss and brick cheese. Now, if your test is higher in the milk delivered at the factory, no matter what fat we obtain from the milk and get into the curd and whatever loss there would be from the same fat, it can be made into butter. This question of applying the Babcock test would certainly be out of place in the Swiss cheese industry. Now, in order to give patrons confidence in the cheese maker, what would Mr. Dewhirst recommend? Would you advocate that they start with the Babcock test?

Mr. Dewhirst: I will not take into account the question of 2 per cent. milk, because that is not normal milk and no such milk is delivered at the factory. I would take the same weight of milk of 3, 4, and 5 per cent. butter fat and I would make a cheese from it, and notice the difference in the size of those cheese, the difference in the weight, and that would demonstrate to the eye of the patron the increased cheese value of milk with the higher per cent. of fat. At the school we had several different cheeses made, running from skim milk up to 5 per cent. milk. We do not eliminate the casein in buying by the butter fat test, because the casein in the milk increases in practically direct proportion to the fat, so there is no necessity to offset the casein because the casein itself increases, and I will show that by again referring to Van Slyke. He states "that as the

percentage of fat increased the percentage of casein increased in nearly constant ratio." If we had a short, rapid and accurate method of determining the casein, then the casein added to the fat value would then absolutely give the cheese value, but by the Babcock test alone, with normal milks, milks from 3 to 5 per cent., the Babcock test gives it so nearly accurate that it ought to account for the casein also. Now, there is another point in regard to a man skimming his milk. Mr. Baer might object to this as the assistant dairy and food commissioner, but as far as the factory is concerned, it makes no difference to us. We pay by the fat alone, and if he abstracts a portion of the fat in the cream, he takes out a larger per cent. of the fat than he does of casein, and he is really cutting his own throat by leaving more casein in that milk than the milk would normally have. Now, in regard to adding 2. When a man has 200 pounds of 5 per cent. milk, that is 10 pounds of fat, and we add 2, it makes 2 times 7 or 14; he adds 100 pounds of water to his 100 pounds of milk and brings down the test to a little over 3. We add 2 to the 3, 3 times 5, he is paid for 15 pounds instead of 14 pounds, which is a direct inducement to watering. It is offering a premium to the gentleman who is watering his milk, and is liable to come under the jurisdicton of Mr. Baer.

Mr. McKinnon: It would be fair to add this: If you have a set of patrons that are bringing you 4 per cent. milk and you made that up separately in a vat; and you had another set of patrons who are bringing you 3 per cent. milk, and you paid strictly by the Babcock test, by the butter fat, would there be 25 cents in favor of the 4 per cent. milk, over and above the 3 per cent., providing they were made up equally skillfully? I think that is not the case. I think the variation is considerable, but it is nothing like one-quarter. I think you will do pretty well if you will convince the little minority here that one additional pound of fat is going to add two and a half pounds of cheese.

Mr. Noyes: One pound of butter fat will make two and a half pounds of cheese, or more.

Mr. McKinnon: If you have 100 pounds of skim milk, it will give you six pounds of cheese. Then if you add an additional two pounds of fat, you will get eight pounds and a half of cheese, won't you? Then, for the next additional pound,

bringing it up to 3, you get 5 pounds, then you bring it up to 4, and you get 10 pounds.

Mr. Dewhirst: In all the gentleman's figures, he assumes that 100 pounds of skim milk will make 6 pounds of cheese, but skim milk is not normal milk, and if the casein could be taken out in the same ratio as the fat there would be no cheese-making value.

Mr. McKinnon: I have made hundreds and hundreds of pounds, I know whereof I speak.

A Member: How much was your cheese worth, made out of this skim milk?

Mr. McKinnon: I am out of that argument right away.

A Member: I think that would be the right way to get the value. If you add four pounds of butter fat to the six pounds of skim cheese, it makes a lot of difference.

Mr. Dewhirst: This is not germane to the question at all; we are not talking about skim cheese.

Mr. Singleton: Mr. Dewhirst is right. Prof. Dean's is not an arbitrary rule. He found that by adding two per cent. to the fat it represented the available casein and it did come nearer the cheese-producing value of the milk than to test the fat alone. I have looked over Van Slyke's work, and I know it is a very strong argument in favor of paying by the fat alone. It is a stronger argument than Dr. Babcock makes.

Mr. Dewhirst: Upon this point Van Slyke and Dr. Babcock agree. Van Slyke in his work claims there is an increase of practically 2.7 per cent. within the range of normal milk; that there is a uniformly increasing cheese yield; that the casein increases in almost direct proporton to the amount of fat in the milk: In regard to the work of Prof. Dean, is it not a fact that the work of other investigators has not confirmed Dean's work?

Mr. Singleton: The point I want to make here is that you get a better yield for your work than we do, you make a moister cheese and we cannot compare investigations made in Canada and here.

Mr. Dewhirst: So you think that under our conditions that the Babcock test would be a fairer method of paying for the milk than the test plus 2?

Mr. Singleton: I am not prepared to say that. It might

come nearer the yield, but Prof. Dean, in his experiments, showed that his method was nearly correct for Canadian conditions where we make a dryer cheese than you do here.

The Chairman: Is Prof. Barr in the room? We would like to hear from him.

Prof. Barr: I do not wish to say very much on that subject. It always struck me with regard to Prof. Dean's experiments, that they were done along practical lines, the cheese were made from milk and the records kept and he found that the actual amount of cheese made, in fact, corresponded very closely with a 2 per cent., and I might say that those cheese were scored by some of our best experts in Canada, and there was no difference noted in the quality of the cheese, averaging the total scores, there was practically no difference in the quality of the cheese made from the 3 per cent. milk and the 4½ and 5 per cent. milk. I might say that all of our factories over there that are paying by the Babcock test are not adding the 2 per cent., some are and some are not, so that it is a matter of opinion over there, as well as here.

Mr. Anderson: I don't think it fair at all to compare full cream cheese with skim cheese, in order to find out the right way to pay for full milk, which comes, as a rule, between 3 and 5 per cent., and the bulk of it comes between 3 and 4 per cent. Now, in regard to the yield. The most reliable figures I have seen are those in the records of the Dairy School; Prof. Babcock gathered those figures from 347 factories. I have seen the figures printed. He picked out between twenty and twenty-five, running from 3 per cent. to 3¼ per cent. fat. In that kind of milk, the yield was 2.95 of cheese to one pound of butter fat. Then he picked a couple of dozen of the highest factories, and there one pound of butter fat would give 2.45 pounds.

Mr. Michaels: I was in that same test at that time. My figures showed that I could make 2.77 pounds of cheese from 1 pound of fat. Today I can't do that. It was simply because at that time I did not test as high as I do today, and those low tests are not a comparison with the high ones.

Mr. Wallace: And were not those figures taken in the spring when we were making soft cheese, that was intended to go onto the market very quick.

Mr. Anderson: If you take cheese made from milk at the

same factory, if that is made soft, the same factory would make the same amount of cheese. In 1900, the Wisconsin School made cheese from different per cents. of milk. They sent part of that cheese to the Paris Exposition, and I understand they got a gold medal for the cheese. The figures were given there of the yield from the different per cents. of milk, 3 per cent. milk was 9.15. According to that 4 per cent. milk should go over 12 pounds, but at the same time 4 per cent. milk made at the same dairy school made less than 11 pounds of cheese. A year ago last fall the Dairy School had cheese exhibited at the State Fair at Milwaukee, cheese made from 3 per cent., and 4 per cent. milk, and 5 per cent. milk. The 3 per cent. milk made 9.2 pounds; the 4 per cent. milk made less than 11.

Mr. Michaels: I think Mr. Anderson is leaving out a valuable point there. He does not state that this milk in the first place was skimmed down to 4 per cent., wasn't it?

Mr. Anderson: No, it was made from farmers' milk as it was brought in. I am in favor of paying every farmer what his milk is worth, but I think we should by all means find out what the different per cents. will give in yield. Now, in scoring cheese, flavor is 45 points. That should be considered in this connection.

Mr Dewhirst: I don't think the Wisconsin Experiment Station claims that those cheese at the Paris Exposition were made from milk with the percentages of fat stated. In all those cases, we did not attempt to determine the exact yield, it was merely to show that there were differences. We skimmed some milk entirely. In another case we left one per cent. of butter fat; in another case, we left two per cent., and another three, but in taking out the fat, we left an undue amount of casein, which has increased the apparent yield of the lower test in the milk and the lower test in cheese. We did not take into account the difference which was made in the casein contents by the centrifugal skimming, but we showed the point we were trying to get, namely, that the yield of cheese is dependent upon the amount of fat present in milk.

Mr. Mason: I have a resolution which I wish to offer this afternoon as follows:

"*Resolved*, by the Wisconsin Cheese Makers' Association, in convention assembled, That the *Cheese & Dairy Journal*, published by G. W Rankin of Milwaukee, be, and the same is, hereby designated as the official organ of this association."

On motion of Mr. Curtin, duly seconded, the consideration of the resolution was postponed until the next afternoon (Thursday, Jan. 7).

WHAT IS A FAIR COMPENSATION FOR MAKING CHEESE?

DISCUSSION LED BY HENRY VAN LEEUWEN, TOPEKA, KANSAS.

Mr. President: I guess that the cheesemakers will say that a fair compensation is all that they can get the owners or the farmers to pay them.

Of course, what the cheese maker is worth depends entirely upon the cheese maker. As superintendent of a system of factories, I have known of makers that were worth $5, $10, $15 or $20, or perhaps more, per month, than other makers, and to lay down a set rule as to what a maker is worth is a difficult matter; indeed, it is an impossibility. I do not believe we can say to a set of men you are worth so-and-so-much and no more, but at the same time I believe that we can have something to base our calculations on as to what a man is worth. I don't know why I am called upon to discuss this topic, unless it is that I have a plan of paying at our factories which we think is very nice and satisfactory to ourselves, to the patrons and all, and that is a schedule, based upon the amount of milk received at the factory. Operating thirty-one factories, we have of course older men and others who are new, and so the new man always has an opportunity of calling in some one to instruct him if he gets into trouble. The new men are put into the light factories, and if they show that they are good men, do good work, and there

is an opening in one of the better or heavier factories, he is entitled to that opening, and a new boy is put into the light factory again. I don't like the idea of having to change, but the man that is a good man, if he is where the run of work is light, he can't stay there, and we cannot pay the wages that he is entitled to, consequently we have to make a change. Of course, if we could pay at that light running point $50 or $60 a month, we could keep that good man there, but the business does not justify paying that amount.

Now, there are a number of points that go to make up a good cheese maker. In the first place, he must be a maker of good cheese. Then he must be willing and able to dress his cheese and put them in the boxes in a good condition, to make a good appearance. That is not quite as important as to have a first class quality, but it is very important.

Again, we must have a man who is pleasant and agreeable with the patrons, and still who has the courage to say "Your milk is not in fit condition to receive this morning, and I will have to return it," and can say it in such a way that the patron will not go away and feel bad and offended. Then we must have a man who is neat in keeping the factory and surroundings in a nice condition. Those four are the important points. Then we want a man who is such a man in his life and habits that the patrons will have confidence in him. I could go on and enumerate eight or ten more points in the make-up of a good cheese maker. We can't often get them all in one man, but I generally figure this way, that I will set up the row of points, and knock them down, and if there are enough left to make a fair, average man, I am pretty well satisfied. Then I try to decide what that man is worth, and as fast as I can honestly do so, I will cheerfully recommend that man to another and larger factory. I will help him to get a better thing. In Kansas, we occupy our factories the year around, most of them, and, of course, in the winter time we run some of them very light; sometimes they run down to 12,000 or 14,000 in a month. In such a case as that, of course we lose money, and we say to the factorymen, "We will lose some money if you are willing to lose some of your time." We run it perhaps three days in a week and he receives $2.00 per thousand for every thousand pounds he makes up. Of course, we can't afford to do that very

long, but we do it for the sake of keeping things going. Then when the amount runs to between 15,000 and 20,000, the rate is $1.75. When it runs between 20,000 and 25,000, it is $1.65, and so on, decreasing as the amount runs up per thousand, but increases his salary for the full amount of milk that he handles, so that when it gets up to 190,000 pounds per month and over, the operator receives 55 cents per thousand for making up the cheese, and he provides his own help, and he can have as much or as little as he wants. He must do his work, he signs a contract to that effect, and I visit him often enough to see that he is doing it, and in that way the operator is interested in the success of the factory. Our factories are owned and operated by a company, of course, and we like to have the operator in the company with us and interested in the success of each and every one of those factories, and we try to interest him in the business to such an extent that he hesitates to open up a factory of his own. We like to have them feel they would rather stay with us than go somewhere else. I think that paying on the schedule is a nice thing for the operator, and also for the young man who works in the factory; it gives him a chance to work up and to use his own judgment about getting a helper. The man who is willing and does good work is entitled to good pay. I don't know how our schedule plan would work in Wisconsin, but they have adopted it in some of the Missouri factories, though they think we are paying pretty big wages, and perhaps we are, but we are getting mighty good work done, and it pays to pay good wages under those circumstances. We are working hard to try to learn how to make good cheese and I am trying to get every one of the cheese makers in our factories interested in the success of Kansas cheese.

Mr. Scott: How much do you say you pay a thousand for 180,000?

Mr. Van Leeuwen: For 190,000 pounds of milk, the rate is 55 cents a thousand, and he furnishes his own help.

Mr. Scott: How much help does it take down in that country?

Mr. Van Leeuwen: Just as much as he wants. You under-

stand, we do not run our factories on Sunday. That makes about 7,000 pounds of milk per day, and a good man will get along with one helper.

Mr. Scott: What do the patrons do with the milk on Sunday?

Mr. Van Leeuwen: That doesn't worry us, they are willing to keep it home, and, of course, we are glad of it.

Mr. Scott: Could you apply this rule to a place where the makers own the factories?

Mr. Van Leeuwen: No, they wouldn't want to pay themselves.

Mr. Aderhold: I have been very much interested in this discussion, but it hardly applies to our conditions here. Most of our cheese makers own the factories; they furnish the factory, machinery, supplies, and labor. The question with us is, what is a fair compensation for doing that work by the pound.

Mr. Van Leeuwen: We have been keeping this past season statistics as to the actual expense of manufacturing a pound of cheese, so that we can show the operators more fully that we would be glad to turn the business entirely over into their hands, and this next season we hope to have records so thorough that we can say to them, "We will pay you so much per pound for manufacturing cheese, and you to furnish all the supplies. We will furnish the factory and machinery and then turn the plant over." Then, if they can economize in operating expenses, they will have the benefit of it.

Mr. Scott: How does this company make its money. Do they pay the farmers so much a pound?

Mr. Van Leeuwen: We buy the milk outright, based on the butter fat value. At the present time we operate creameries and cheese factories as well, and at present we pay for cream at the skimming stations within two and a half cents of top prices for butter fat for the month. In the cheese factories, we pay a cent to a cent and a half above the butter value for the milk.

Mr. Scott: Most of us in this section own our factories, and we make our wages on the amount that we get, and through this country we make cheese for the farmer, the farmer pays so much a pound for making, a cent and a quarter, a cent and a third, or a cent and three-quarters, and furnish everything.

The Chairman: What do you think is a fair compensation?

Mr. Scott: All I can get. I was trying to find out whether we are getting as much in this country as over in Kansas.

Mr. Van Leeuwen: What is the price charged for making where the factory furnishes its own operator and makes it up and markets it?

Mr. Scott: I make up cheese and furnish everything. I get 1⅜ cents a pound for all cheese that brings 10 cents and over; and 1¼ for all cheese that brings under that.

A Member: You are making too cheap.

Mr. Aderhold: I think Mr. Scott loves his patrons more than his patrons love him, otherwise he would ask more and they would pay him more. The ruling prices are, generally speaking, 1¼ cents for flats or cheddars, or for 30-pound cheese, or larger ones, and a little bit more than that for smaller ones; that is for the main cheese sections in the eastern part of the state. For the north, in the newer country, they pay a quarter of a cent more; I think perhaps they are just about getting paid, most of them. They are not making as good a cheese as they ought to; the farmer is paying for a poor job, and he is getting it. The cheese makers ought to get together and face this question; you are not doing as good a job as you know how to do, and that is true of nine out of ten cheese makers in this room. Not one out of ten is doing as good a job or running his factory as well as he knows how to, or as he would do if the farmers would be willing to pay a little more for that kind of work. The cheese makers ought to have an understanding, and I believe the farmers would appreciate it and pay a little more for it; they can well afford to do it. Last spring I attended the annual meetings in some instances, and I persuaded the farmers to pay a quarter of a cent more on condition of improved service in the factory, better machinery, cleaner whey tanks, etc. The farmers have tried it and are very much delighted with the change. They don't count a quarter of a cent when they see they are having their whey tanks cleaned once a day and know they are having cleaner factories, and better machinery, which means a little more cheese and a little better cheese also.

That is the stand that the cheese makers ought to take. Of course, you can't get that change all at once, but a good deal has been done this past season towards it, a very great deal. The

cheese makers have been stirred up and the farmers have been stirred up to demand better factories, cleaner factories and whey tanks, and when they begin to want a thing pretty bad, they won't stop at paying a little for it. I think the fault lies mostly with the cheese makers. You have not asked what you are entitled to if you intend to do a good job. You are too much afraid of losing your patrons. You are awful good fellows in some ways, but as business men, you are "cheap skates." I can say that here, because we are in Milwaukee.

Mr. Scott: I am willing to get all I can. I am a cheese maker simply because I can make more money at it than I can working on a farm. I did that even when I took charge of a factory and got a cent and a quarter. Mr. Aderhold is right when he says that the factoryman can get more if he will fix up and build better machinery. I can tell you of one factory where the farmers did give the man an eighth of a cent more to fix up his factory, and if he wouldn't do it he wouldn't have enough milk to make up in a short time.

Adjourned till 9 o'clock next day.

THURSDAY, JANUARY 7TH, 1904—9 A. M.

Convention met pursuant to adjournment.
Acting-President Powell in the chair.

SOME THINGS OUTSIDE THE CHEESE FACTORY.

PROF. F. G. SHORT, FT. ATKINSON.

Theoretically, a cheese maker is supposed to be sufficiently busy with work inside the factory to leave him but little time to interest himself with outside affairs, but practically his interests outside are as great, if not greater, than that branch of his work relating directly to the making up of milk.

In actual work we have a condition where the patron is at one end of a see-saw, the consumer at the other and the cheese maker in the middle, trying to keep both ends even.

An average cheese maker can take good milk and make a good cheese, but it needs no prophet, nor the son of a prophet to foresee that dirty, tainted milk will make a poor cheese in spite of the efforts of the most successful among you.

A cheesemaker shut up in his factory with a vat of milk to make up, is like a young bear, with all his troubles before him; out of that vat of milk may come many things in the way of cheese, good, indifferent, poor or bad, according to the condition of his material, and the chances are that considerable of the output will be classed otherwise than good. The cheese maker's ability to change the quality of his milk is limited; he can neither pasteurize nor sterilize; the little he can do with a starter towards improving conditions does not have a marked influence on the quality of the milk, if it is poor in the beginning. So his skill is largely dependent on the personal habits of from 20 to 60 men who supply him with his raw material,

and it naturally follows that he must take an interest in things outside the factory whether he desires it or not.

A cheesemaker starts with a product that once was pure and without contamination. If it only had remained in that state, had come to him fresh from the cow without going through the handling from udder to pail, pail to can, can to weigh can and thence to cheese vat, what might he not do with it in the way of turning out a prize winning cheese? But between the ideal milk and the prize winning cheese stands an invisible army of more millions than can be counted—destroyers of the good quality of milk and the cheesemaker's peace. It is perhaps lucky that they are invisible or else along in the hot month of August we should have cheesemakers seeing things at night, for if we would watch them at work, the last state of that man would be worse than the first.

Now there has been much talk, experiment and advice concerning the methods to be used in making poor milk into good cheese. Doesn't this savor much of locking the door after the horse is stolen? We will take it for granted that every man at this meeting keeps his own sidewalk shoveled off, or in other words, does his utmost to keep his factory, its utensils and surroundings, including the whey tank, in a cleanly condition. For what shall it profit a man who contaminates his milk by having a dirty factory and tries to make good cheese in it? So we will assume that all his troubles come from outside, and coming from outside, what can he do to remedy the trouble?

Naturally, the first thing to consider is what the troubles are and their source. In a majority of cases, the cheesemaker's troubles, their origin and supply, all start from one source, the careless patron. He is the source from which a constant supply of dirt, bacteria and filth of all kinds flows in a constant stream into the receiving tank. But then, there are patrons and patrons and what, with the dirty one and the careless one, the good one is usually lost in the shuffle, and for our purpose is only useful as an example.

Of course, in hunting around for the source of trouble, the first thing we strike is bacteria, a word that seems to have been much overworked of late in the dairy business, but which explains so much and accounts for so much, that we must use it if we expect to get out of our troubles.

Call it bacteria or dirt, dirt or bacteria, as you will. Use the common or scientific name; it all means the same thing in the end and both are just as troublesome to the cheesemaker under either name. So, granted that we know what the trouble is, let us see where it comes from and if we can break the endless chain that leads from patron to cheesemaker and from cheesemaker to patron in one continuous round.

When cheese making is started in a new country, that is, one that is just being settled, it is the universal experience that an exceedingly fine quality of cheese is always made.

This means, of course, that the country has not been seeded with the various forms of bacteria that injure the quality of the cheese. Bacteria, like other plants, require the proper soil and the proper conditions for growth, and the new country has no barn yards containing dried manure, no roads supplying infected dust to every wind, no pig pens, nor any of the infected spots that man loves to surround himself with. What little material of this kind that is made, is soon destroyed by sun and air.

But when the settler comes, he brings with him many things that were best left behind. Weeds and rats always follow civilization, and also bacteria of all kinds and species. It takes time for them to be fully established, but once firmly settled, every hole and corner that affords food and shelter is swarming with them.

We know they are there, but how do they get into the milk? There are many different methods, but dirty cows, dirty milkers, dirty milk utensils and dusty air in stables, and the general dirt that is part and parcel of everything around us, are the usual sources.

To know that everything around us aids in contaminating the milk, is enough to make a man throw up his hands and quit, but as we grow crops only by keeping the weeds down, so we can produce good milk by knowing how to keep the bacteria down, and in this case especially, knowledge is power, if rightly used.

Let us begin at the beginning—the milk in the udder. For all practical work this milk is pure, with the exception of the small amount that is contained in the lower part of the teat, and whatever happens to it after it leaves the udder, in the way of contamination, is the result of its surroundings.

The milk coming from the udder in fine, thin streams necessarily exposes a large surface to the air and thereby takes up numbers of air germs, that is, those that are floating in the air of the stable. These find the best conditions for growth in the milk pail and thus start the milk on its downward path.

Along with the first streams of milk comes the bacteria that are held by the milk just inside the teat, and these add a second class that are in active growth and ready to enter at once on their anti-pure-milk work. Then the milk pail contributes its share, the milk can also, and by the time the milk gets to the cheesemaker, it has been thoroughly seeded to a crop of troubles that are full grown before he is ready to set the milk.

Of course all of this is nothing new. The cheese maker has had bacteria talked at him, written at him, and thrown at him in ponderous chunks until he is like a man with consumption; who is told all about the bacteria that causes it; how it looks and acts; how many of them he has got; where they come from and where they will go after they have got through with him; in fact he is full of knowledge regarding his particular bug, but it doesn't help him to get well.

So we will leave out all description to the particular breeds of bacteria that afflict cheesemakers; omit their pedigrees and families, and see what can be done in the way of producing milk without them.

Civilized man is a dirty animal; he is born amid dirty surroundings, lives in dirt, dies and goes back to dirt, and it is only because he comes of a tough breed that he does not die long before his allotted time, consequently it is no wonder that his productions are dirty, and milk is no exception of the rule.

There are a few cases in this country where this fact has been appreciated and the result is clean cows, stables, men and milk, and the price obtained for such clean milk is something astonishing.

This certified milk is at one extreme, the average cheese factory is at the other end and the question is, whether somewhere there is not a middle course of comparative cleanliness that is practical to the producer and beneficial to the cheese maker; one that will give him milk sufficiently clean to make good, well flavored cheese.

The primary condition for producing clean milk is the pos-

session of a clean stable. Now, as everyone knows, in the building of a stable the question of cleanliness is of secondary consideration. Cheapness comes first, convenience second and cleanliness, if thought of at all, is somewhere in the background. The result is rough walls, ceilings and floors, an ideal combination to catch and hold dust and accumulate spiders' webs, and where every air draft or touch of hand or clothes sets in motion a fine cloud of bacteria-containing dust.

The only remedy for this condition is a smooth-walled, tight-jointed stable, one that has no dust shelves on the sides, nor holes in the ceilings through which hay dust may fall. If such a stable can not be provided, much may be done toward improvement by an occasional sweeping of the stable while the cows are out for exercise, as well as a liberal use of the whitewash brush. Whitewash covers a multitude of sins in the way of dirt and is death to bacteria whenever found.

Ventilation goes a long way towards removing dust from the stable and an examination of the ventilating shaft, if the light is good, will show a constant stream of dust particles shooting into the outer air.

Hay dust is the home of more cheese troubles than any one thing around the stable, so feeding and milking should not be carried on at the same time. Old, musty or mouldy bedding straw should not be used just to save it; it is expensive in the long run as shown by the cheese.

A milk pail that has received a wipe and a lick and a milk can that is in the same condition, cannot be excused. Soap and hot water are cheap, washing soda cheaper still, and no dairyman's time is so precious that he cannot afford to provide clean milk utensils. All this is practical, common, every-day cleanliness,—such as any one has a right to ask of the place where human food is produced, and it is imposing no hardship on the patron when he is asked to improve his conditions to this extent.

The one great trouble with any system of cleanliness is the numerous unsuspected holes through which troublesome dirt will creep in. A man with the best intentions towards cleanliness may not succeed in reaching his desire. What is one man's idea of cleanliness may be dirt to another, but there are a few things towards which every patron of a cheese factory may

strive successfully,—more light and more fresh air in the stable,—these are cheap; better arrangements for bringing the feed and removing the manure; a little time each day spent in keeping the stable clean, and the cows also; a coat of whitewash each year to kill bacteria and lighten up the stable,—this also is cheap. If possible, a tight ceiling overhead to keep hay and other dust from falling in a fine shower over everything in the stable, including the milk pail.

None of these things are expensive, but they go far towards making better milk, and what is also important, towards more healthy animals in the herd.

Then there are things which require no outlay of money, but merely personal care and personal cleanliness. Any patron who allows his cows to remain dirty, covered with a thick coating of manure, is a personal enemy of the cheesemaker. No man can do clean work with dirty tools, and if the cows are covered with manure, the milk will contain it in some degree.

Again, the cows in summer have a decided liking for mud, both for cooling purposes and to keep the flies away. Slough mud on the udder is easily transferred to the milk pail, from whence it is transferred to the cheese.

An udder that is covered with slough mud should be washed; a cow that is covered with a coating of manure should be cleaned; there can be no ifs or buts about those two statements, for otherwise the cheesemaker receives poor milk.

Then there is another point: If the milk is fairly good, it will go off unless it is cooled. Warm milk is the ideal home for bacteria; there they live and multiply, but cool it and the trouble stops completely or is very much lessened. Therefore the patron should be encouraged in every possible way to supply cooled milk to the cheesemaker.

If the cheesemaker could destroy all the rusty, old, dented cans that come to the factory his trouble would lessen proportionately. An old can is the source of much evil. They are hard to handle, which is important; they are impossible to clean, which is more important, and they are generally a nuisance, therefore, an old can has no place in handling milk.

Supposing we make a list of those things that a patron can do without incurring prohibitory expense.

He may be asked to do the following things, and the cheese

maker by gentle insistence can persuade many of his patrons to adopt them, to their and his own benefit, especially his own.

He can ask the patron, especially when building a new barn, to see that the cow stable is smoothly sheathed inside to prevent the accumulation of dust and the sifting of hay dust from overhead.

To whitewash the stable once a year at least; to clean it several times a year by removing all trash and dirt, brush down the cobwebs and accumulated dust.

To keep the cows clean, not allow them to wade through sloughs of black mud or liquid manure, to give them clean drinking water, and not allow the barnyard to become a mud hole. Also to provide clean bedding, and stop that exceedingly filthy habit of wetting the teats with a little milk before milking.

To wash all cans by first using luke warm water, after washing with warm water and washing soda, and finally rinsing with boiling water and standing them in the full sunlight, which is an excellent sterilizer.

To use milk pails and cans for no other purpose than handling milk, and especially not to take back the whey in the can the milk is brought in. To empty and clean the cans as soon as they get home and not leave them standing in the sun to do other things that seem more important.

There are very few things around the farm that should come before a clean milk can. If the can is allowed to stand with sour milk or whey, it becomes so infected that the usual washing has but little effect, owing to the thin film of casein that forms on the tin can and affords a constant daily supply of bacteria.

To burn the cloth that has been used to wash the cans and not buy a new one.

Although the above list is somewhat long, there is nothing in it that is either expensive or asking too much of the patron, but they are things that mean much to the cheese maker who handles the milk.

The man who tries to get through a crowd by rushing usu ally finds himself stopped by the slight obstruction offered by each individual, but if he goes slowly, finding a passage-way here and a hole there, he can usually get through. So if a cheesemaker should suddenly propose to his patrons such rad-

ical changes towards cleanliness on the above line, he would probably find them united in offering resistance towards any suggested changes, but like the man and the crowd, he can obtain his end by indirect means.

Steady, gentle push will go far in cases where a club would be useless.

You will probably ask about now: Where does the cheese maker come in and why should he look after the dairy habits of his patrons? Well, a stream can never rise higher than its source, nor a cheesemaker's product be better than the quality of the milk brought to him. Imperfect milk means imperfect cheese; tainted or gassy milk always makes tainted or gassy cheese, and although by your skill in making, you may be able to remedy some of the faults, by the time the cheese comes to the consumer, the faults are the most prominent thing about the cheese, and a consumer remembers one poor cheese and forgets ten good ones.

The cheesemaker wants good milk because it lessons his labor, keeps up his reputation as a maker and in every way that can be enumerated it is to his advantage. Let him, therefore, put some of his energy into a pure milk supply outside and he will not need so much energy in remedying troubles inside.

Although the patron is not a sinner above all who dwell near a cheese factory, he is the only one who interests us at present. The cheesemaker has his faults, but they are inside the factory. Others may do missionary work in that country, but for myself, I will remain where I started—outside.

DISCUSSION.

Mr. McKinnon: This paper was so well written and the points so well taken in every respect that there is not much opening for questions. If a paper like that will not reach our patrons I do not see how they can be reached. If they could have spread out before them the cool facts as they are contained in that paper, no progressive farmer can read it and fail to see its importance.

A Member: Professor Short, do you find that in the older

dairy districts there is more to contend with in cheese making in the way of undesirable bacteria?

Professor Short: I do not think there is much doubt about that. In the older dairy districts in this state and in Minnesota and down in New York state they have found that to be true, and it is a fight all the time to keep the quality of cheese from running down.

Mr. Singleton: In western Ontario, in the older cheese districts, the same is true. Every year there are new germs that we have never known of before, appearing.

Mr. Van Leeuwen: We examined nearly a carload of New York cheese in Kansas two years ago, and there was something about them that I could not understand. I have never run across it in our part of the country, and I could not determine the cause of it. The cheese were fine, white New York cheddars, and they developed a very bitter flavor, and where they were packed two in a box between the two cheeses, the tops got slippery and you could just put your hand on top of the cheese, and push the top of it off, paraffine and all. I thought perhaps it was due to the paraffine, but I couldn't, of course, lay that bitter flavor to that. The entire car of cheese was in that condition, but, on the other hand, the cheese were made in one system of factories. Three or four months after that I was in Kansas City, and one of the large wholesale houses there, cheese buyers, asked me to go into the cellar and take a look at some cheese there. The minute I got in there, I said, "You have got the same thing here that we had three or four months ago in an entire carload of cheese," and on examination I found that it came from the same district in New York. Now, if there is any one here who knows anything about that, I would like an explanation. I think it was caused by something outside of the factory not under the control of the cheesemaker. Of course, we are new out in our country and we have lots of wind and sunshine, but we never struck anything like that.

Professor Barr: We have what we call "bitter" milk over in our neighborhood that will give just such conditions as the gentleman speaks of. It is worse in the winter and we think it is increasing. At first, it was just in warm weather, but now we have it the whole year. Professor Harrison has discovered a

germ growing on trees and he suggests that that is where it comes from.

Professor Short: I have noticed a bitterness in some cold cured cold storage cheese.

Professor Barr: The cold storage does not improve this flavor at all. It is in the cheese, and if any of you have it, you will readily know it. You can't get the curd cooked; it will make a soft, mushy curd. The acid will develop very, very fast, and you can't get it cooked. The result is it makes a weak-bodied cheese, and, of course, the flavor will develop very fast in that kind of cheese. Our remedy has been, where we know we are going to have that kind of milk, we set it as sweet as we can get it, and cut it fine, and get it well cooked. That is the only remedy I know of to expel the moisture. If you can expel the moisture by cooking it, then there would not be so much trouble in making a nice cheese. I can only say I hope that you may never have this flavor in Wisconsin. We find it the hardest thing we have been up against in Canada.

Mr. Marty: I found last summer in my travels, milk that rqeuired two hours and ten minutes to coagulate, while the milk of other patrons would come along in six minutes, and when the milk would become mixed in the kettle, it seemed as though the rennet did not have any effect, that the casein would not precipitate. I think it was very near the same condition as the gentlemen have just spoken of, and I found it nearly all through the first part of the season. If it was not handled very slowly, you could not get it cooked. The cheese makers in the Swiss cheese industry were troubed with it nearly all summer.

Mr. Van Leeuwen: To go back to that bitter cheese flavor, I thought that those cheese, when we first got them, did not show that flavor so pronouncedly, at least. Of course, I don't know whether there was any cold storage entered into that question at all. We did not keep part in cold storage and part in a warm room to see what the effect would be, but we know that it did develop very rapidly in cold storage, and was very pronounced. I wonder if there have been any experiments made as to the effect of cold storage in such cheese.

Professor Barr: The only place we have cold storage to any extent is in our government cold storage plants. The tempera-

ture is about 37 or 38, and as far as we have been able to learn, there is no difference in the development of this flavor.

THE CHEESE MAKER AND THE PATRON.

C. H. EVERETT, RACINE, WIS.

I believe in you and your organization, else I would not be a member of your association, and would not be here to address you. I believe in Wisconsin and Wisconsin farmers, of whom no state in the Union can boast of better, more intelligent, or progressive citizens. I know of the superior conditions that exist in our state for the manufacture of fine cheese and other dairy products, and I am also conversant with some of the reasons why Wisconsin cheese has not always, and is not now, as good as it might be, or as good as it should be. I am not a cheesemaker and know but little about the manipulation of milk in the factory for the production of good cheese, but I have been a milk producer for a good many years and from a knowledge of the dairy business gleaned from the hard school of experience I came to the conclusion years ago that Wisconsin dairymen were not making the most of the splendid opportunities at their command, and so, as my good friend Governor Hoard says, "I began to preach the Gospel according to the cow," and am still at it.

No state has more favored conditions of climate, water, and feed, for the manufacture of high class cheese than Wisconsin. No state has so good a dairy school wherein to teach young men the science of cheese making, no state has such a strong and useful Dairymen's Association, or one that does more to lift dairymen out of unprofitable methods into the brighter light of intelligent dairying. No state dairymen's association does so much or spends so much money to help the milk producer and the cheesemaker, as does ours. There is not a more active, vigorous dairy commission in existence, than the present one in this state. It is striving to the limit of human ability to cor-

rectly interpret and execute the laws, to protect humanity from fraud and to punish violators of the statutes. The recent appointment of one of your number to a position on the commission must be gratifying to you as it is to me. The people of the state, and the dairy interests especially, should congratulate Commissioner Emery upon the wisdom shown in making the selection. It is a dairy commission of dairymen and factorymen and adequately equipped so far as quality is concerned for the strenuous work that lies before it. The farmers' institutes, dairy and agricultural papers, our experiment station, cheese makers and butter makers' conventions, dairy boards of trade, etc., are of the very best, and all are striving to the utmost to improve the quality of Wisconsin cheese, and all other products of the farm and factory, trying to make Wisconsin farmers more prosperous, trying to induce them to study more diligently that they may more clearly see how to help themselves.

With all of the above splendid equipment what is the matter? Why is there poor cheese? Frequently some one asks me where good cheese can be obtained, and recently a gentleman remarked that he hoped that I would tell the cheesemakers how to make good cheese, for he could not get any and did not believe any was made in Wisconsin. He further said, "If there is any good cheese on exhibition at the convention buy one for me." Wisconsin cheese is no doubt as good as any, ranks equally with New York and Canadian cheese, but it is not all good and the best not good enough. There are many fine cheese makers in this state, but some are less skilled than others and are not as efficient as conditions demand. There are many milk producers who know what good milk is, and who produce and deliver it to cheese factories. There are by far too many others who are careless of their own interests and that of the community and state when they send bad milk to the factory. Fine cheese is the result of good milk, manipulated by a skillful cheesemaker in a factory properly equipped to manufacture and cure the product. Deficiency in any one of the above, or in them all combined will militate against quality and accordingly lessen the profit of all interested. We are progressing, great improvement has been made in quality and quantity of Wisconsin cheese, and during the past few years you all remember the filled and skim milk cheese epoch and the resultant de-

generacy of the whole cheese industry in this state. That experience cost Wisconsin dairymen thousands of dollars and years of valuable time, but we have partially re-gained the lost ground and lost reputation abroad, as well as at home, and are again under full sail toward conditions that promise favorably. Let us hope that they will be permanent and that the laws, state and national, governing the manufacture and traffic in cheese will evermore keep us from dishonest, degrading and unpatriotic practices.

Whatever good results may have been achieved in the past few years, will not now stand as an excuse for any lack of enterprise or push on your part, but more than ever before must you exercise skill, intelligence and perseverance in the pursuit of your calling. Not only must you become more proficient in the science of cheese making but you must be leaders of men, broad, truthful, forceful and convincing, for upon you, more perhaps than upon any other single force, devolves the duty of leading the patron from wrong to right methods. You must become better versed in the problems that confront your patrons, in the feed and care of the cow and her product, in stable construction and ventilation and in the thousand and one other things that go to make good milk and profitable dairying. You must labor with patrons and factorymen for larger, better equipped factories. You must be courageous and stand firmly on your dignity and honor against the pound for ten system or any other system that you know to be wrong and hostile to the best interests of patrons and the community. You occupy a very big field and fill a very important position. You must reason with and educate men, make them see the importance and necessity of good cows, good feed and water, bright, clean cans and good, wholesome milk.

This association should stand as a unit against the acceptance of filthy milk and against any kind of trickery or questionable methods on the part of patrons or factorymen. There are many things connected with cheese making that are a curse to the industry. True it is that they are hard to overcome, but by standing firmly together as men of principle you will lend a powerful influence towards a brighter and better condition of things and eventually a more adequate compensation for your services.

Every cheesemaker should be a graduate of the Wisconsin dairy school. I am not ready to say that this should be made compulsory and that no cheesemaker should be allowed to operate a factory without a certificate from the school, as it might work hardship at the present time. But I know that the dairy school graduate is much better qualified for the important work he has to do. He is broader, he learns many things at school other than cheese making that are helpful to him. He has got the science, he knows and does not guess, he becomes an authority in his community and his influence is strong.

Life is what we make it, each one is responsible for his own success or failure in business, or as a cheesemaker. True, we gather much valuable information and are very helpful to each other by counciling together frequently, but each one must stand out clearly upon his own individuality; to be successful he must be a student, diligent, painstaking, methodical and persevering, and above all else, he must be a man, honest with himself and with the world. He will do pretty nearly right when he does by others as he would that others should do unto him.

I am anxious to see the cheese industry of Wisconsin grow, assume broad proportions and command the respect and attention of the cheese consuming world. I want to see Wisconsin farmers and dairymen more prosperous and Wisconsin cheese makers second to those of no other state or country in intelligence, skill and character. Your duties and requirements are manifold, but I trust you to meet and execute them with the promptness and courage characteristic of men with a purpose in life.

DISCUSSION.

Mr. Dewhirst: To whom do you ascribe the enormous quantity of poor cheese that we have in Wisconsin?

Mr. Everett: Oh, it is the fault of the patron, unquestionably. There is no cheesemaker, no matter how skilled he may be, who can make good cheese from poor milk. But I intended

in my paper to urge upon the cheese maker the importance of educating the patron. That duty devolves very largely upon the cheesemaker. He must be bright and intelligent, capable of getting hold of the patron as much as possible, leading him into better methods. I know very well how hard the milk producer is to contend with, to educate, to tell anything to, but there are many forces at work upon the patron for better milk, and among all of them none is greater than the cheesemaker, or has more influence.

A Member: Perhaps this gentleman can tell us how he advocates his patrons caring for the milk from the time it comes from the cow till it reaches the factory.

Mr. Everett: I think, Mr. President, there are those in this audience more competent to answer the question than myself, although I have been a dairyman a good many years,—not a cheese factory dairyman, but a butter producer. I think that milk, to make good cheese, should be cared for about the same as that for the manufacture of butter. In the first place, to produce good milk requires healthy cows good stable sanitation and condition, healthy, wholesome pure food, and above all else for cheese, good water. After the milk is drawn in a cleanly manner it requires, of course, good care or it is easily ruined. Pure milk drawn from a cow will not remain pure a great while in a filthy stable, or under any kind of conditions wherein it is liable to the influences of bacteria. I believe in the aeration of milk, and I believe cheesemakers in general are advocating milk aeration of some kind immediately after the milk is drawn. Just how much the milk should be cooled down before it is delivered to the cheese factory, I don't know, but for butter purposes it should be cooled quickly and effectually. The object in cooling milk is to retard the multiplication of bacteria. I believe the subject of clean cans, etc., has been discussed here already.

Mr. Dewhirst: In connection with what the cheesemaker can do in regard to instructing his patrons, I know that some of the dairy students, who are making cheese, are putting what they learn at Madison into the form of circulars; they have them typewritten, putting the matter into simple language, and they send this out among their patrons. Then there is a circular issued by the Agricultural Department at Washington, which

you can get free, and is called "Fifty Dairy Rules." They are printed on a card, which can be tacked up in the stable where the patron can see it every day. I think you can get a reasonable supply of these from Washington by simply writing to the Secretary of Agriculture and asking for them.

A Member: I do not quite agree with Mr. Everett in regard to aerating milk. I have never received better milk than I did when I ordered my patrons not to aerate the milk, but to cool it and keep it covered up.

Mr. Mason: I think that aeration is a good thing, providing you go further and tell your patrons where to and where not to aerate their milk. I think that the aeration of milk, under proper conditions, will remove the heat of the milk quicker than in any other way, but it must not be aerated in the barnyard or near the pigstye or anywhere, except where good, pure, wholesome air will help the process.

Mr. Alvis: In the summer time, when we have real close air, I don't know that we can find any place in the neighborhood of our buildings where the air is pure enough to aerate our milk in.

Mr. Wallace: I want to ask Mr. Mason if his patrons do not have trouble keeping the cream down where they do not aerate?

Mr. Mason: I advocate cooling the milk as soon as it is drawn from the cow, and I never heard of any trouble about the cream not dissolving. I believe that the milk as it comes from the cow is just as it should be for making cheese, unless the cow is diseased, so I don't see what you want to aerate out of it. If you cool it off, you get the heat out, and then cover it up right away.

The Chairman: Can you make a first class cheddar cheese from milk direct from the cow?

Mr. Mason: I don't see why you can't.

The Chairman: Have you ever tried it?

Mr. Mason: That is what I am asking, what do you want to aerate out, what is in that milk that you want to get out?

Mr. Clark: When your milk is drawn, say, you get 100 pounds of milk and put it into a can, and that can is set into a tub of water, then you instruct your patrons to stir that until it is cooled down. It is merely the heat that you want to exclude from the milk. Now, does the water draw the heat out

through the can from the center, or does the heat come from the center to the sides of the can into the water and then out, or does the water send the heat to the side of the can and then out? Anyway, what are you doing but exposing the contents of that can to the air at the time?

Mr. Mason: The air surrounding the buildings on the farm is not fit to aerate milk in. I don't mean to say if the milk is perfectly pure that it is damaged by it, but I say that the conditions on the farm are not such that you can advise your patrons to aerate the milk. Therefore, I always advocate keeping the milk from the air around the buildings. I believe it makes better flavored cheese by not aerating the milk.

Mr. Dewhirst: I do not believe but that outside of the immediate vicinity of the manure piles, the air upon the farms is pure. Milk comes from the cow practically sterile, if the cow's udder is clean, but it is contaminated by noxious gases and odors which are taken into the milk in the barn. If this milk is taken outside the barn anywhere, where the wind does not blow from the manure piles, I think there is no question but that the air going through the milk will expel the odors that come into the milk in the barn, and thus increase the keeping qualities of the milk, and so there would be less acidity when it reached the cheesemaker and he would have better control over it.

Mr. McKinnon: Would you hold to that old idea that the milk should be taken direct from the cow and separated as soon as it could be, or would you advise aerating that milk even for butter? I am doubtful about its being a good plan to aerate even for butter. Last year one of our Canadian friends said on this question of pure air that they had tried it in the barnyard, and then they tried it in places remote from the barnyard; they got off twenty-five or thirty rods from the barn, and they aerated the milk, and the result of the aeration was that it deteriorated it, according to his way of thinking. With us who have taken care of milk on our plan for the last three or four years, there is no question in our minds but what that is the way to take care of it; that is, to cool it just as soon as you can after it is drawn from the cow, and we cool it for the purpose of stopping the work of the bacteria, and we hold to the idea that it is perfectly useless to aerate that milk and mix in more

bacteria. We have been told today by a number of speakers that bacteria are floating in our barns and in the air all around it by the million. Now, should we pour our milk through any kind of an aerator and take up into it thousands more additional germs? If we set it into water and cool it as soon as we can, the bacteria will not work. However, I would emphasize this idea still more, that it is the cooling of the milk that stops the action of the bacteria, and when the milk goes to the factory, if the growth of the bacteria has been retarded, the cheese maker has absolute control over that milk, which he cannot have if the milk has been aerated and not been properly cooled, because the bacteria have got so far started in the milk that when he commences to work in the vat the next morning the bacteria develop altogether too fast for his uses.

Mr. Dewhirst: The gentleman seems to assume that when we aerate we do not need to cool. I had no idea that aeration would take the place of cooling, but that aeration combined with cooling will certainly help the keeping qualities of the milk and enable it to come to the cheese factory in better condition. In regard to the gentleman's question as to separating, he must remember that the centrifugal separator is a process of aeration in itself. It is subjected to the centrifugal force, and if you will put your hand to the spout of the separator, you will find a very perceptible air coming out,—a strong wind,—so that the centrifugal separating of milk is an aerating as well as a separating process.

Mr. Everett: There is a vast difference in the kind of aerator that you use and the difficulty, no doubt, is to induce a patron to use an aerator that is a good one. The one which I use not only aerates, but it cools at the same time, so that the milk gets the aeration, it runs over a nice cold surface, and leaves the aerator close to 50 degrees, and is then submerged in ice water. That kind of aeration in my judgment is good.

Mr. Mason: That milk would naturally have to be near the well, and the well near the barn, and I don't care what anybody says, I believe that the farmer who aerates milk around the barnyard will do it more harm than good. You must remember we have from thirty to thirty-five patrons hauling milk to the factory. You might get one who would properly carry out the principles advocated here, but you must take into considera-

tion that people are busy in the summer and they are not going to spend a whole lot of time doing something they believe is nonsense. For that reason, we must take a method that is quick and practical.

Mr. Aderhold: In regard to food flavors in milk, will aeration help that kind of flavor or not?

Mr. Alvis: Aeration will not help any food flavor, or anything of that kind.

Mr. Aderhold: I mean the food that the cows eat, not bacteria.

Mr. Mason: Don't cows eat bacteria?

Mr. Aderhold: Did you ever see them eat one?

Mr. Mason: Well, my friend Aderhold has the best of me. For the last two years, and especially this last year, I have instructed my patrons not to aerate, but to cool instantly after the milk is drawn, and I have had first rate milk. Our patrons have work enough anyway, and we have to get the best milk we can with the least work, and I find that this idea of cooling quickly is about the best way we can get our milk.

Mr. Aderhold: How low do they cool it?

Mr. Mason: I never put a thermometer into anybody's milk, but it seems to me it is about 75.

Mr. Aderhold: I think 75 would be pretty high. Do they mix it any?

Mr. Mason: Yes, they mix it.

Mr. Aderhold: Would it do to cool it without mixing, without any stirring?

Mr. Mason: I prefer to have it stirred a little, because there is danger of the cream rising.

Mr. Dewhirst: And the more you stir it, the better it is for the milk—it is simply more aeration.

Mr. Mason: It isn't so much aeration as when you are running it through an aerator, then the milk is all exposed to the air.

A Member: I have a farmer that brings about two hundred gallons of milk. He puts the can in a big tank of water and puts the cover on as soon as he pours in a pail of milk, and he never opens that can again, he just shakes the can so as to mix up his milk, and that is the best milk we have.

The Chairman: Try it for yourselves, each of you.

Mr. Clark: I am a farmer, and I don't like to hear anybody say the farmers have not time enough, but must neglect their cows. There is where they should put most of their time. When I hear cheesemakers say that the farmer hasn't time to attend to his cows, I want that cheesemaker to stop right then and there to convince that farmer that that is where he wants to put his work.

ADDRESS.

E. J. PIGGOTT, CHICAGO, ILL.

Mr. President and Members of the Cheese Makers' Association:

Your honorable, able and energetic Secretary, Mr. U. S. Baer, has invited me on several occasions to address your meeting and I refused him, and to refuse him further would be unfair and lack the proper encouragement in furtherance of so good a cause for which your association stands.

I speak from a buyer's standpoint and individually. As intelligent discussions of subjects for which this convention is drawn together by experienced and instructive members, not only as applied to affairs of cheese making, as well as matters pertaining to commercial affairs that must produce good and permanent results; one to grope alone in darkness, as was the case before this association existed, without improving methods, will certainly bring despair and loss to its best friends and bring unsatisfactory results.

Therefore, you are to be congratulated on having so good a set of officers and so good an association, and you must support it loyally, support and encourage its officers to the fullest, and your reward will bring a broad and comprehensive sense of duties and action in your own business affairs. You must move forward and upward; to stand still means to retrograde.

The subjects as set forth in your program invite discussion technically, experimentally and practically.

From a technical standpoint you decide how to perform and

produce best results and detect the fine and tractive features, hence the technique.

From an experimental standpoint, to reach the best results, and from a practical standpoint, how to apply your technical and experimental knowledge.

All your discussions should receive earnest and closest attention, so that when you return to your homes you are better men in your profession, hence satisfied with your vocations in life, and by your presence here have helped others as well as yourself to a higher and more elevated plane, for by personal contact with others, we all improve and grow broader, and what we gather from these meetings must of a necessity be a permanent and lasting benefit. So let me urge you to continue in this line if it takes your life's study and persistency, and continue this line to a successful end.

This brings to my mind the memorable words of that silent soldier who knew no country except our country, who helped to make it possible to know no East nor West, North or South in the trenches before Petersburg in the Virginia campaign of the Civil War. He served notice on the enemies of his country he would fight it out on this line if it took him all summer. Therefore, you must follow this great leader in the line of duty and action and accomplish results for which this convention convenes.

I will not discuss subjects kindred to those in your program, but would have you consider the relationship of the different elements that go to make up the cheese business in its entirety.

As I view it there are three, viz.: The farmer who brings the raw material, his milk, to the factory; the factory man who turns the raw material into the finished product; the cheese buyer who handles, buys and distributes the finished products, the cheese.

Of these I represent the third and last, although to some extent a manufacturer.

The first, the farmer, seems to have been well cared and provided for by providential causes and protected under the sheltering wing of sunshine and rain, of which Wisconsin always gets her quota.

The second, the middle man, is cared for by your association,

and is surrounded and protected by all the instruments of education, association and instruction.

The third, the distributor and buyer of this finished product, seems to have received scarce and scant consideration at your hands, except as you call upon him for contributions to help further the interests of the other two, and he is to my mind the most important of all. He has made it possible for the cheese factoryman and the dairy interests of the great state of Wisconsin to flourish as a garden in the spring time.

It was the good fortune of the speaker to visit this state in the early days of cheese making, when the larger portion of the product went into the hands of the commission merchant. Since then the buyer has encouraged the establishment of the Board of Trade and of dairy schools, has taken the product of the factoryman in and out of season. From a financial standpoint he has bought the product, carried it for months before it reached the hands of the consumer, invested his own money in it, and all he could possibly borrow at his banks. As I look back to these early days and see the rough fields of stumps and timberlands turned into farms year by year, new barns, new fences and new houses, I feel the cheese buyer deserves the good credit and mention by the association, and yet as far as I know he has never been invited as a body to partake in the discussions or to receive the benefits and advice that grow out of the wisdom of these gatherings.

He is certainly entitled to some consideration and also entitled to appeal to you to remedy some of the annoying and distressing grievances that have crept into business. This must be brought about in order that the combined cheese industry may flourish like a large structure, rearing its head in grandeur and strength; all its parts must be maintained and strengthened so that the weakening of one will not destroy the strength of the whole.

What are these grievances that are certainly amenable to treatment and remedy?

Let us consider them. First, we have too many cheese boards, which are extremely expensive for the buyers to attend. Then again we have the grievous and unfair way of settling with the factoryman for the payment of his cheese when they are not up to grade, and often the lack of time to intelligently go through

and inspect his cheese. This should be done in order to meet the demand of the factoryman and the right to buy his cheese at a subsequent period. Have we no rights that others are bound to respect?

It strikes me the wisdom of this convention is to advocate fewer cheese boards and more concentrated, at points where it is possible to have two competing railroads, thereby enjoying shipping facilities under such conditions as you cannot get where a board or shipping point is located on one road.

By concentrating a large volume of cheese at a given point, it would be thoroughly practical to have an inspector and weigher at a fair compensation to settle disputes between the buyer and factoryman, and some system whereby the credit of the buyer could be established, and then giving him, if entitled to credit at all, an opportunity to handle his goods in an intelligent and satisfactory manner, as the buyer largely sells his purchases on time.

Selling moisture and evaporation for cheese, making a constant loss to the buyer, factorymen going on board, testing cheese and having same bid on, then withdrawing cheese and turning same over to some buyer who had already contracted. Every box of cheese offered on board should be sold there; no withdrawals.

Weights.—Sending cheese in without allowing for shrinkage causes trouble between salesmen and buyer and does not reflect credit on shipper.

Factorymen that hunt for wholesale trade should not be handled carefully by jobbers. They depend on the trade for outlet and any factoryman that goes into business of selling direct should not be allowed on board with surplus stocks, and buyers should not take their cheese.

Sending in cheese that are "off" but not advising of condition of same when offered on the board sometimes makes buyer pay a premium for good cheese, as off cheese are a source of trouble to buyer, as no matter what settlement is made the trouble of handling never realizes enough to cover expense.

It was Charles O'Conner, the great statesman, who said that there was nothing right politically that was morally wrong. You will permit me to paraphrase this and apply it to the cheese business,—that there is nothing right in the cheese business

that is morally wrong, and, gentlemen of the convention, there are lots of things that have crept into the business that are not only morally wrong, but from a business standpoint, organically wrong.

By gathering in convention the Cheese Dealers' Association, by a resolution of this body, can reach a solution of these questions and invite the buyers' association to join them.

Some of you may say there is no necessity for this. If your cheese buyers do not buy the cheese, others would. I answer, yes, but experience will show at a loss to yourself.

That is a narrow and selfish view and will not stand the light and scrutiny of argument before the men in the business today, or the pioneer who made it possible for you to market the cheese and bring your business into the conditions they are today.

What and who made it possible to relieve you approximately of 180,000 cheese now in the warehouses, in equivalent of twins 60 pounds?

It is constructive work of the buyer made it possible for you factorymen, to be here to discuss matters for the advancement and relieve you of the responsibility of caring for cheese in your factories now as in years gone by and to provide money to carry these goods.

What do I mean by constructive work? Caring for them and all the attending expenses and the marketing of your cheese in various ways.

Now, in closing, Mr. Chairman, I want to thank you for inviting me here; I want to thank you for giving me a chance to free my mind, perhaps I will feel better—I don't know how you will feel. May the all-pervading white sheet that covers the ground of the state of Wisconsin, may its fertilizing conditions bring forth in the springtime delight, may it bring forth an abundant crop of grass, a generous flow of milk and may we all at the end of another given period partake of the bounties of a wholesome, generous trade, and when we meet again we will congratulate ourselves that we have exceeded for the twelve months that of the twelve months gone.

DISCUSSION.

A Member: Would you prefer the contracting system or the board of trade?

Mr. Piggott: I would prefer decidedly that every box of cheese manufactured be put on the board of trade.

A Member: And how near would you advise having the boards of trade?

Mr. Piggott: In the Muscoda district, they should have, as they have, one board; they gather in the product of an immense district. When the buyers go there, presuming that no cheese are contracted, there is enough cheese offered to go around, but it is this system of contracting that makes offering low. You take Fond du Lac, Plymouth, Sheboygan Falls, Sheboygan—too many boards. Fond du Lac ought to be abolished—not enough cheese there. Sheboygan and Sheboygan Falls might be consolidated. Plymouth is a good big, liberal board. Manitowoc might be served at Sheboygan. Hortonville and Appleton are within twelve or fourteen miles of each other, and one would be sufficient. At Hortonville you are at the beck and call of one corporation, because there is only one railroad goes there.

A Member: With only one board at Plymouth, there would be some buyers that would have to go thirty or forty miles, and that is pretty hard work.

Mr. Piggott: All of that has to be considered, the railroad schedules and everything else, but you show a cheese buyer a big block of cheese and he will get there, railroad or no railroad.

Mr. Wallace: Don't you think it would be advisable to have the cheese there at the same building and you bid on the board for that cheese and go right over and inspect it, and see what you are buying?

Mr. Piggott: That is a grand idea and as it should be, but that is a little too far advanced at present. Then you could settle your disputes right on the spot.

Mr. Wallace: Suppose I have a carload of cheese and I can get a buyer to come right to my factory and inspect it and pay for it, why shouldn't I?

Mr. Piggott: That is your business, if you want to leave

the board of trade out. But after you sell to that same fellow once or twice, you get that price always, you shut out competition.

Mr. Wallace: I didn't mean to leave the price of the board of trade out. We could decide on the price of some board of trade and you pay me that market price, less the freight and your expense there. How would that do?

Mr. Piggott: My expense there. That is the trouble now. It is my expense all the time. Let me tell you, my friend, you want to get away off in the corner with your product and bargain with these cheese buyers and they will pay well when they get started; you want to enjoy the benefit of the quotations of the board of trade, and you don't want to contribute to any of the expenses. You are selfish. You ought to contribute your little mite towards the nearest board of trade. Write down, two or three days in advance, how many cheese you have got, send to the Secretary of the board, and you will get fair treatment.

Mr. Wallace: How can we be sure of getting our money? His expenses will have to come out of it.

Mr. Piggott: The expense always has to come out of him anyway.

Mr. Wallace: He takes it out of the cheese all right. I am sure he wouldn't pay it out of his own pocket.

Mr. Piggott: It comes out of the fund which is hoped to be realized out of the profit he may get out of your cheese. Oftentimes he doesn't get it. You attend some board of trade. If you are not a member, contribute your mite toward the support of it.

A Member: Out where I am making cheese, they don't care to let the cheese go away without the money or without some security, and we have practically one carload a week in the place from the several factories.

Mr. Piggott: If you have a combination of factories, there must be intelligent men in your community who can go to your nearest merchant and find out whether Mr. Barber or Mr. Kirkpatrick or my people are responsible. You don't have to sell any of us your product without finding out. We are in the days of telephones and railroads, and the days are coming when you will have a trolley car alongside of your factory, and it

won't take long to get on that car and go to your nearest town and find out whether Tom, Dick or Harry is responsible.

A Member: What we are looking for is somebody that will pay the cash for that cheese.

Mr. Piggott: It isn't always convenient for the buyer to have the cash. He may have to bring that money by express to your place; he can't always bring it in his pocket to your factory:

The Member: We don't ask to have it paid at the factory, but in town.

Mr. Piggott: That is all right; you can go to your bankers in town and find out all these things. I find a cheese factory-man occasionally who is not honest.

The Member: No, we cheese makers are not always honest, nor do I think the cheese buyers are always honest.

Mr. Piggott: I know they are not.

The Member: But I would like to get some buyer that would be honest with me that would inspect my cheese and pay what they are worth.

Mr. Piggott: My dear sir, I would refer you to your nearest cheese board.

THE PARAFFINING OF CHEESE.

PROF. H. J. NOYES, MUSCODA, WIS.

The subject of paraffining cheese has been rather speculative up to nearly the present time. Many of the leading cheese dealers at first did not believe in it, thinking it would close up all pores of the cheese, making them air tight, stopping evaporation and curing of the cheese, that it would retain rather too much moisture, and all the bad flavors in the cheese. After it was tried by some of the dealers they said paraffine all kinds of American cheese, and some practiced paraffining as soon as cheese were from one to four days old. Others said not to par-

affine cheese containing too much moisture, or off flavor stock, or cheese that was sour, or high acid.

In my opinion all cheese should be cured some at least before they are paraffined. Cheese that contain an excess of moisture should be well cured, and if one has high acid or sour cheese, and has to keep them any length of time, they should be paraffined, which would keep them from moulding. There would be less work to care for them, and the value would not be less because they are worth but very little to start with.

The paraffining of cheese is without a doubt a great benefit to the cheesemakers, to the dealers, and to the trade in general. And I believe it has come to stay. But it should not be used to try to cover up the faults of the cheesemakers and the dealers.

It was first practiced by dealers in the east, Philadelphia and Boston dealers being the first to draw my attention to it. In the winter of 1895 and 6 while in the Dairy School at Columbus, Ohio, I tried to investigate the matter through dealers in Philadelphia who gave the work great praise, and said it was a success in every particular, and at that time were having three or four factories paraffining cheese for them in northern Ohio, and the same factories were practicing it last winter when I was there. I think I am safe in saying that two-thirds, or more, of the whole cheese trade today demand it.

In the first place, where and how should it be done? It seems to me the proper place is at the warehouse, or cold storage, just before the cheese are shipped, or put in cold storage, they should at least be kept cool enough after paraffining so they would not become heated or huffed. The cold storage is the proper place for them after they have been paraffined.

The paraffine that should be used should be that which is tested at a heat of 120 degrees or thereabouts. At this heat it seems to melt easily and is more elastic when on the cheese than that which is tested at a higher heat. It does not seem to check or scale off the cheese as easily while being handled and makes a nice smooth surface. The paraffine that is used at a higher test heat seems to leave the surface more rough; it has the appearance of little pimples on the surface of the cheese. It requires more heat to melt it, increasing the cost, and will not coat the cheese as thinly unless it is kept very hot during the applica-

tion. Any paraffine should be kept at a heat of 200 degrees all the time during the dipping of the cheese, and if wax is used at a test of more than 124 degrees of heat, the paraffine should be kept boiling all the time.

The least expense can be obtained by paraffining the cheese at the warehouse, or cold storage, where a large amount of cheese can be collected weekly A large tank can be fitted up in a convenient way with large capacity, with steam connections, having a coil of steam pipes placed in the bottom of the paraffine tank where it will come in direct contact with the paraffine, which will melt much faster, and will keep hotter with less fuel than in any other way. Do not use a double tank with hot water in the lower one as some did at first; it is more trouble, takes more heat and is not as satisfactory as when one heats direct from steam pipes.

Have a frame made to fit your tank so it will work up and down easily in the tank, adjusting with weights, and cords to correspond with the weight of the cheese to be dipped at each time, so that with a light pressure of the hands it may be forced into the melted wax and brought back with the weights very quickly. The cheese should be placed with its side resting on the sharp corners of angle iron while it is being dipped, and remain there after being brought out just long enough to cool the paraffine. Cheese should be just as well finished, free from face and side checks, the bandage pulled up smooth and even lapping over the corners about one inch; when such cheese are nicely paraffined they make a very nice looking package. Cheese makers should not think because cheese are to be paraffined that they can finish them in any old way. Like the Richland county maker who brought his cheese to the warehouse one day with the bandage of some of the cheese hanging down loose from the corners about three inches, not being pressed down on the corners at all. They were also face checked and ill shape. I asked him if he thought he could sell cheese in such condition. "Yes," he said, "what is the difference, you are going to morphine them anyway."

Twin cheese should be ten days old before they are paraffined, cheddar cheese a little older, and all small varieties could be paraffined a little younger. They should be kept clean and bright, circles removed. Many makers in our section do not use

circles; they leave the press cloths on until they are shipped, then they strip them off and box at once. They will not face check because they seem to have a heavier rind, which is very desirable for paraffining and cold storage use.

Cheese should not be allowed to mould before paraffining, if they do the mold should be removed by rubbing or washing, otherwise they look bad and will continue to mould under the paraffine.

The cheese boxes for paraffined cheese should be one-half inch larger than common boxes to keep the boxes from scraping the paraffine off the sides of the cheese.

DISCUSSION.

Mr. Aderhold: What do you mean by testing paraffine at different degrees of heat?

Mr. Noyes: There seem to be different heats at which it is tested, and that which is tested high is hard to melt, and when you do melt it you have got to keep it very hot in order to form a very thin scale. We have to take the man's word for it when we are buying, but you can tell after you buy a little while. The lower test seems to have a clear appearance; you can take it up and chew it like gum, and this is the kind you want. I would rather have it test down to 120 than higher. You need a thermometer at your tank to test it and keep it hot all the time. Heat it by dry steam. That is where many fail in paraffining cheese. I bought some this week and the paraffine was very thick on it, and it spoils the appearance of the cheese. If it is just a little coated and run into the pores and meshes of the bandage, that is sufficient.

A Member: How hot is paraffine when it is boiling?

Mr. Noyes: Two hundred and twelve degrees, or hotter. We try to keep ours boiling so that it rolls over all the time in the tank. We never commence paraffining before it reaches the 200 mark.

A Member: Why not paraffine the cheese about two days after taking from the press?

Mr. Noyes: I don't think they have quite as good a flavor. They have no chance of evaporation then, and that excessive moisture seems to bring a little different flavor.

The Member: Doesn't it depend somewhat on the moisture in the cheese?

Mr. Noyes: Yes; I stated that cheese that has a great deal of moisture would be better cured than those that have a less amount of moisture. Then we must not forget we want good pure air to keep our cheese in.

The Member: I had some cheese two days old paraffined, and when I cut it it had a sour flavor, but after that I never noticed it again.

Mr. Noyes: Probably that bad flavor left your cheese when you cut it. You will notice quite often when you first cut a cheese, there is a little flavor about it that you don't just like, and after it has been cut a short time that flavor leaves it.

A Member: Don't you have any trouble with condensed water in the tank, where you run the steam direct in the paraffine?

Mr. Noyes: Oh, no,we have a coil pipe running in the bottom of the tank and we have a pet cock, just enough to carry off condensation.

A Member: How old do you prefer to have cheese to be paraffined?

Mr. Noyes: Four or five days. Our dairy school have paraffined immediately from the press and had good results. As our experiments went on, they took some cheese from different sections, and they were very fine, paraffined immediately, and kept until thoroughly cured.

A Member: Last summer I had some paraffined cheese that seemed blistered and rubbed off.

Mr. Noyes: Didn't your cheese huff? Wasn't it kept too warm?

The Member: No, the temperature was down to between 40 and 50. We put some in an underground curing room, with a cold air duct, and the temperature was about 55. The cheese cured up nicely; they were fine as far as flavor and texture were concerned, but they were blistered on the outside, and the paraffine would rub right off.

Mr. Noyes: There is quite a good deal of moisture in some

of those cheese, and probably your heat was not great enough so that the rind commenced to decay. That is the only reason I can think of why the paraffine should slough off. It must have been the softening of the rind, rind rot, as we call it. You have got to have it hot enough so it goes into your bandages and just forms a thin scale over them. Did you remove the circles on your cheese?

The Member: Yes. What kind of paraffine do you use?

Mr. Noyes: Well, I couldn't tell you; we buy it from different houses. The principal difference in the paraffine that you buy on the market is the hardness of it, and you must test that by melting it.

Mr. De Land: I do not wish to criticise the statements that have been made by the speaker, still I claim that I know something about paraffining cheese. I claim I was the first one to paraffine cheese in the state of Wisconsin, and I have kept records of every kind. Now in regard to the melting point of paraffine, I know that 124 is better than 120, 120 is better than 116. It is a very simple matter to test. Heat your water in a ladle to 120 degrees, and put in it a piece of paraffine the size of a pea. If that wax melts, that is the degree of test; if it does not melt, it must run higher than 120, perhaps 124. Now, the harder the wax, the cheaper the wax. The difference between 120 and 124 is a half a cent a pound. The harder wax will make a more finished surface than the softer wax, especially in the winter, but for summer paraffining the harder wax is the better; in the winter any will do. I don't see the use of you factorymen rigging up any paraffine business. You are not gaining anything. You sell your cheese when they are about four to six days old. Now, what have you gained by going to this expense and paraffining the cheese? Let the dealers paraffine the cheese; they will do it and make a better job than you possibly can, as an average. As to the question of which is the best way—whether steam heat or a vat surrounded by water—I have used both, and if anybody can tell which is the better, he can do better than I can. I have one steam outfit where the coils are in the bottom of the tank and the paraffine is on top. The other one is surrounded by hot water and a flue underneath. Of course there is no water in the paraffine; I run the steam pipes into the tank. The curing of cheese does not mean alto-

gether the evaporation of the moisture; it is a chemical change which takes place within the cheese, it breaks down the curd. When these germs that start fermentation get to work, that is what makes a sharp cheese.

Mr. Noyes: The trouble about factorymen starting in to paraffine cheese is that they put up something cheap; they do not get their paraffine hot enough; they haven't the proper apparatus, and they don't get it even. In such a case, I would advocate having them paraffine at the warehouse.

Mr. Luchsinger: I assume that the practice of paraffining has not been uniform at the factory, and perhaps the majority of those present have not used paraffining in connection with the curing of cheese. I would like Mr. Noyes to state what is the advantage in paraffining cheese, and also can paraffine be used where it is necessary to salt the cheese after they are made.

Mr. Noyes: In regard to the last question, it certainly could not be done until you are all through salting. In regard to the benefit of paraffining, the greatest benefit is to keep them from moulding; it saves rubbing and washing. After your cheese have been in storage, even three or four months, they become solidly covered with blue mould, and that has to be cleaned off, and it does away with that labor. Besides that, it stops shrinkage to a certain extent.

Mr. Luchsinger: Does it not hurt the appearance of cheese that are not old? You take a cheese four weeks to two months old, won't they look better without paraffining when they come to be marketed?

Mr. Noyes: No, sir, not at all; they look better. It makes a nice finish on your cheese and helps to put a good rind on it.

Mr. Luchsinger: Don't you think a little more rennet would be a good plan?

Mr. Noyes: No, I don't. You don't want to use too much rennet where you require keeping qualities in your cheese. If you are going to sell your cheese very early, I would advocate using more rennet.

A Member: Where a man has got a basement curing room, wouldn't it be a good idea to paraffine the cheese? I have been using it at my factory because my basement curing room is very damp and the cheese mould badly. I find it is a great benefit to me, because I don't have to wash my cheese, and I leave the

press cloths on until I paraffine them, and then I pull them off. I generally calculate to paraffine them when they are about three or four days old, and I find it a great benefit. My cheese have gont to Chicago and all over and have kept in fine condition. How high can you allow the temperature to go up on paraffined cheese?

Mr. Noyes: It depends a little on the cheese.

A Member: I have found at my factory that 60 degrees is a little too high.

A Member: You can allow your temperature to go as high as you want, as long as you keep your cheese from huffing. It won't hurt if it runs up to 90.

Mr. Noyes: That is too high. I would like to ask if Mr. De Land would advocate having larger boxes where we paraffine?

Mr. De Land: It would be better whether paraffined or not. The crowding of the cheese into a box is a great damage to the cheese, and of course more so where it is paraffined.

Mr. Noyes: We order half an inch larger boxes at the present time, and I would like to make it a full inch. Of course, they must not be too large, or they will break. Oftentimes we have boxes that are so tight that it crowds the paraffine off the sides.

Mr. Van Leeuwen: A gentleman back here spoke about his cheese containing too much moisture and being sour. We make a firmer cheese, and I have had no complaint of the cheese being too moist. We make the cheese at the factories and paraffine them at the factory. At first we used paraffine that melted at a temperature of 114 to 116. Of course, our climate is hotter than yours. We find we do better with paraffine that melts at 122 to 124. We ship those cheese into our central curing room and it takes a day, sometimes two days, to get them in there. As a usual thing, we get refrigerator cars to ship them in, but we always calculate that part of our cheese are going south immediately and we make a very firm cheese. I don't know but what some of the Wisconsin makers have had a tendency to make a soft, weak cheese. Now, that cheese going into storage, green and new, if it is brought out at the end of four months, is not a cured cheese, and it will naturally show up in the same

way that a cheese that is five or six days old on the shelf does, with a kind of a sour taste.

Recess till 2 P. M.

Convention met at 2 P. M.

Acting President Powell in the chair.

Mr. R. C. Green asked to be excused from serving on the committee on resolutions, and the President appointed in his place Mr. J. F. Bachmann.

In accordance with the vote of Wednesday, the resolution with reference to making the publication of Mr. Rankin's the official organ of the association was taken up for action, and after some discussion the resolution was adopted, to the effect that the *Cheese & Dairy Journal* be adopted as the official organ of the association.

THE FACTORY OPERATOR: AN ORGANIZER FOR THE BETTERMENT OF RURAL COMMUNITIES.

PROF. R. A. MOORE, MADISON, WIS.

Mr. President, Gentlemen of the Cheese Makers' Association: When I look back a few years in the agricultural development of Wisconsin and note the active part taken by the cheese makers in bringing about the dairy prosperity we now enjoy I feel there are no obstacles too formidable for this energetic body to surmount.

Twenty-five years ago no one could have predicted the great dairy future of Wisconsin as she was then recognized as a grain-raising state and very little attention paid to that branch of agriculture that was to make her pre-eminent as a dairy state. You well know the struggle that followed and those who took a

prominent part in the controversy for pure cheese and dairy products in general.

Our success has been largely brought about by the combined efforts of many working along a single line of effort. This has been made possible by effective organization such as you have in your Cheese Makers' Association, and like organizations working as auxiliaries in behalf of the dairy industry. The Dairymen's Association has been a powerful factor in shaping legislation for the betterment of our dairy husbandry. The Wisconsin Dairy School through her training meted out to the enterprising young men from the different counties of the state has set her seal forever upon the cheese making of Wisconsin and determined largely the quantity and quality of the product.

Today as we realize that Wisconsin has 3,000 factories, over half of which are manufacturing cheese, producing approximately $6,000,000 worth annually, we begin to appreciate the importance of the cheese industry in the agricultural advancement of our state.

Wisconsin has been liberal in her recognition of the valuable work done by her factory pioneers and has from time to time made provisions to aid in the noble work. Annual appropriations have been made to the Dairymen's Association, to the Cheese Makers' Association and to the Dairy School for the sole purpose of placing dairying on a higher plane.

The state realizing the importance of proper dairy instruction for the successful pursuance of progressive work, maintains at great expense one of the most largely-equipped and up-to-date dairy schools in the world. That the young men from the farms appreciate the expenditure made for their especial benefit is attested to by an attendance of 350 annually taking work along factory or farm dairy lines.

For the opportunities afforded us we should repay in every possible way. At the most only a few hundred annually can take this work; it therefore becomes our duty to become dairy missionaries with the avowed purpose in view of making that community in which we labor better from the fact of our presence. Like the little district school and its sturdy teacher we can become a powerful factor in shaping educational and social affairs as well as financial enterprise in the circle in which we

move. Every factory operator of the state should be an organizer and thereby come in closer communion with his patrons.

The Dairy School realizing the social obligations due to patrons and the importance of frequent meetings have provided a course of training in parliamentary drill to be given to all students now taking its work. The object in view is to have each student so trained in parliamentary law as to enable him to organize and conduct a public meeting in a proper manner. It seems to me that in no one way can a young man endear himself to a community and make himself so pre-eminently useful as along this line of taking an active part in farmers' clubs and other associations formed for the purpose of inviting discussion on current topics.

Numerous jealousies that exist between patrons and false ideas that may have been grounded in the minds of many can be easily explained away in a public meeting by a tactful factory operator. Many defects that surely exist on the dairy farm could easily be remedied by a few hints and suggestions made in a clear and concise manner in a meeting where all were interested.

How many of the difficulties we now often labor under for weeks and months would be removed if we were only more public spirited. But you may say I am only paid for my day and a public meeting must necessarily be held in the evening in order to accommodate the majority and it consequently means labor for my already overworked body. I will say that no labor will be so refreshing and exhilarating and so well paid for as that spent in helping our fellowman. Money is only a secondary consideration compared to the veneration of a whole community and the self-satisfaction in knowing that we have in a measure sacrificed self and faithfully labored for the elevation of others.

But, you may say, I am willing and do not question the advisability of closer contact between the factory operator and his patrons but do not know how to make the first advance.

To those I would say that from past experience I have found that farmers and their families enjoy attending meetings when given an opportunity. The factory operator should be prime mover and should "lay his plans with care and execute with vigor."

He should not wait several months or years after going into a community before stirring public sentiment nor should he think that Mr. Brown, the teacher of the district school, will be present to criticise or point out defects in parliamentary knowledge. He should fortify himself with the truth that our schools are woefully deficient in regard to teaching the youth the proper manner of conducting public meetings and that very few understand even the first elements of parliamentary drill.

First Step.—Seek the acquaintance of two or three active farmers and make known to them the advantage of having monthly meetings and enlist their support. Secure from the proper authorities the privilege of using the town hall, school house, or other building suitable for meetings.

Second Step.—Draft a constitution under the following heads:

1. Name and object of Association.
2. Membership.
3. Officers, their election and duties.
4. Meetings of the Society.
5. How to amend the constitution.

The above can be in five articles, each article being subdivided into sections.

Arrange with those interested in your project to have the constitution drafted and ready for adoption at the first meeting. It is very essential that organization should be effected at the first meeting as farmers do not like frequent delays; this is especially true of dairymen.

Third Step.—Send invitation by parties carrying milk to factory, by letter or otherwise, that all factory patrons are invited to be present on a certain evening at a certain time. This invitation should be extended to as many as possible.

Fourth Step.—At the appointed time step forward and say: Gentlemen, the meeting will please come to order. I move that Mr. B. act as chairman. After the motion is seconded, put the motion to the house and no difficulty will be experienced in getting an interested party elected, who will immediately call for the election of a secretary and your meeting is temporarily organized.

You should then obtain the floor and give briefly your views in regard to the importance of holding monthly meetings, etc.,

and finally move the appointment of a committee on constitution, naming the members. This will usually carry and a motion for recess of 10 minutes in order to give committee time to report on constitution never fails.

With aid of constitution previously drafted committee can make minor changes if necessary and when meeting is called to order the chairman of committee reads the report on constitution and it is handed to chairman of meeting who has it read by secretary, one section at a time, and asks for changes, if any. After all sections are read and changed to suit, the business of the meeting will be on the adoption of the constitution as a whole.

Fifth Step.—After constitution is adopted officers are elected, complete organization effected and the association ready for active work.

Sixth Step. Arrangement of program. The party interested in the movement of public enterprise will usually be given a prominent place in the association, either president, secretary, or general adviser, consequently he will be depended upon for drafting a proper program. The following is suggestive as to what might be taken up with profit at the first meeting.

1. Remarks of President.
2. (a) Care of the dairy cow.
   (b) General discussion.
3. Use of the Babcock test by factory operator.
4. (a) Care of milk.
   (b) Discussion.
5. Business meeting.

It is well to vary the nature of the program from time to time so as to interest the young people, as well as the more mature. When this is desired, a few pieces of music, either vocal or instrumental, should be placed on the program, one or two recitations and a debate.

People respond readily and take a deep interest in anything that is done for the betterment of the educational development of their offspring, and with grateful hearts will always maintain a deep veneration for the promoter of good citizenship.

In reality the work we do in this world for the uplifting of humanity through the training of young people in the essential elements of good citizenship is the most important work of our

lives, and as we see our good work bear fruit and we feel that we have been instrumental in making the lives of others happier, it makes one feel that life is really worth living and that we have not lived in vain.

DISCUSSION.

Mr. Dewhirst: Just what kind of an association would you suggest as being most conducive to the combined interests of the patrons and the factorymen?

Professor Moore: You could call your association most any suitable name. The object is to come together for discussion, and, in a way, improve the social condition of the farmer. I feel that there is a great lack of that now, and there is no way that we can put forth more effort to hold the boys on the farm than to improve the social conditions. There are parties here in the room who know of an association of three hundred members, formed years ago in Kewaunee county with a small membership. We held forth for seven years in half of the towns of Kewaunee county, and today, if we were to look to the prominent people of Kewaunee county, those holding positions there as officials of the county and other high positions, we would find that over two-thirds of those who hold such positions at the present time are parties who took an active part in the affairs of that association. I often feel, when I look back on the work that was done during that seven years' time in holding meetings every two or four weeks in different parts of the county, getting people interested in public affairs, getting the young people interested in home affairs, I feel that that was the most glorious work of my life.

Mr. McKinnon: Would you advise having both sexes in such organizations?

Professor Moore: I certainly would. Give the farmer's wife an opportunity to attend, because she is very often the most important factor of the family.

Mr. Mason: Have you anything in the form of a guide that we can go by in forming such a society?

Professor Moore: I have never got out any special work. I am at present giving the force in the Short Course in Agriculture and in the Dairy School, preliminary drill. We use Roberts' Rules of Order, which will usually answer anything which may come up in a public meeting. I think if you go on and organize in accordance with the outlines which I have given today and then use Roberts' Rules of Order, you will have no difficulty. All it wants is a little energy. It is not your educational abilities so much as the desire to do good and put some energy and spirit into your community.

Mr. Luchsinger: I heartily second the idea that is contained in Professor Moore's paper. You will find in every meeting as large as this and larger, that comparatively few men take an active part, perhaps ten per cent. of the whole. Now, it is not because those men are any wiser or brighter or have any more experience as business men, not at all; the silent ones sometimes have a great deal better thoughts, wiser thoughts than those who talk. The difference is simply this: those ten per cent. know when to speak, how to speak, in what order to speak and that gives them the courage to speak. The others know just as much and that is all the difference there is. Any one of you who has had only a partial preliminary training would have the courage to express his thoughts. The language would come to you, don't worry about that; if you have any thoughts the language will come, and help you express your thoughts in proper shape, so as to be fully understood. This country is governed by the people—all the people can't govern it, but those who know something about the rules of order and when to speak and how to speak are the ones that govern, they are the ones that have the greatest influence in every way, socially, politically and in business.

ADDRESS.

LAWS RELATING TO CLEAN AND SANITARY CONDITIONS IN CHEESE FACTORIES.

PROF. J. Q. EMERY, STATE DAIRY AND FOOD COMMISSIONER, MADISON, WIS.

I am sure it would be more agreeable to all present, if instead of speaking on the law, I could have been assigned the duty of proclaiming the gospel of cleanliness in Wisconsin cheese factories. That cleanliness is next to Godliness is an old and familiar maxim. In its application to cheese factories I am of the opinion that it would not be too much to say that cleanliness *is* Godliness.

I am quite sure that the cheese makers who attend this convention are not the ones who most need instruction as to the laws relating to cleanliness in cheese factories. The cheese makers who never attend the meetings of this association are the ones most needing such instruction. Perhaps some of these will be reached through the volume of your published proceedings. Others may be reached by the inspectors and possibly by the constable.

That scrupulous cleanliness in cheese factories, their floors, walls, vats, pipes, cheesemakers, in the milk received and mode of manufacture, is absolutely necessary to the highest quality of the product, is a matter of common knowledge and general assent. In theory it has been so long and generally admitted and in practice so much neglected, that the legislature of the state no doubt concluded that a law with adequate penalties for its violation might doubtless be made to contribute to the securing of so necessary and profitable a condition, and chapter 67 of the laws of 1903 was in consequence enacted.

Section 1 of that chapter defines unclean and unsanitary milk as follows: "Milk which shall be drawn from cows that are kept in barns or stables which are not well lighted and ventilated or that are filthy from the accumulation of animal refuse or from any other cause, or from cows which are themselves in a

filthy condition, and milk in and from cans or other utensils that are not kept in a clean and sanitary condition, or milk to which has been added any unclean or unsanitary foreign substance, is hereby declared to be unclean and unsanitary milk."

Section 2 prohibits the sale or delivery to any creamery, cheese factory, etc., of such unclean and unsanitary milk, as follows: "No person, firm or corporation shall knowingly offer or expose for sale, or sell, or deliver for sale or consumption, or to any creamery or cheese factory or milk condensing factory, or have in his possession with intent to sell any unclean or unsanitary milk." The unclean or unsanitary milk referred to in this section is the unclean or unsanitary milk as defined in section 1 of that act.

Section 3 prohibits the manufacture for sale of articles of food from unclean and unsanitary milk or cream from the same, as thus defined, in the following language: "No person, firm or corporation shall knowingly manufacture for sale any article of food from unclean or unsanitary milk or from cream from the same."

The first section of this law is intended to reach the dairymen who produce the milk or cream for delivery at creameries, cheese factories and city milk supplies. Section 2 is intended to reach the same class and also all persons who sell or deliver milk for sale or consumption to cheese factories, creameries, etc. It is the purpose of section 3 to make it imperative upon the operators of cheese factories and creameries, that they reject from their factories all unclean or unsanitary milk. The law is evidently intended to be a stimulant to spinal columns. If the cheese factory operator allows unclean or unsanitary milk to go into his cheese product, he can not shift the responsibility upon the patron, because the law places it upon him. Should he plead ignorance as to the quality of milk he receives, he is to be reminded that through the use of the Wisconsin curd test taints in milk from filth or other causes are readily detected. The legislature evidently intended by this act, calling into use as it did the exercise of the police power of the state, to protect the great consuming public against filthy and unsanitary food products. Incidentally its effect is to improve the quality of the cheese product and thereby to enhance its market value.

Section 4 of that act defines unclean and unsanitary conditions in cheese fatories, creameries, etc., and requires the owners or managers thereof to keep the same in clean condition. The provisions of that section are as follows: "All premises and utensils employed for the manufacture or sale or offering for sale of food products from milk or cream from the same which shall not be kept in clean and good sanitary condition are hereby declared to be unclean and unsanitary. Any milk dealer or any person, firm or corporation, furnishing milk or cream to such dealer, or the employee of such milk dealer, and any person, firm or corporation or the employee of such person, firm or corporation, who operates a creamery, cheese factory or milk condensing factory, or manufactures, reworks or packs butter for sale as a food product, shall maintain his premises and utensils in a clean and sanitary condition."

Section 5 of that act requires the emptying and cleansing of cans, bottles and vessels which have been transported over any railroad or boat line, where such cans, bottles or vessels are to be returned.

Section 6 provides a punishment by fine of not less than twenty-five nor more than one hundred dollars for each and every offense and in default of payment imprisonment in the county jail not less than thirty days nor more than sixty days.

It is thus made apparent that the violation of any provision of this law is a *quasi* criminal act and is an expression of the judgment of the legislature upon the conduct of any one who shall maintain a cheese factory in an unclean or unsanitary condition or who shall manufacture cheese from unclean or unsanitary milk. Who can say that the judgment or condemnation is too strong?

Section 1410a of the Wisconsin statutes of 1898 makes it the duty of the state dairy and food commissioner to enforce the laws regarding the production, manufacture or sale of dairy products. Section 1410b, statutes of 1898, confers upon the commissioner, his agent or assistant, free access to any barn or stable where any cow is kept or milked, or to any factory, building, dairy or premises where any dairy product is manufactured, handled or stored, when the milk from such cow or such product is to be sold or shipped, and confers upon him authority to enforce such measures as are necessary to secure perfect

cleanliness in and around the same and of any utensils used therein. It is further made his duty by law to prosecute those who may be found violating the dairy laws of this state.

Section 4607, statutes of 1898, prohibits the sale or delivery to factory or creamery of any unmerchantable, adulterated, impure or unwholesome milk, and section 4607a, statutes of 1898, fixes the standard for purity of milk by providing that milk which shall contain less than three per cent. of butter fat, or that has been diluted, or any part of the cream of which has been abstracted, or that, or any part of it, was drawn from a cow known to have been at the time it was drawn within fifteen days before or less than four days after parturition, or which was known to have any disease, ulcers or other running sores, shall be held or found to be unmerchantable, adulterated, impure or unwholesome, as the fact may be. The penalty fixed for violating this statute is the same as that before given.

I have thus briefly enumerated the salient features of the laws of Wisconsin relating to clean and sanitary conditions in cheese factories.

Referring to the articles of incorporation of this association, I find it stated that the business, purpose and object 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 cheese making.

It must be conceded that the number of inspectors provided for the state dairy and food commission is not adequate for the absolutely complete enforcement of these laws. It is believed that progress has been made during the past year. An assistant chemist and two inspectors, one of whom is a dairy, creamery and cheese factory inspector, were added to the commission. In addition to this the dairy and food commissioner was authorized to appoint the traveling instructors now employed by the Wisconsin Dairymen's Association as his expert agents, thus clothing them with all the authority possessed by the dairy and food commissioner himself. It is believed this law, practically providing for a corps of five instructors or inspectors, more than doubles the effectiveness of the former force. But this force is considered much too small and when our great number of cheese factories and creameries is taken into consid-

eration, is much less than the force employed by state dairy and food commissions of neighboring states.

How to provide the requisite inspection of Wisconsin cheese factories and creameries is in my judgment a highly important problem now pressing for solution. This matter is alike important to producers and to the consuming public.

With the prosecutions to be made and the other interruptions that must inevitably occur, one man cannot inspect more than five cheese factories or creameries in a week and do the work with the thoroughness with which it should be done. This requires that the inspection should begin in the morning with the delivery of the milk as it is conceded by all that unless the quality of the milk delivered is of the highest the quality of the product must suffer.

It is possible that among Swiss cheese factories where milk is delivered morning and evening and the factories are close together and the number of patrons of each is comparatively small, two factories a day or ten to twelve factories a week can be properly inspected. I believe that not to exceed 250 cheese factories or creameries can be properly inspected by one man in a year. At that rate it would require twelve men to inspect once a year the 1,800 cheese factories and the 1,200 creameries in this state. But once a year is not often enough to inspect them. Twice a year is not sufficient; yet to inspect them twice a year would require not less than twenty-four competent, energetic inspectors.

It may be profitable for us to consider what some of our neighbors are doing in this line of work.

The province of Ontario has 1,000 factories. Sixteen traveling cheese instructors are employed. They find this number insufficient and unsatisfactory and wish to increase it. Each cheese instructor gets from $700 to $1,000 for the season. There, a traveling cheese inspector watches a group of from 20 to 30 factories. Some of these he visits but once in a season, others as often as once a month, the number of visits depending upon the necessities of the factory. He gives counsel, sees that the factory is kept clean, and by reporting to the proprietor or the farm owners, is able to weed out the poor cheesemakers and

encourage and stimulate the worthy ones. He has no absolute powers, his work being strictly advisory.

The province of Quebec has about fifty traveling cheese instructors. Here, the dairymen are largely of French descent, and the cheese factories are smaller than those in the province of Ontario and relatively more numerous. Here a different plan is followed from that in Ontario. The cheese factories are allowed to form "syndicates," so-called, that is, twenty-five or thirty factories near together are allowed to form an association for hiring a traveling cheese instructor. If they hire one approved by the government, the government will pay toward his salary up to the limit of $250, but not more, and not more than half his salary in any event. The instructors receive from $600 to $800 for the season. The difference between the government allowance and the total amount of salary is met by the factories themselves. Thus it will be seen that the provincial government of Quebec pays out not more than $12,500 annually for these traveling instructors while the patrons of the factories themselves must pay at least $20,000.

Are there not suggestions here that Wisconsin can make use of to her great profit? Wisconsin is a great dairy state. She has the largest number of creameries and cheese factories of any state in the union. In total volume of dairy products she ranks second. Draw a line from Prescott on the Mississippi river eastward through Marshfield to the northeast corner of Kewaunee county and the portion of Wisconsin south of that line is the richest dairy country, of equal area, in the United States. Can Wisconsin hold her prestige as a dairy state by supineness? Improvement in quality and uniformity is needed. If this association, the Wisconsin Dairymen's Association, the Wisconsin Butter Makers' Association, the Dairy School, the State Dairy Commission, and the State Dairy and Agricultural press could unite and co-operate in an effort to increase the number of instructors or inspectors in cheese making and butter making on some such plan as that of the province of Quebec, could not a progressive movement be thus inaugurated and success achieved?

In high schools, graded schools and the county training schools for teachers, and the county agricultural schools, day schools for the deaf and other enterprises, the state co-operates

and rewards local effort. Why not in the work of bettering dairy conditions?

I most respectfully urge a consideration of these suggestions by this association. It seems to me that greater co-operation by the agency above named, on definite lines that seem most urgent, particularly in the matter of cleanliness and sanitary conditions in our factories, would result in a higher degree of progress.

But equally with laws in relation to cleanliness and good sanitary conditions, there are needed high ideals and public sentiment demanding their enforcement and realization. In creating these high ideals and public sentiment among patrons, a broad field of usefulness is open to cheesemakers. My appeal is that you do not allow yourselves to float along on the tide of a low public sentiment, but that you seek by every possible effort to make public sentiment what it should be and that you seek to create for Wisconsin cheese making the very highest possible ideals, the greatest degree of cleanliness possible and the very best possible sanitary conditions.

Mr. E. L. Aderhold called to the chair.

DISCUSSION.

Mr. Swingel: I would like to ask Professor Emery how to prevent the farmer from feeding food that is not the proper thing for cheesemaking. I have been bothered with my patrons feeding rape and turnips, and it is pretty hard to avoid those things, because rape will increase the flow of milk. I have worked hard and have induced about two-thirds of them not to raise it, but the other one-third are bound to feed it and that makes it unjust to the others who do not feed it.

Professor Emery: That is quite a problem. I suppose I might go back to the time when the question was up in this country as to the resumption of specie payment and Horace Greeley gave that renowned counsel as to the way to resume

specie payment. He said the way to resume was to resume. Suppose we could use authority as cheesemakers to refuse to receive the milk. It is not always wise to use authority. I am of opinion, though I have not had experience in cheese-making, that if I were running a cheese factory I should insist upon the highest quality of milk, and I should reject the inferior milk. I would try to manufacture the very highest quality of product and get the highest market price for it. I don't know that that answers your question.

Mr. Swingel: Is there any law with reference to that subject?

Professor Emery: It is unquestionable that they can be prohibited from feeding unwholesome food, but I think there is no question upon the right or authority of the manufacturers of cheese to reject from the factory a grade of milk that they regard as inferior and doing injustice to the other patrons. Of course, it would be very profitable if all cheese factories would act together in this matter, so that a person sent away from one factory could not go to another. We had a man who took his milk to a creamery in filthy cans in violation of the law. It has not been the policy of the Commission to become aggressive and at once prosecute a man at the first offense, but the inspector in this case, as in others, called his attention to the filthy condition of his cans, and instead of taking the suggestion in good part, he brought his milk the next morning in the same condition and abused the inspector for interfering with his rights. He threatened to go up to another creamery if he couldn't leave his milk there, and the inspector told him if he took it to another creamery in filthy cans he would be prosecuted. He took it there in filthy cans, and was prosecuted. Now, I do not think that the prosecution of the law is the most potent thing. I think that high ideals and instruction would prove much more valuable in most cases, but at times the law has to come in with its force.

Mr. Everett: It appears to me there might be a possible remedy in this matter of feeding rape. I see Professor Farrington in the room, and I wish he would tell us whether or not there have not been experiments made at our Station or other stations in regard to feeding rape to milch cows, and its

effect upon the quality of the milk, and how, if possible, it may be avoided?

Professor Farrington: I think that the same experiences have been met in regard to the feeding of rape to cows in the use of the milk for making both butter and cheese. We have made some experiments at Madison at the Dairy School. Now, as I remember the results of those experiments, we did not find that the rape flavor was noticed to such an extent in butter as it was in cheese, and in a good many cases rape can be fed to cows and the milk used for butter making exclusively. But I think that in cases where we made cheese of the milk from cows fed rape, the flavor was quite prominent in the cheese. I think the point that Mr. Everett wants to bring out is that with such foods as rape and others that have a strong flavor, they may be more successfully fed after milking than before, and you may overcome the effects that they cause in the products made from such milk by feeding it after milking.

Mr. Luchsinger: This gentleman who has had trouble on account of the flavor imparted to his cheese by reason of the cows being fed rape, that gentleman may be an employe of some of these patrons or he may be a cheesemaker for a so-called co-operative factory. If that is the case and one-third of his patrons feed rape and the other two-thirds do not, and the quality of his cheese is thereby injured, his course would be to get the influence of the two-thirds on his side and show the other third the injury they are doing to their neighbors as well as to the cheese maker. If he is the buyer of the milk or if he works for a man who does purchase the milk, his remedy is to refuse to take the milk, reject it. Down in our city the milk condensing works have been in operation a number of years. They are very much more particular than any cheese factory or creamery can ever be in requiring good flavored milk, and the way they enforce this is that they have an inspector who receives the milk and he immediately rejects any milk that is brought there that has any taint or odor of rape or any other offensive odor, he sends it back and there is no appeal. That is one of their printed rules which the patron subscribes to when he agrees to bring milk to that factory. It may be that the patrons of the condensing factory will obey their rules more strictly than the rules made by a cheese factory, for the reason that they usually

pay from ten to fifteen cents per hundred more for the milk than is paid by any cheese factory or creamery. They make it an object for people who sell milk to bring milk just as the rules prescribe, and I don't see why the same rule should not apply in the case of a cheese factory.

The Chairman: We are drifting a little away from the subject. Professor Emery has clearly indicated that there is need of a much larger force of inspectors. I think it would be pertinent to discuss that subject, How can we increase the force of inspectors?

Professor Farrington: I would suggest that the members of the Cheese Makers' Association here assembled request some one of the members, perhaps Mr. Luchsinger, to draw up a resolution as an expression of the members here, requesting the powers who have the authority, to increase the number of inspectors.

The Chairman: Mr. Luchsinger is one of the members of the committee on resolutions, and if there are no objections I will direct him to embody those ideas in a resolution.

Mr. Mason: It seems to me that the inspectors in cheese factories should be controlled by this Cheese Makers' Association. I think they ought to make the appointments; they certainly are better fitted to know who is the man who would make the best cheese inspector.

The Chairman: That is all right, but the Cheese Makers' Association couldn't pay anybody; so that is out of the question.

Mr. Everett: It seems to me that it ought to be taken out of the hands of the Cheese Makers' Association, as an Association altogether. The state must pay those inspectors and they should be appointed by the Dairy and Food Commission and empowered to act as becomes necessary. It may be proper for this Association to recommend.

Mr. McKinnon: The idea was brought out here the other day that in Canada, in one of the provinces, the state appropriated so much money towards bearing the expenses of the cheese instructors and that the patrons united in making up the fund to pay the remainder, and it struck me as a very good idea, we can't expect the state to do everything for us. I hail from Sheboygan county, and I know what the wants of that

county are pretty well, and I know what assistance the cheese instructors have been. Two or three years ago I had Mr. Aderhold visit my factory as often as he could. He charged me a little something every time, I think about six dollars, but if I could have had the same guidance in my factory for the last two years that I had under Mr. Aderhold's supervision, it would have been hundreds of dollars in my pocket, besides being of great satisfaction to me, and we sometimes work for satisfaction. I presume that a great many of the factory men here have had cheese in their factories that were not first class goods, but they have to sell them, as a matter of course. Now, we not only have to sell that cheese below the price of good cheese; we not only have to suffer the loss in that direction, but we have to suffer in our minds, and I tell you, gentlemen, it is very humiliating to me to know that my cheese are a little poor and that I have got to take a reduction. In fact, that part of it hurts me worse than the financial loss. Now, I believe this kind of thing can be largely remedied by having more instructors. Mr. De Land and myself are on the committee of legislation, and I have no doubt that Mr. De Land, as chairman of the committee, will be glad to use his influence if we can; we will both use our influence to get an appropriation made along this line so that we can have cheese inspectors as we need them. Two or three inspectors for the great state of Wisconsin is not a drop in the bucket. We need a great many, and it would be money well laid out if we had a full corps of working inspectors in the state of Wisconsin.

INSTRUCTION IN CHEESE FACTORIES IN WESTERN ONTARIO.

PROF. G. H. BARR, STRATHROY, ONTARIO.

Chief Instructor for Western Ontario.

Mr. President, Ladies and Gentlemen: I need scarcely say that when I received the very kind invitation from your Secretary to come over and see the cheesemakers of Wisconsin at

their convention that I was quite pleased. It has been one of my dreams for a number of years to come over to Wisconsin,—through Governor Hoard who has been with us a number of times at our conventions, and whom I am sorry to say we cannot get over there any more,—I don't know why, you seem to keep him so busy over here. But we used to enjoy Governor Hoard's addresses more than those of any man we had to address our conventions over there.

Another man you have in Wisconsin whose name is known throughout the whole of America, Dr. Babcock, and the fact that these two men were in Wisconsin, besides knowing something about your work here, always made it a fascinating idea for me to come over to see you. I am very glad that I am here now, and I have been very much interested in your papers and discussions. I cannot see how anybody could go away from here and not be a better workman than when he came, a better cheesemaker and a better citizen.

One of the features that strikes me as a stranger is this, that you have so many young men. If you came into one of our conventions, you would see a good many gray-headed men, some of them getting very bald, and there are so few of such here that it strikes me that there must be an immense work here with so many young men starting out in business and working along the right lines and you have a great work to do in starting these young men and keeping them along the right lines, and if I can help in any way by telling you what we are doing, I will be very glad to do so. We are not jealous of anybody that I know of. If you have got a good thing in Wisconsin, and we hear tell of it, we will come after it and use it quick, because we want to be second to none. I hope to take back a good many ideas with me, and the custom house officers will have a hard job to get any duty on them, too.

During the past fifteen years the system of instruction carried on in Ontario was that the instructors were engaged by the Dairymen's Association. Application was made by factory men for their services at the rate of from three to five dollars per day. Their duties were to test the milk for adulteration, and prosecute any patron found tampering with the milk, and if any time was left, give instructions on making the cheese; very little attention was given to uniform methods of instruction.

This caused an uncertainty among the makers as to the best methods, as one instructor would teach a certain line, while another would say it was wrong. There was no attention given to assisting the patrons in any way. The quality of milk delivered at factories kept getting worse instead of better. During the past season the system of grouping the factories for instruction purposes was adopted. An instructor was appointed to give instruction at from twenty to twenty-five factories, and visit each factory in the group as often as possible. Each factory agreed to pay a fee of $10 for the season. Four such groups were formed, with an instructor for each group who visited each factory once a month. A chief instructor was appointed by the Department of Agriculture to superintend this work, and see that uniform work was being done in each divison. To assist in getting uniformity, before the season's work commenced all the instructors took a ten days' course at the Guelph Dairy School. This course is certainly along the right lines, as all the instructors agreed on a uniform line of work to be carried on. Each detail of the work was thoroughly discussed and a certain line agreed upon, each instructor making the same note on the subject. In this way all instructors started out on their work with the same methods on making the cheese, and doing any other work in connection with instruction, and by the Chief Instructor spending several days each month in each group, quite uniform work was done. Each instructor carried an acidimeter and twelve glasses for making curd tests. Our system of reaching the patrons was to examine each can of milk as it was weighed in at the factory, and if any objectionable flavor was noticed, take a sample and make a curd test of it, and in the afternoon the instructor would go and visit those patrons. In this way those sending tainted or bad milk were reached, and given proper information to overcome the difficulty. When it was not possible for the instructor to visit all the patrons, this card was sent to them. The instructor tested the milk where requested, but did not do any prosecuting for adulteration. Meetings of the patrons were held at as many factories as possible, and were addressed by the instructors. These meetings are a splendid thing, and do much to stir up the patrons to do better work. A strong effort was made by the instructor to get the cheesemakers to keep themselves and factory in a nice,

clean, tidy condition, and also to get the factorymen to improve the buildings and equipments, one of the groups spending during the year about twelve thousand dollars in buildings and equipments; another over six thousand dollars. At the suggestion of the instructors paint and white-wash were used in such a way that some of the factories were improving wonderfully. Cement floors and cool curing rooms are the main improvements being made. During the fall, when the cheese makers were not very busy, meetings of the makers and factory-men were held in each district, to discuss the system of instruction, improvements to be made in it, and also the making of cheese. These meetings were very interesting and better discussions took place at them than at any convention. A resolutive marked improvement was noticed in the quality and finish of cheese in all the groups. The system is giving good satisfaction, and will be extended over the whole of Western Ontario next year.

DISCUSSION.

Mr. Van Leeuwen: When do you have that meeting of inspectors of which you speak?

Professor Barr: We had it in the beginning of April last year. As soon as the dairy schools close, we have all the inspectors gathered together. There is another thing we have, which I believe is a step in the right direction. The men who are on the road in the summer-time inspecting, go into the schools in the winter-time, and in that way we give the instruction in the schools in the winter-time and meet the same students who have gone out to the various factories in the summer-time. That has been one of the weak points in our system heretofore, that the men who were instructors in the schools were not the men who were on the road, and sometimes there were conflicting opinions and methods, didn't always work harmoniously. We are trying to get over that now.

Mr. Wallace. Where can I obtain an acidimeter?

Professor Barr: I would rather not go into that question, I take that up tomorrow. We have a very nice outfit, a little

canvas case that our inspectors take with them, which holds this acidimeter with the glasses. We found it not necessary to carry a whole lot of glasses, because our factories would provide glasses when they found it was necessary. You can get such an outfit, nicely gotten up, by addressing Alec Stewart, Guelph. He is putting up the acidimeters that we use.

Professor Emery: I understood that these inspectors were paid in part by a fund contributed by the cheese factories. Who pays the remainder?

Professor Barr: The Ontario Department of Agriculture give a sum of $4,000 to the Dairyman's Association and that is applied almost altogether for instruction purposes. That was one reason why we were not able to put on more men this year. We are paying our instructors $800 for the season of about six and a half months. These instructors are all engaged subject to my approval, and I stick out for a good salary for them. I think one of the weak points in our system has been that they have not been getting enough money, you can't get the right men. They pay their traveling expenses, which are not very much, because our factory men people put them up. They drive a horse and buggy and the factory men nearly always put them up while they are staying with them, and their expenses are pretty light, perhaps in the neighborhood of $150 for the season. You see that gives them over $100 a month for the summer season, and then they go into the school during the winter. I am also trying to arrange that those whom we cannot take into the school, will go on the Farmers' Institute work during the winter, and in that way we will carry information to the farmers.

Mr. Dewhirst: Does the Dominion Government give you any assistance in Ontario?

Professor Barr: No, they have not done so in the past. This year, I believe they are going to send two men all over the country holding meetings.

Mr. Dewhirst: Hasn't there been a noticeable improvement in the quality of cheese in Western Ontario as the result of your increased inspection?

Professor Barr: There is an improvemet in the uniformity of the cheese. You must remember this is the first year and

it takes time to get started, but even after the inspectors had been working only four or five months, I took a trip around and I was surprised to see how close the cheesemakers were coming together in their methods. The cheese are becoming more alike, the finish is becoming more alike and we believe that this thing will go on more and more every year. A year ago I had charge of what they called the "model" district. It was taken up entirely by the Department of Agriculture, and they paid all my expenses just to see whether an improvement could be made in the quality of the cheese by grouping the factories, and Mr. Tupper in Eastern Ontario and I in Western Ontario, were able to make such improvements in those two districts that the system was adopted all over Ontario this year. You see this is the way it works; we find out, if we can, the best method of making cheese,—not my method of making cheese, but the best method we can gather from Wisconsin, or Quebec or anywhere else, and then we get them all into one line. Our object is that we have every maker in Ontario manufacturing his cheese that way, and the result will be that if we carry out the details closely enough, we will have every cheese in every factory the same, then we will be able to bring to the market in the old country so many thousand boxes, all practically alike. I will not be satisfied until we are able to show that we have all the cheese in Western Ontario or Eastern Ontario made on the same line, about the same size, finished, showing up a nice, clean, uniform lot, and all these things we will be able to show to our customers in the old country and to say to them that they can buy just as many thousand boxes as they like and find them all the same. When we get the whole of our output up to our best output, we will be satisfied and not before. Of course, we only make one style of cheese, practically; all the cheddars are made for export. In Western Ontario there are only five or six factories making for the local trade and they are no credit to anybody.

Mr. Mason: Then those factories that receive instructions from the government, must absolutely give themselves up to follow those instructions, I suppose?

Professor Barr: As near as the instructor can make them. I hope we may be able to copy your legislation. We may be a little slow getting there, but we keep moving. If we had the

legislation behind us that you have here, I don't know what it would be worth to us. I have gone into factories this summer that I would have given a good deal myself to be able to say, "You will close up this factory right now." As I understand, if a factory is not right in your state, you can say to them, "You must fix it right, or quit business." If we had that over there, we would be able to revolutionize the cheese industry in a short time. I am quite satisfied if you carry out the legislation you have behind you here, we will have to get a hustle on to keep ahead of you—excuse me, I wouldn't like to admit that we are not ahead already.

Mr. Aderhold: That remark is all right; you are ahead of us. There was a time when you were much farther ahead of us than you are now. Since our Dairy School has been in operation, we have improved very rapidly, so that we are not today so far behind the Canadians as we have been, but if we trot along at the gate we are trotting now and do not take up the methods suggested by Professor Barr as to cheese instruction and refuse to take milk that another factory has rejected, we will find you will run away from us pretty quick. It behooves us to find some ways and means of doing just about the same things you are doing over there.

Mr. Everett: Do your instructors hold evening meetings and instruct the farmers, talk to them?

Professor Barr: Yes. We find the patrons very hard to reach. We find considerable difficulty getting them out to listen. I ran all over the country this year attending as many meetings as I could. The patrons were invited to come to the factory and bring their wives with them, and let me tell you, if you ever go into this business, get out the women. The remark has been made here that they are an important factor, and they *are* in the cheese business. If you can get the women, the women will get the men, and they will get them right. Our method of work is this: In the spring the instructor goes around and makes a kind of a running visit, finds out how they are all shaping, and tries to make dates for a meeting the next time he comes around. If we can get the patrons out to that first meeting, we explain the work to them, tell them what they have got to do, then when they come around later, they know something about what is ahead of them, but if the patrons

don't know anything about what you want of them, you have to start in entirely fresh. Get the patrons out and explain to them in a kind way—by the way, I wouldn't keep a man on the road two days that couldn't go to any patron and talk to him without losing his temper. They have got to keep calm; they must not antagonize the farmers to start with; that is one of the points we particularly make. When you can meet the patrons in that friendly way, you will get their sympathy to start with. Of course there are times when you have to bear down on a man to get the best out of him, but I believe this, that the more intelligent a man is, or a woman, the finer you have got to use them, and I believe if you can show a man the right way and get him quietly started on it, it will do more for that man than if you go at him hammer and tongs, and say, "You must do so and so." You must first get them to thinking right, to see the object of all these things and when you have once convinced him, you have got him for all while; while if you push, the harder you push the farther away he will get from you.

Mr. Aderhold: Have you samples of curd made with the curd test at your farmers' meetings?

Professor Barr: Yes, we try to have samples at the meetings and we also take a sample of the curd test to the patrons when we go to visit them, and that is one of our strong business points. It is pretty hard to convince a farmer that his milk is wrong, simply by telling him it is wrong, but if we take a sample of the curd made from that particular milk, along with a sample taken from good, clean milk, in that way we are able to convince them that their milk sent that morning is wrong. I have found in my work that is the only way we can convince a man or a woman either, and I again emphasize the woman part of it, because many of the farmers will say, "You go and see my wife."

Mr. Waterstreet: How often do you hold meetings in one factory during the season?

Professor Barr: We try to hold two, one in the spring and one in the fall.

Mr. Waterstreet: How often does the instructor visit the factory during the season?

Professor Barr: This year we were able to visit some of

them seven times; all of them six times, once a month; and if an instructor went to a factory and found that the make was off, if he found he could not fix him right in one day, he staid there until he got the man running right again. No limit was placed on the length of the visit.

Mr. Mason: What are the usual wages paid in Canada for cheesemakers?

Professor Barr: Well, they are not any too good. We have very large factories there. A majority of them this year will probably average 200 tons of cheese in the season, and we have some that will go 250 or 260 tons. We have very few under 50 tons. Those making in the 200-ton factories get from 70 to 80 cents per hundred pounds of cheese, and that is where our best makers are. Then we drop down to the 100-ton factory, in many cases the makers are only getting about 80 cents, some of them under that, and they furnish everything for that, except the factory. They do not furnish the factory or draw the milk for that. The maker is hired by the one hundred pounds, and he provides fuel, boxes and everything for about 80 cents a hundred, and I know some that are making for less than 70 cents.

Mr. Mason: Then it would be to the maker's own detriment to turn off milk?

Professor Barr: Yes, that is true. The largest number of our factories, especially in the Ingersoll district, are owned by private individuals, the makers themselves owning the factory. They are makng up cheese for one cent, providing all help, marketing the cheese and the patrons draw the milk. So our patrons in that section are getting splendid returns. Where a maker makes two hundred tons, he can well afford to make it at one cent a pound. Some of our makers are doing pretty well, but the majority are not well enough paid.

Mr. Aderhold: Do they have a decent house to live in?

Professor Barr: Some of them do. Too many of them live up above the curing room and some of them you can see through all around. However, our houses are becoming very much better. We keep at them and they get ashamed, so the makers are getting better houses and many are making their factories much more attractive, planting nice lines of trees and

having flowers and pretty lawns. If there is anything in the world that will give the right kind of a reputation to the cheese maker, it is the keeping of his cheese factory and the surroundings nice, clean and decorative. You will find the farmers around will begin to brush up their own places, fix up their lawns and make little flower beds. They see the factoryman doing it, and they know he is a busy man, and they say to themselves that if he can do it, we can spruce up a little bit ourselves; but some of our cheese factories, the surroundings are such that there are not many farmers who would be willing to keep their places in the same condition. I tell you if the time ever comes that I can get some of these fellows out of business, they will go out; these dirty men will get no factories, if I can help it. On the other hand, we have factories where you can go into them and the floors are dry and clean. The maker himself is wearing a nice clean apron, everything looks nice and tidy, and the trouble about it is that he is getting no more money than the other fellow. I went to a factory last summer; the man was in trouble, and after looking around his factory, I asked him if he was going to have a patrons' meeting there, and he said, yes. I said, "It will be the worst thing you can do, for I shall tell them just what kind of a man you are, and what kind of a place they are bringing their milk to." He got good nice milk in a place where you could shovel out the dirt. I told him I never would address a meeting in a place in the shape that that was. He says, "Can I have a visit from the inspector?" and I said, "You can, if you will clean up." But that man wasn't fit to dig ditches. He didn't know anything about real cleaning; he was a disgrace to our trade. I don't suppose you have any of that kind.

Mr. Knickerbocker: Not this time of the year.

Professor Barr: Gentlemen, we as cheesemakers do not realize the important part we are playing in this world and we ought to wake up to it.

Mr. Waterstreet: How much does the cheesemaker have to give the inspector for his visits?

Professor Barr: The factories pay $10, and, of course, the factorymen generally put up the inspector, give him his meals

and bed. That is the custom in Western Ontario. In Eastern Ontario they get $15.

Mr. McKinnon: Did you board at that last factoryman's house?

Professor Barr: That man had a real nice wife. Really, as a rule, if your cheesemakers will get the right kind of a wife, their factories will never get in that kind of condition. There was evidently something wrong with that woman; she was nicely dressed, and her place was all right, but I couldn't understand how she could ever put her foot inside that factory.

Mr. Aderhold: Perhaps you were a little prejudiced in her favor.

Professor Barr: I certainly thought more of her than I did of her husband.

Mr. Knickerbocker: You said that the factories put up the wages of the inspector? Was that where the patrons or the makers own the factories, or how was that paid?

Professor Barr: In a large number of the factories, at their annual meetings this question was brought before them, and I suppose in quite half of that number, the patrons paid half of it and the maker paid the other half. In a great many cases, the factoryman put it all up, but in a number of meetings this year, I heard the patrons state that they could not invest any money better, and they were quite willing to pay five or ten dollars for that work.

Mr. Everett: I may not be here tomorrow when Professor Barr takes up the subject of cheese making, and if it is not out of order, I would like to ask him what care is taken of the whey at the factory and what value the farmers place upon the whey.

Professor Barr: In probably three-quarters of our factories the whey is returned. In, I think, more than half of those factories the whey tanks are not kept in proper condition, and the whey is taken home in the milk can. In the majority it is elevated by steam and run out into the milk cans. Now in regard to the value they place on that whey. In some cases there is more trouble over the whey than there is over the milk because if they bring a half a can of milk they want a whole can of whey. It would be very hard to say how much money value they put on it, probably they would say all the way from 10 to

15 cents a hundred. I don't think it is worth 15 cents myself, I think 5 to 10 is nearer the figure. It is one of the worst features we have, that returning of the whey, but the patrons want it, and we are doing what we can to give them back that whey in a nice, clean condition. In all of my experience, the best method I ever saw for returning whey was way down in Quebec. We in Ontario rather look upon Quebec as not up-to-date in many things, as we are, but this young Frenchman had galvanized tanks for his whey; it was elevated with a rotary pump and heated up to 160. Those whey vats were washed out as clean as his milk vats every day. And really there is nothing cleaner than whey about the factory if it is properly looked after after it is run out of the vat. This young man pasteurized the whey vats, washed and scalded them every day, and the whey was returned in fine condition, and the quality of his cheese, although not made in quite as good a method as we have, was very nice.

Mr. Mason: Don't you think an ordinary wooden tank steamed every day is all right. It makes what you might call a clean sour. My experience last year really went to show that hogs do better on whey that is a little inclined to be sour than too sweet.

Professor Barr: Yes, hogs in the neighborhood of a hundred pounds will do just as well on whey that is turned a little as on sweet, but younger hogs won't do so well.

A Member: We have a wooden tank in our factory, and we steam it up to about 160 degrees.

Professor Barr: Our whey tanks are all outside in Western Ontario. This whey question is an important one with us. One of our factories this year paid a man $100 for cleaning out the whey tanks, steaming them out thoroughly. I am advocating putting a small cement tank in the ground, so that when you elevate the whey out of the vats it will go into that and from there into another tank, with a pump or ejector, with the tank in the ground and shallow, so you can wash it out easily. Too many of them are five or six feet in the ground, and it is a great deal of trouble to get down in there. If it is shallow you can go there with a pail or two of hot water and clean it out any time; then pump it up into an elevated tank. I do not myself

see any other way of having the whey returned in a proper condition unless it is pasteurized.

Mr. Aderhold: Why should you elevate it at all?

Professor Barr: Because the patrons object to pumping. You see when the tank is elevated above the wagons, they can turn the tap, and it runs into the cans.

Mr. Mason: And they can't turn them back again until their can is full.

Professor Barr: Where you have patrons who are taking home lots of whey, they would be all there at the pump. We have tanks with three-inch outlets so their cans can be quickly filled up. We have also a weigher so the whey can be weighed. It doesn't always work right, but when it does, it does splendid work. The only objection is that it doesn't work quickly enough. I like to have the tank elevated and have it connected with the drain or sewer, so it can be flushed out at any time. If you have everything in nice handy condition, you can keep them clean, but if your conditions are unhandy, making trouble and hard work, they are apt to be neglected.

Adjourned till 7:30 P. M.

Convention met at 7:30 P. M.

Acting-President Powell in the chair.

For the committee on resolutions, Mr. Luchsinger offered the following, which were unanimously adopted:

RESOLUTIONS.

Milwaukee, Wis., January 7, 1904.

The Wisconsin State Cheese Makers' Association:

WHEREAS, The dairy interests of this state are among the greatest sources of its growth and prosperity, and

WHEREAS, It is our plain duty to make the most of the natural conditions so favorable to those great interests, and that in order to hold and increase the eminence we have attained therein our best endeavor should be to bring about a uniform excellence in all our dairy products, therefore, be it

Resolved, That we highly appreciate what the state has done to promote the best methods by its dairy school and its instructors and in-

spectors; that we deem it wise and money well expended to have appointed a sufficient number of strictly competent inspectors so as to insure to each cheese factory and creamery in the state the great benefits resulting from imparting to them the best practical and theoretical knowledge of their business.

Resolved, That we are in favor of legislation insuring to the people of this state, fair and just rates of freight for our products to the markets of the country.

Resolved, That the hearty congratulations of the Wisconsin Cheese Makers' Association be extended to U. S. Baer on his appointment as Assistant Dairy and Food Commissioner of Wisconsin. The selection is an eloquent tribute to the fitness of Mr. Baer, whose great services in the advancement of the dairy interests of Wisconsin are thus recognized. The Wisconsin Cheese Makers' Association is gratified that one of its ablest members should receive such an honorable position. The Governor and the State Dairy and Food Commissioner are to be congratulated on the acquisition of such an able gentleman to their executive force.

Be it further resolved, That copies of this resolution be sent to Governor R. M. La Follette and Commissioner J. Q. Emery.

Resolved, That we are in favor of all laws regulating, restricting, and preventing the manufacture and sale of spurious, adulterated, or unwholesome foods. That, however, we do not class butter made from whey and sold as such as being other than a natural product, and we believe that the same should in no way be classed and taxed as a fraudulent, spurious or adulterated product.

WHEREAS, The early spring and winter work of the dairy instructors in 1903 greatly aided the cheese makers and cheese industry in general, therefore, be it

Resolved, That the Dairymen's Association be requested to send its dairy instructors to their work so early in this season as to enable them to attend the various factory meetings.

Resolved, That we, the members of the Wisconsin Cheese Makers' Association, realizing the necessity of having a first-class cheese instructor to take the place of Mr. J. B. McCready, resigned, we would most earnestly recommend and ask the appointment of Mr. J. D. Cannon of New London, Wisconsin, to fill that position, believing there is no one in the state as well qualified for cheese instructor.

Resolved, That we tender our sincere thanks to the citizens of Milwaukee for the kind invitation, welcome and cordial reception extended to this association, and thank the proprietors of the Republican Hotel in particular for their generous hospitality.

Resolved, That we appreciate the great and continuous efforts of our Secretary, U. S. Baer, and all of the officers and committees of this association in their work to make the splendid success this meeting promises to be, and we heartily thank each and every one of those who in true fraternal spirit, by address, by discussion, and by counsel, have contributed so much to our instruction and entertainment.

Resolved, That this association hereby tenders its sincere and respectful sympathy to Mrs. Cassie H. Johnston, widow of the late president, Thomas J. Johnston, of this Association, whose untimely and unexpected death we all deeply deplore.

Resolved further, That we hereby express our sorrow for the death of our former president, William C. Dixon, who, as president for four years, was a faithful, untiring worker for the good and advancement of this his beloved Association.

JOHN LUCHSINGER, Chairman,
J. F. BACHMAN,
F. J. BENDER,
Committee.

On motion of Mr. McKinnon, a vote of thanks was tendered to the committee on resolutions for the able manner in which they had performed their duty.

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 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	Charles Fischer	Shiocton	Wis	43½	28	15	9	95½
2	A. F. Pasch	Green Bay	Wis	40	27	15	7	89
3	J. A. Schaefer	Prairie Farm	Wis	39	27	15	7	88
4	J. Lehnpen	Cheney	Minn	41	25	13	9½	88½
5	W. J. Elling	Dana	Iowa	33	29	15	9	77
6	J. F. Bachmann	Black Creek	Wis	40	28	15	9½	92½
7	John Kelossener	Dennison	Minn	40	21	14	8½	83½
8	Jac. C. Martinson	Menominee	Wis	38	24	15	8	87
9	A. W. Parkin	Stanton	Minn	38½	23	15	9½	86
10	C. P. Kreuger	Black Creek	Wis	39	27½	14	8½	89
11	Matthew DeHann	Lineville	Iowa	39½	26	15	9½	90
12	Pat Wallace	Hortonville	Wis	42	30	15	9½	96½
13	Aug. Brundt	Forestville	Wis	41¾	27	13	9	90¾
14	Nic J. Schanen	Lake Church	Wis	38¾	28½	15	8½	90¼
15	John H. Hoeppner	Marion	Wis	41½	29	14½	9½	94½
16	Chas Gartmann	Sheboygan	Wis	40	26¾	15	8½	89¾
17	Otto A. Kielsmeier	Hika	Wis	42	28¾	13	9½	93¼
18	Willie Vogt	Louis Corners	Wis	36	23	15	9½	83½
19	P. H. Casper	Clintonville	Wis	42½	28½	15	9¾	95¾
20	Con Creamery Co.	Topeka	Kas	33	24	15	10	82
21	M. DeHann	Lineville	Iowa	39	24	15	8	86
22	H. Anderson	Sheboygan Falls	Wis	40½	25½	15	9½	90½
23	Edgar Lepley	West Lima	Wis	42¾	29	15	10	96¾
24	John Vogt	Orihula	Wis	42¾	28½	15	10	96¼
25	M. Michels	Garnet	Wis	40½	27	15	9½	92
26	Walter Fero	Stanley	Wis	41½	29	15	9	93½
27	Miss M. A. Raeder	Milladore	Wis	40½	28½	15	9½	93½
28	Joe Vogt	Orihula	Wis	42	26¼	15	10	93¼
29	Otto Freund	Hayton	Wis	38½	24	15	9¾	86¾
30	John Clarson	Boscobel	Wis	41	29	15	9	94
31	J. R. Biddulph	Providence	Ill	43	27	15	9½	94½

Brick Cheese.

No. of entry.	Name of Exhibitor.	Post Office.	State.	Flavor. 40	Texture. 30	Color. 15	Make-up 15	Total. 100
1	B. Jonley	Brownsville	Wis	39	29	14½	15	97½
2	Max P. E. Radloff	Hustisford	Wis	38	29	14	14	95
3	J. Rothenbach	Orfordville	Wis	39½	30	15	14½	99
4	R. C. Ganshow	Bondue	Wis	39	29	15	11	94
5	Jac. Rezez	Monroe	Wis	38½	28	15	15	96½
6	J. & M. Steiner	Milwaukee	Wis	35	25	13	15	88
7	H. B. Stanz	Milwaukee	Wis	39½	29	15	14½	98

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	Max P. E. Radloff	Hustisford.	Wis .	15	13	10	8	8	5	59
2	Ed Wittwer & Bro..	Monticello.	Wis ..	25	20	19	9	7	5	85
3	Alex Schaller	Mt. Horeb	Wis ..	28	21	18	9	9	5	90
4	Fred Held.....	Mt. Horeb	Wis ..	25	23	18	9	8	4	87
5	Jacob Erb..... ...	Mt. Horeb.	Wis ..	29	20	20	10	9	4	92
6	Jacob Marty	Broadhead.	Wis .	29	24	19	10	10	5	97

Limburger Cheese.

No. of entry.	Name of Exhibitor.	Post Office.	State.	Flavor. 40	Texture 30	Color. 15	Make-up 15	Total. 100
1	Jacob Regez	Monroe	Wis	39	30	15	13	97
2	Wittwer Bros.....	Monticello.....	Wis	35	25	12	10	85

Flat Cheese—Complimentary Score.

No. of entry.	Name of Exhibitor.	Post Office.	State.	Flavor. 40	Texture. 30	Color. 15	Make-up 15	Total. 100
1	J. W. Cross	Mauston	Wis	42	24½	15	9	90½
2	J. W. Cross	Mauston	Wis	31½	20	15	8	70½

Edward Lepley, West Lima, Wis., won first premium, gold medal, on Cheddar cheese.

J. Rothenbach, Orfordville, Wis., won first premium, gold medal, on Brick cheese.

Jacob Marty, Brodhead, Wis., won first premium, gold medal, on Swiss cheese.

Pat Wallace, Hortonville, Wis., won second premium, silver medal, on Cheddar cheese.

H. B. Stanz, Milwaukee, Wis., won second premium, silver medal, on Brick cheese.

Jacob Erb, Mt. Horeb, Wis., won second premium, silver medal, on Swiss cheese.

John Vogt, Orihula, Wis., won third premium, bronze medal, on Cheddar cheese.

B. Jonley, Brownsville, Wis., won third premium, bronze medal, on Brick cheese.

Alex. Schaller, Mt. Horeb, 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,

R. A. Horton, Fond du Lac, Wis.,
S. E. Knickerbocker, Wyoming Wis.,
John Luchsinger, Monroe, Wis.,
J. T. Steiner, Milwaukee, Wis.,
Judges.

J. W. Cross, Mauston, Wis.,
Superintendent.

E. L. Aderhold, Neenah, Wis.,
Critic.

Mr. Luchsinger: Being one of the judges on foreign makes of cheese, I would like to make a little statement now. The two exhibits of Limburger cheese, which have been exhibited here, are about the finest of the kind that I have ever seen or tasted. If all Limburger cheese were made as well as that and could be kept in about that condition until it reached the consumer, there would be a much larger quantity of it eaten than there is at present. Limburger cheese, properly made, is one of the best cheese for the digestion that can be eaten, and I

think some doctors even claim that it is good for dyspepsia, because it is partially digested already.

The one exhibit of brick cheese is a wonderfully good exhibit. the brick cheese is a conveinent shape and size to use in the family; it can be cut without much trouble and is a favorite with dealers on that account, because it does not dry out. Our makers seem to have gotten onto the best way of making that kind of cheese.

Swiss cheese is a little of a lottery; a good deal depends on the conditions under which the cheese is kept after it is made. Two at least of the cheese on exhibition which have received the highest score are excellent for their kind, and I am inclined to think that with a couple of months more they would be equal to any imported cheese that you have ever seen or tasted. The trouble with our Swiss cheese in this country has always been that we cannot wait long enough before putting it on the market, and it is shipped off when it is hardly fit to eat, before it is really palatable. It is only when that cheese gets to be six or eight or ten months old that it reaches its best condition, and some of us think even longer. There are some very fine specimens of cheese down in the exhibition rooms.

REPORT OF SECRETARY, U. S. BAER, MADISON, WISCONSIN.

Mr. President and Members of the Association: I have the honor to report upon the work of this office for the year ending January 6, 1904.

In the absence of the Treasurer, Mr. J. B. McCready, I beg to submit the following condensed financial statement for the association year just ended:

Total receipts	$1,599.52
Total disbursements	1,231.04
Balance in treasury	$368.48

Two hundred dollars of these receipts are in the form of borrowed money not yet due. Deducting the amount of this obligation a balance of $168.48 over and above all indebtedness remains in the treasury of this association.

Itemized accounts of the receipts and expenditures for the association year are given in the Secretary's books. In the books of Treasurer J. B. McCready an 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 and President which he holds as vouchers. These books are open for inspection at any time by any member of the association.

The future outlook for the continued success of the organization was never as encouraging as at the present time. Through the liberality of the last state legislature the association's state appropriation of $400 annually was increased to $600. The membership for the past year has increased nearly one-third over that of the preceding year.

In conclusion I desire to express my high appreciation and heartfelt thanks for the confidence reposed in me for the several years I have served as your Secretary.

REPORT OF BOARD OF DIRECTORS.

Gentlemen: A meeting of the directors and officers of the Wisconsin Cheese Makers' Association was held at the Republican Hotel in the city of Milwaukee on the 9th day of May, 1903.

Present, Directors J. K. Powell, F. J. Karlen, E. L. Aderhold, and Secretary U. S. Baer.

The report of Mr. E. L. Aderhold upon his work before the legislature in behalf of the association's appropriation bill was accepted, and a vote of thanks tendered the gentleman for his services.

Upon the motion of Mr. Aderhold, seconded by Mr. Karlen, the committee appointed Mr. J. K. Powell of Stevens Point,

Wis., acting-President for the remainder of the association year, in the vacancy made through the death of President-elect, Mr. Thomas Johnston of Boaz, Wis.

By a unanimous vote it was decided to hold the twelfth annual convention in the city of Milwaukee, on the 6th, 7th, and 8th days of January, 1904.

The committee instructed Secretary Baer to make all arrangements with reference to securing transportation, hotel headquarters, convention hall, exhibition rooms, etc.

By order of the committee, the rules governing the cheese exhibit were changed, making it imperative for all exhibitors to prepay the transportation charges on all cheese to be entered into competition for medals, diplomas or pro-rata premium.

We have examined the accounts and vouchers of the Secretary and Treasurer and find them correct.

(Signed) J. K. Powell,
E. L. Aderhold.

REPORT OF COMMITTEE ON LEGISLATION.

Mr. McKinnon: I wrote out a set of resolutions and had them adopted by our board of trade at Sheboygan Falls, and a copy of the same was laid on the desk of every member of our legislature.

Mr. Aderhold: As a member of that committee I will say that along when the session of the legislature was nearing its close, some of the directors, and I believe, Mr. Baer, urged me to go before the proper committees and plead the case of the association, and I made arrangements to meet the two committees, the committee on dairy and food and the joint committee on claims. Professor Emery was of very great assistance to me in giving me pointers and preparing the committees for what was coming. I talked with the first committee about twenty minutes. We asked for about a thousand dollars increase, but we expected they would cut down the figures, and we were not disappointed. The first committee allowed us an increase of $200. Then I went before that august body, the

joint committee on claims, who had agreed to give me twenty minutes time, and they were totally tired out listening to the arguments of various sorts for appropriations, and after I had talked a little while the chairman broke in and said, "Will you be satisfied with $200?" I said, "Well, we can use more, but that is better than nothing," so I got that $200 for quitting, really.

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

ELECTION OF OFFICERS.

The convention proceeded to the election of officers for the ensuing year.

Nominations for President were first called for and the following named gentlemen placed in nomination: E. L. Aderhold, J. K. Powell, and S. E. Knickerbocker.

A. J. Martin and Mr. Murray were appointed as tellers, and the ballot was taken, resulting as follows:

Powell	31
Aderhold	23
Knickerbocker	11
	65

There being no majority, another ballot was taken. Mr. Knickerbocker requested that his name be withdrawn.

The ballot resulted as follows::

Powell	41
Aderhold	26
Knickerbocker	1
	68

Mr. J. K. Powell having received a majority of the votes, Mr. H. J. Noyes moved that this informal ballot be declared formal, and that Mr. J. K. Powell be declared elected.

Motion seconded and carried unanimously and Mr. J. K. Powell declared the duly elected President of the Association for the ensuing year.

Mr. Powell: Gentlemen of the convention, it may seem a little presumptuous in me to accept of this office again. I held the office under adverse circumstances, when there was nothing in it but work and expense, and as this is about the first time in our history when we can go to work and carry on a convention as it should be carried on, I am pleased to try it once more. I have not solicited this in any way, shape or manner, but I am proud to be elected again, and to serve you and shall do so to the best of my ability. I promise you that I will not come before you next year for election to any office whatever, nor at any time in the future history of this convention, unless something should happen to it when it would seem that I could do it some good.

Thanking you for your votes, I am yours to serve for this year.

Nominations for Vice-President were called for and the following were placed in nomination: Mr. S. E. Knickerbocker, Mr. Waterstreet, and Mr. Aderhold.

The nominations being closed, a ballot was taken resulting as follows:

Aderhold	37
Waterstreet	14
Knickerbocker	3
Total votes cast	54

Mr. Aderhold having received the majority of all the votes cast was declared the duly elected Vice-President of the association for the ensuing year.

Nominations for Secretary were next called for.

On motion of Mr. Noyes, duly seconded, the rules were suspended, and the President instructed to cast the ballot of the association for Mr. U. S. Baer as Secretary, which was done,

and Mr. U. S. Baer declared the duly elected Secretary of the association for the ensuing year.

Nominations for Treasurer were next called for. Mr. Matt Michels was nominated by Mr. Knickerbocker; motion duly seconded. On motion of Mr. Noyes, the President was instructed to cast the unanimous vote of the association for Mr. Michels as Treasurer, which was done, and Mr. Michels declared the duly elected Treasurer of the association for the ensuing year.

Nominations for Director to serve for three years in place of Fred J. Karlen of Monroe were called for.

President Powell tendered his resignation as a member of the Board of Directors, which, on motion of Mr. Noyes, was accepted.

Mr. Karlen of Monroe was nominated as Director for three years. There being no other nomination, on motion of Mr. Noyes the President was instructed to cast the unanimous ballot of the association for Mr. Karlen for three years, which was done, and Mr. Karlen of Monroe declared the duly elected Director of the association for three years.

Nominations were next called for for Director for one year to fill the unexpired term of J. K. Powell, resigned. J. F. Bachmann was nominated. On motion of Mr. Knickerbocker, duly seconded, the President was directed to cast the vote of the association for Mr. Bachmann and Mr. Bachmann was declared the duly elected Director of the association for one year.

Adjourned till 9 A. M. next day.

January 8th, 1904, 9 A. M.

Convention met pursuant to adjournment.

President Powell in the chair.

CHEESE MAKING IN ONTARIO.

PROFESSOR G. H. BARR, STRATHROY, CANADA.

Our aim as Canadian cheesemakers is to manufacture an article which is second to none. To do this means eternal vigilance and close attention to details in all our work. The system of making the cheese is well known, so that I need not go into the routine of making, but rather I will try briefly to give some of the details or changes we have adopted, which we find are helping to improve the quality of our cheese.

We are paying more attention to the use of a pure lactic acid culture, endeavoring to get sweeter milk delivered at the factories and introduce the pure lactic acid germ, so that the flavor of the cheese may be finer and more uniform. Some of our best makers have been able to carry the same culture for five years using it nearly every day in the cheese making season, and carrying it through the winter while making butter. The latest addition to our equipment for making cheese is the acidimeter. This is a process of estimating the percentage acidity of milk and its products by means of an alkaline solution, and may be described as follows:—

The necessary quantity of milk or whey (10 C. C. is convenient) being measured and mixed with about the same quantity of distilled or rain water, an indicator is added (3 or 4 drops of phenolphthalein). Standard alkaline solution is then cautiously added from a burette, till the change of color comes. The alkaline solution we are using is of such a strength that I. C. C. of this solution will exactly neutralize .01 of a gram of lactic acid. Therefore the percentage acidity (if 10 C. C. of milk is used) can be read direct by noting the number of C. C. of alkaline solution required to bring about the permanent change in color.

Suppose 10 C. C. of milk are placed in a beaker, the proper indicator used, and the standard alkaline solution added until the color of contents of beaker changes, we read the burette, and find that 2 C. C. of alkaline solution have been used, the acidity of such milk would be .2, why, because 1 C. C. of alkaline solu-

tion represents .01 of a gram of lactic acid, therefore 2 C. C. of this solution would represent .02 of a gram of lactic acid. Now 10 C. C. contained .02 of a gram of acid, therefore 100 C. C. of milk would contain .2 of a gram of lactic acid.

The use of the acidimeter in making cheese in Ontario is quite recent, but it is proving so valuable that many of our best makers would not go without it. We have found that milk is ready for setting when it shows from .19 to .22, varying in different factories and sections. For setting it is not any more accurate than the rennet test is, if properly made. We find it very valuable in assisting to cook the curd properly. Before we got the acidimeter, we had no way of testing the acidity of the curd after cutting, until it was partly cooked or firm enough to squeeze in the hand, to try on the iron. With the acidimeter a test can be made five minutes after cutting the curd, and cooking can be done more scientifically and cheese of a more uniform quality and smoother texture can be made. For instance: If milk was set with .2 acidity, and the whey immediately is .15, cooking should be done slowly or in a normal way, taking about 1½ hours from time of setting until the temperature reaches 98 degrees, but if for some reason the whey tested .17 immediately after cutting, then cooking would be hastened, why? because the lactic acid develops largely in the moisture inside the cubes of curd, and by contracting the curd rapidly the moisture is expelled and developments of acid retarded, on the other hand if the temperature is raised slowly, and the curd handled carefully, the acid will develop more quickly. The result is this. Milk can be set sweeter, and by careful cooking, the curd will dip in the usual time 2¾ to 3 hours, and will make a cheese with that smooth silky texture that is so much desired.

This point is the most valuable we have adopted in years. I would recommend using power agitators for stirring curd while cooking. You will observe the acidity of whey immediately after cutting the curd is very much less than it was in the milk. This is largely due to the caseine nearly all being retained in curd. When the acidity of the whey reaches the same point as the milk had at setting, or .01 less, the whey is usually ready to dip or draw off the whey. If half or more of the whey has been removed some time before dipping time, .01 to .02

more acid should be given on the whey before dipping curd. Dipping the curd and getting the proper amount of moisture left in it is one of the most difficult points in all of the process of making cheese, and I hope that before long some of our scientific men will discover some means of determining the amount of moisture in curd in a simple way. We are finding that the drier the curd is stirred at this stage, dipping, the more meaty the cheese are and they are also closer bodied. By stirring dry and using less salt we are making finer cheese than when more moisture was left in the curd, and more salt used. After dipping, the curd is allowed to mat and then broken over loosely, allowed to mat again before cutting into strips about six inches wide, piled two deep and turned often enough to prevent the whey from collecting on the curd. By testing the whey that is running from the curd, the milling point can be determined very much more accurately with the acidimeter than with the hot iron, when it shows from .75 to .80 per cent. of acid the curd is usually ready to mill, and should be kept stirred after milling so that it will not mat together. When the whey running from the curd shows 1.1 to 1.3 per cent. of acid it should be well aired and salted. It is important that particular pains be taken to get good body and flavor in the curd before salting, and putting it in the hoops. To get the highest price, the cheese must be nicely finished and clean, no collars—or crooked seams. The curing of cheese has received a great deal of attention during the last two years, and curing rooms are being built so that the temperature scarcely gets above 65 degrees. This we are finding gives a much smoother texture and better flavor in our cheese than the old 75 or 90 degree curing rooms did.

DISCUSSION.

Professor Barr: I want to say that after the boys got onto the way of using this apparatus, one or two of them have come to me and said that if they had to work without it, they would quit making cheese, it has been such a help to them. To use

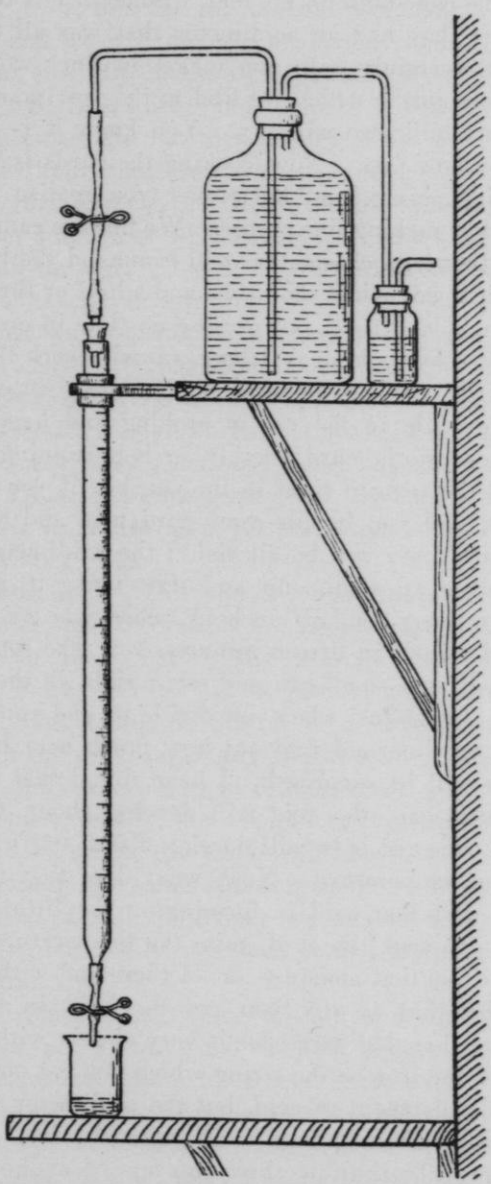
it properly and get the best results, you have got to have your curds well cooked and stir them dry.

A Member: Where can we secure this apparatus?

Professor Barr: You make this acidimeter yourself. It might be all right to send over there and get a sample, but you don't want to pay any duty on a thing like that. It costs almost nothing. We adopted the method and got up our own apparatus. Dr. Lloyd, an English chemist, has written a very good work on it. You can easily make it yourself. We got up dozens of them last year in the dairy school, helping the students to make them. We bought the small glass tubing and got the students to bend them. All the whole thing costs by having them made up is $3.50. You can make them anywhere that you can get a spirit lamp or something to bend the tubing. Any kind of a bottle with a rubber cork will do. Get the neck large enough to put in about an inch rubber cork with holes cut through to put the tubing through into the bottle. We get all our burettes from New York through Hyman & Hamlin. You must have a ten-CC. pipette and a ten-CC. burette and this bottle may be a gallon, or anything you like. Then your chemist can make the solution for you. I have here an illustrated bulletin, which you can put in your report, if you like, though I just as soon not have this printed matter go in, because it was issued a year ago when we didn't know so much about it as we do now. Any chemist can make up the solution if he is careful, so that one CC. of the solution will exactly neutralize .01 of a gram of lactic acid. Then you have the solution of the proper strength and then by using the ten CC. pipette, you can read the figures directly.

Mr. Michaels: Do you use the acidimeter alone, or do you use the hot iron in connection with it?

Professor Barr: In introducing this test we have the makers use the hot iron with it, until they feel that they are able to handle this alone. During the fall, after the instructors' visits to the factories all summer, we find that a great many makers have discarded the iron altogether, and some factories have never used the iron at all, only just to see how it is going, to compare the work, but I would advise using the iron with it, until you know that everything is going right. You want to be like the child who is learning to walk; he doesn't let go the chair



Acidimeter used in making cheese in Ontaria.

till he is sure he can stand on his feet. Some of our boys seem to think that if they had an acidimeter that was all they had to do. It will certainly help you to get in finer work, especially in cooking curds, which we find is the best point. You have rather fast milk, we will say. You know it is fast, but you don't know how fast. Now, cooking the curds is the main thing in making cheese, and the sooner you realize that, the sooner you will be making fine cheese. We find we cannot make a nice cheese, that is, a cheese that will command the best price for export, unless we cook it about two and a half or three hours. That may seem a long time, but we lose no time in our method of making cheese by cooking that long, we will work that much faster afterwards. What we want is that nice, smooth, silky texture that is made in the vat in cooking and handling the curd, and if you use the curd roughly, or it is running too fast, then you spoil the texture right in the vat, but if you have the milk set right, and you handle your curd nice and even, and cook it gradually, you will be all right; the acidimeter taught us this. You get an acidimeter and start using it, and after you cut the curd, say for half an hour, when you get the curd started around a little in fifteen minutes, you take some of the whey and put it in a small can and set it right in the vat and take a sample of that just when you divide it, and you test that whey at dipping time and find out how much acid has developed, and you will be surprised. I have found that the whey put in this little can, the acid will develop about .01, while the whey that the curd is in will develop about .05 in the same time, the same temperature. Now, what does that teach us? It teaches us that that acid is forming in the little cubes of curds, and as you cook the curd, raise the temperature, and by raking it you expel that moisture out of there and with it comes the acidity, and that is why you get the acid in the whey. Now, we found that that corresponds very closely with the acid that you get on the iron or the string which you get on the iron. It shows the development of acid, but the acidimeter will show that immediately after cutting, while with the iron you have to run it on probably half to three-quarters of an hour before you can tell where you are. At the school last winter, we set a vat very sweet, and I had charge of the experimental class there, the older makers, and they said, "Well, I guess we are here for

all day. Now, this will set in about four hours." I said, "We will see and we will use our acidomter, and see if we cannot make that curd dip in the right time." By cutting it in large cubes, a half inch knife, and turning it over slowly for ten or fifteen minutes, did not turn on any steam for twenty minutes or half an hour, the result was that the acid developed and we had that curd ready to dip in almost the same time as if it had been riper milk, and we had cut the curd finer and heated it quicker all through. You have your mind on that curd all day, you know exactly in a minute where it is and just what it is, and in that way you make a nice, smooth cheese.

Mr. Michaels: What kind of curd mills do you use?

Professor Barr: Our curd mills are nearly all Barnards; it is a nice mill, a small knife. It is a mill that gets out of condition quickly, if it is not kept nicely but it is a good mill. In Western Ontario, we have very few hand mills now. Some of the Harris mills are used yet and I am sorry to say we have one or two peg mills.

Mr. Aderhold: Did you say that the acidimeter was not much better than the rennet test in setting the milk?

Professor Barr: With the average cheesemaker I don't think it is any better. It is just as good provided you are careful. One reason is that it is a little difficult to see the change in the milk, especially if you color it before you test it, and especially where normal milk is made up where the rennet test is made carefully, the results will be all right. I have seen milk that the rennet test came right down, while the acidimeter showed exactly the same, standing at the same point. Of course, in that kind of milk the rennet test was not as good a test as the acidimeter, but one or two cases is all I have seen in two years of that kind.

Mr. Mchaels: Of course, we all know that where the rennet test is not a fair guide is with abnormal milks. Would you consider the acidimeter a good guide with abnormal milks?

Professor Barr: This acidometer wll not show us everything; it will show the acid reaction in the milk, but we all know that in cheesemaking, the acid salts in the milk have something to do with the development of lactic acid. Professor Gamble says that the larger the amount of acid salts in the milk, the quicker the development of lactic acid will be, and he thinks

that to get down to the fine point, we have got to get something to test the acid salts in the milk. The acidimeter is always an accurate test of the acidity in the liquid, but there are other constituents in milk besides lactic acid that play an important part in making cheese. It is an accurate test, but a very delicate one and has to be used with very great care, and we find that the majority of makers think that if they get it down to only .01 that isn't very much and it doesn't make any difference, but that means a good deal, and you will gradually get to understand that, though at first it seems a very small thing.

Mr. Dewhirst: Do you have any trouble keeping a standard solution of the right strength? That is one of the troubles in Manns' acid test.

Professor Barr: We don't have much trouble with the solution; we have more trouble with the indicator. We simply keep the solution well corked and air-tight, and you can keep it for a year. It is simply distilled water and caustic potash, nothing to go wrong, but if you leave it open, it will weaken very fast. You must also be careful not to leave any solution in your burette over night, clean it out. Great care must be used in using it, but it is worth while, our best men are very much pleased with the acidimeter, and I wouldn't make cheese without it. I would feel at sea if I had to go back to the old method. Cleanliness is absolutely necessary. One of the worst features in our trade is with regard to the cleanliness of our curd sinks, and we try to use this as a lever to get them to get their curd sinks clean.

Mr. Noyes: In handling a curd that is not normal would you work the vat slower before application, or would you use a starter and hurry that curd up?

Professor Barr: If I had any taint at all in the milk, I would use a starter. I believe we have spoiled more cheese in Ontario by using a starter than by using any other thing we ever tried, but because a thing has been abused, I don't see why we should condemn it, if it is a good thing. Now this past season we have had more poor lactic acid cultures used than we ever had, and in districts where we are bothered somewhat with flavors, they have been so successful in using them that you could not buy them. One man told me this fall he wouldn't take $25 for his starter, because it has been such a help to him.

I believe in using the culture—you will pardon me for saying culture,—Professor Dean pulls us up for saying starter; he says culture is the right word for it, but they both mean the same thing. But we find this, that where the starter is being made right from pasteurized milk with the proper mother culture introduced, we are having less trouble getting a close cheese and we are getting through quicker and the cheese are more uniform. Now, when you get those three things, you keep the maker in better temper and he will do better work and you keep the buyer in a better humor and he will give you better prices, but if you use a starter, be sure that you have the right kind of a starter. I have put a starter into vats this summer simply to show the uselessness of having such a one. I went to a factory where they had a starter and I tested the acidity at one per cent. I said, "We will put that in today and see what it will do, my opinion is that it will do no more good than if you put in two pailfuls of water." They couldn't believe that. We put in two pailfuls of this starter in each vat, and that milk lay there for two and a half hours, scarcely developing—you could just see it coming, but it took two hours and a half to develop about four seconds, and it showed the uselessness of having a poor starter. Where you have the right kind of a starter, and introduce a very small amount of it early in the day, use less starter, but use it so that it will work longer, you will get a nicer cheese. You will not have that tendency to acidity in the cheese that you will by letting the milk run on longer and then pour in a lot of starter; that is poor policy. I have seen cheese that did not have too much acid any time during the day, but those cheese were acid in the curing room simply because there had been too much starter used, and you have not seen the effects of it when you were making it up. It would develop afterwards and you have a rough texture, a mealy cheese. You must have pure culture. We have factories where they use that every day in the year, but they always have their milk delivered sweet. I would not use more than one per cent. at a time. I think if you have to use more than that, you are either not putting it in at the right time, or you are not using the right culture. I would never add the culture until the milk was heated to 60 degrees, never put it into cold milk. If you are going to run a starter, you have got to realize

that you are handling germ life, and you have got to have that germ life in the most vigorous condition, and if you put those germs into a cold vat, you will paralyze them to a certain extent and it will take just so long for them to recover themselves and come back. We have got to recognize these bugs and germs that are useful to us—of course some are not—but if you put your lactic acid germ into a cold vat at say 45 to 50, you will paralyze them, but if it is 60 to 65, it will go right on. Of course, milk coming in the summer would not usually come in under 60. But do not put it in the morning if it comes in at 70. That is one good thing about the acidimeter, the temperature of the milk doesn't make any difference for testing the acid, so long as it is not frozen. You can take a pipette full and make the test any time and you know exacty where you are. With the rennet test you have to heat the milk up to a certain point.

Mr. Aderhold: Wouldn't you use more than one per cent. starter if you had very badly tainted milk?

Professor Barr: No, I don't think it is a good policy. There is too much danger of developing an acidy texture afterwards.

Mr. Waterstreet: In the fall of the year, when the milk is very sweet, couldn't you use more than one per cent. of starter then?

Professor Barr: By putting it in early in the morning, providing you knew your milk was very sweet. If I had three vats I would put a thousand pounds in a vat and heat it up to 60 or 65 or 70, and then put in the culture. If your culture is introduced early, it has a chance to work. Put it up to 86, if you like. You will have better results than if you put in a whole lot.

Mr. Van Leeuwen: How long do you want your vat to set before you draw the whey? How much acidity do you develop when you draw the whey, and how much dry acid do you develop before you mill your curd in normal working milk?

Professor Barr: Well, if I were using power agitators I would want that curd to stay in the whey from the setting until I drew the whey off, or dipped it, three hours. If I were using a rake two and three quarters or a little less might be enough.

If you leave the curd three hours, you get it too dry or too shotty, and it will likely work slow.

Mr. Van Leeuwen: Then you would not consider the agitator a good thing to depend upon entirely in stirring a fast-working milk?

Professor Barr: No.

Mr. Van Leeuwen: If we have the agitator, can we stir by hand in connection with it, or will the agitator catch us?

Professor Barr: You can do a certain amount of hand stirring but here is the advantage of the agitator. As soon as you have your curd cut, you can start the agitator and you can do some other work, while otherwise at that particular time, you have to attend to that exclusively. The agitator will keep the curd stirred better than any man I know. Then as soon as you get it cooked, to the cooking temperature, take out the agitator and use your rake, and then wou will get your curd firmed up very quickly. We never depend on the agitator doing all the work, always take them out when we get the acid developed on the iron, and use the rake.

Mr. Van Leeuwen: Is the rake better than stirring by hand?

Professor Barr: I prefer to use the rake, it is easier on the back and you never catch me doing any more work than I have to. If I can make the engine do the work, I will save Barr as much as I can. There is at this point a good deal of variation among our men. I will tell you what I believe, if a man can make cheese with one-eighth of an inch of acidity at dipping, he is a better man than the man who has to have a quarter, and the man who can make with one-sixteenth of an inch is a better man than the man who has to have an eighth. He shows more ability, more care, more scientific work—I have found that out. You get a careless fellow, and he has to have a large amount of acidity to get through, but you take a careful man, a close-watching man, he can work that curd through with half the acid on, simply because he knows his business and he gives it every chance to develop at exactly the right stage, while the other man has to have a big acid on to work. If you are using half an inch you are not as good a man as you ought to be. Work it down. Work it down. The man that is working on an eighth of an inch is working on finer lines than the man who

has to have a half. Dip with just as small an amount of acid as you can to work it through and get it through in nice time. I know there are times when I can string one inch and do my best and another man will string it two with the same piece of curd, and that is just where we are at sea, and the same way in pulling the acid at dipping. I remember a case last summer where a maker said he had half an inch, the man went out and tried and he had an inch. Now, do my best, I couldn't get more than a quarter on the same curd out of the same vat and those fellows were both honest.

A Member: At what time do you try the dry acid? Just before milling?

Professor Barr: Yes, when you are using the iron, you have to keep trying it every fifteen minutes or so after dipping.

A Member: Don't you occasionally find curds that won't show acid at that time?

Professor Barr: Yes, that used to give us a good deal of trouble until we started using the alkaline test, because we didn't know where we were. We usually find these curds, when you can't get the acid on the iron, they have too much. I would rather mill the curds without the iron myself than with it. I think I can tell more about the condition of the curd than with the iron.

Mr. Van Leeuwen: Suppose you have a curd that has required from two and a quarter to three hours to develop the one-eighth of an inch acid. About how long then after drawing off the whey would you be able to have an inch and a quarter to an inch and a half of acid?

Professor Barr: An hour and a half to two hours. In about an hour and a half we like to have it show an inch.

Mr. Van Leeuwen: Our Kansas fellows are as independent as a hog on ice, they don't care whether we take their milk or not. They say, "We can raise corn and wheat and we don't have to milk cows and we won't do it if you don't like the way we bring the milk." Of course we are just starting in there and trying to educate them to the point of seeing that it is to their interest to bring us good milk, but we do have vats of milk come in in such condition that in one hour from the time that we set it, we will have from an eighth to a quarter of an inch of acid without using any starter. I have had them work in thirty-

five minutes. Now, what are you going to do with milk like that?

Professor Barr: Do you ever use water?

Mr. Van Leeuwen: Oh, yes, I have used water, did the best I could.

Professor Barr: You can't make fancy cheese out of milk of that kind.

Mr. Van Leeuwen: I use a little more rennet, set it at a little lower temperature, cut it very fine, and keep cutting and stirring and removing the whey, getting it off as rapidly as possible, then allow it to mat, and of course it doesn't take very long until it develops an inch of acid and is ready to go to milling.

Professor Barr: We have been spending too much time over such over-ripe milk, gentlemen. We have been trying to make cheese out of that kind of milk too long. At least, in the older districts, we ought to take less time discussing over-ripe milk and spend that time on the farmer and make him do a little of the worrying. To handle this over-ripe milk, if you follow out the idea of cooking properly, you will cut the curd just as fine as you can. In the first place, you will use more extract, because that will help expel the moisture; set at a lower temperature and you will get your extract stirred in. Then cut it fine and cook as quick as you can. We find this, that when you get the whey nearly all removed, have, say, six inches of whey in the bottom of the vat, the curd just nicely covered, now, by raising the temperature a degree or two and keeping that curd stirred in the whey, you will find the acid will not develop as quickly as if you tried to take all the whey off. You will gain time, you will make a better cheese if you keep that curd stirred in the whey than if you remove all the whey and let it lay too long. You think it will develop quicker in the whey, but it does not. Then you have your curd in better condition and will make a nicer cheese than if you threw it out in a soft condition.

A Member: Wouldn't it be a good idea to put in water?

Professor Barr: With a very, very ripe curd, the water will overcome that quicker than anything else. If you have water handy, run it into the vat and cook your curd. You will wash the acid out.

Question: At what stage would you run that water in, and what temperature?

Professor Barr: I would like to add it to the curd at about the same temperature as the curd.

A Member: In the start, if you knew you had a gassy curd, wouldn't you give that a little more acid in the whey?

Professor Barr: Well, if I knew the milk was gassy, I would rather give it the acid in the milk, and then run it along in about normal conditions. I would rather cook it in such a way that I would have the curd dipped in such conditions that the acid would develop quick enough after I removed the whey to come along in about normal condition. The first thing you want to do is to cut the curd coarse, cook it slowly. You have acid in the cubes of curd, then when you take the whey off that curd, to drain it, you have the acid in the very best condition for development, you have it inside the curd. You don't need to get any more acid, if you have the curd in condition when you dip it.

Mr. Aderhold: We have had lots of trouble with the acid stopping almost completely and for that reason in the case of abnormal milk, wouldn't you give it a little more acid at dipping if it was tainted, at some time before setting, or some time after before dipping? It is hard to get enough to dip with.

Mr. Alvis: Wouldn't a good starter stop that checking of the acid?

Mr. Aderhold: I have seen it checked sometimes with a good starter, but there is a point, there are a lot of cheese makers that do not make a good culture or starter. They say it is too much trouble, but I find that the men who have the most trouble are those who are not using a good starter. A good starter helps over those circumstances better than anything else I know of.

Mr. Alvis: Professor, suppose you have a quick-working curd and run it up to about 108. You have to get the right cook, we all know that. Now, I find that when you have it at that point and run on cold water and reduce it to 100, you can get it on the racks in better condition and have better drainage of the curd. What is there in that?

Professor Barr: I never used cold water myself. If I were using water, I would probably put it right in the vat. Run off

all the whey, put it in the vat and you can check the curd back just as far as you like by doing that.

Mr. Aderhold: I think Mr. Alvis meant in case he had to cook very high, say 108, to reduce it to 100 by using water, he meant in the cooking.

Professor Barr: If you have a temperature of 108 and you attempt to draw the whey off of that, you will find your curd will mat very quickly and the advantage of using the cold water is you get the curd in a better condition to start the moisture out.

Mr. Alvis: So you really think, on a quick-working curd, it is advisable to cook a little high.

Professor Barr: If you can keep the particles apart; don't let it mat.

Mr. Van Leeuwen: At what temperature do you cook your normal working curds, how high would you say would be all right?

Professor Barr: Ninety-eight to 100 is our temperature for normal milk For fast-working milk, the only time I would recommend cooking higher would be to run off all the whey and then raise the temperature. We have brought it to 110, but I don't like it. We find about 103 or 104, and stirring it in the whey until it gets firm will give us the nicest cheese.

Mr. Wallace: I have found factories that usually cook normal milk at 98 or 100 and the same factory has to go to 106 or 108 at times.

Professor Barr: I never found that variation in Ontario. We have had more trouble this year than we ever had before in getting firm curds.

Mr. Wallace: I have had that trouble, and factories not a mile away have had nothing of the kind.

Professor Barr: I would cook at such a temperature that your curd would be nice and firm before dipping.

Mr. Aderhold: How high did you have to cook this year, Mr. Wallace?

Mr. Wallace: Not less than 106 at any time, and sometimes to 116.

Mr. Aderhold: I found one factory that cooked at 116 several months and cut the curd very fine, and it was at that temperature for at least two hours, and he would take a handful

and squeeze it and the white whey would run right out of it. I found another factory that was cooking at 114.

Mr. Wallace: Was the yield hurt a great deal?

Mr. Aderhold: Of course it was hurt some, but I don't know how much.

Mr. Alvis: Did these factories trade thermometers?

Mr. Aderhold: This was not in the thermometer, it was in the condition of the milk.

Mr. Michaels: An operator down our way had his thermometer tested, and he claimed it went to 48 below zero; I thought something of that kind might be the trouble.

Mr. Van Leeuwen: I supposed I was the only fellow that was having that trouble; I thought it was some freak out in Kansas. We had to cook extremely high, and I didn't know and don't know what was the cause, and I would like to know.

Mr. Aderhold: So would I.

Mr. McCready: I know of lots of them that cooked as high as 115. Speaking of the checking of the acid, I want to ask Professor Barr if that high cooking hasn't something to do with the checking of the acid.

Professor Barr: If the curd is in a soft condition, I can scarcely see why it would check the acid. If the curd had got hard, then I think it would check it very much. I don't know what kind of cows you must have out here.

Mr. Aderhold: Professor Barr, we have milks once in awhile where the rennet will not work on it, or it does not coagulate as fast as it ought to. What do you suppose is the cause of that?

Professor Barr: I wish some of you would tell me that. We have—not very many cases of that kind, but a year ago last summer I had it in one factory, and I had the milk analyzed and apparently it was in normal condition, and still we had to use five and five and a half ounces, and I took some of that extract from that factory to the next factory and two and three-quarters ounces would set the vat in about twenty-five minutes, the same extract. I was not able to locate any cause for it during the whole season.

Mr. Aderhold: Would that 5½ ounce cheese be a quick-curing cheese?

Professor Barr: His cheese did not hold the flavor as well

as it should, because the curd was always in a rather soft condition all the way through, and his cheese didn't have the body and the flavor they should have. I think myself that the patrons were using something in the milk, but I couldn't get at it.

Mr. Anderson: When that milk was analyzed, was it found out how much mineral matter there was in it? And, what is the reason that over-ripe milk should be set at a lower temperature than normal? It seems to me more natural to set that milk at a higher temperature. That is what I am doing.

Professor Barr: In regard to the first question, our bacteriologist could not give us any information about the milk as to there being anything abnormal about it. Now, the other question, if you set over-ripe milk at a low temperature you can stir in more extract with safety, because it will not coagulate so quickly, but there is another advantage. You will find that when you set the milk at 82, and commence cooking at that temperature, cut the curd and cook it, that that curd will expel the moisture quicker than it does when you set it at 86 or 88, simply because it is in a more tender condition, and the moisture comes out more freely, so you have those two good things, you are able to stir in more extract and to get the moisture out more quickly.

Mr. Swingel: What do you call a low temperature over in Ontario for setting?

Professor Barr: It is very seldom we set under 82, and that with very over-ripe milk.

Mr. Swingel: And what do you call a high temperature?

Professor Barr: Anything over 86.

Mr. Swingel: I have to set my milk the whole season long at 90, and I cook it at 110 the whole year around, and then I don't get any too much cook. My cheese didn't show up any too good a body at the cook I was giving it, and it was in the whey two hours. My average test in June was 3.8, in July 3.95; in August it run to 4.2.

Professor Barr: You will have to cook milk rich in butter fat at a high temperature. The percentage of fat in the milk requires different temperatures for cooking to get the same result. The more fat, the higher temperature.

Mr. Aderhold in the chair.

Mr. Amberg: How fine would you cut your normal-working curd?

Professor Barr: I prefer myself having 3/8 inch knives. The blades are 3/8 of an inch apart and cutting three times. You can cook slowly, handle your curd more carefully by cutting finely like that, and you get it in nicer condition than when you cut with a half inch knife and have to handle it a little faster.

Mr. Aderhold: The knives that we buy are probably, nearly all of them half inch knives, and we ought to get somebody to make 3/8 inch knives.

Professor Barr: You can't get a half inch knife in our country now, except by ordering it.

Mr. Tessel: I have two 3/8 inch knives and I find that the horizontal knife works all right, but the perpendicular knife shoves.

The Chairman: Why don't you sharpen it?

Mr. De Haan: From the time you cut the curd, how long do you cook the curd in a normal milk?

Professor Barr: About forty-five minutes I like to take.

Mr. Waterstreet: What is your idea about rinsing the curd with water after the whey is off, just before salting?

Professor Barr: I was a very strong advocate of that for two years. I washed all the cheese I made for two years. I thought it was a good thing to do and there was a good deal of it done. This last two years we are doing but very little of it, giving it up, because we found there was a tendency to make an open cheese unless you are very, very careful. Where a man thoroughly understands it, he can make a nice cheese, but the tendency is toward openness.

Mr. Waterstreet: How did you use that water?

Professor Barr: Just put it on with a pail. I used a barrel with every curd. The curd was just milled and turned over two or three times until it was loose, then spread the water over. We used about fifteen pailfuls on a 5,000-pound curd.

Mr. Alvis: If the acid is in the curd, I don't think we can wash out very much.

Professor Barr: Well, I don't know how it happens, but you put the curd in water and leave it there for half an hour and try it and see what will happen.

Mr. Alvis: We simply pile it on each side of the vat and rinse it so it will go through thoroughly and quick, and I don't

think it will take out any acid, because the curd has got all the acid in it. Of course it will take off any acid on the outside, but the curd holds the acid, it can't expel much.

Professor Barr: You divide your curd sometime, wash one-half of it and leave the other unwashed and see how it comes out.

Mr. De Haan: How much rennet and salt do you use for a thousand pounds of milk in Canada?

Professor Barr: We are making export cheese altogether. In the spring we use about four ounces of extract to the thousand pounds of milk, and some years as low as a pound and a half of salt, from that to two pounds of salt. In the summer time we use about three ounces of extract, and this year we are changing our way of making cheese, we are getting drier curds and using less salt. This year one or two fellows I know ran the whole season with two pounds of salt, making a firm export cheese. On the other hand, two and a half is about the best salting that we do this year, while before this year—I have used three and a quarter pounds in the fall, but we are getting less moisture and less salt. We are doing away with a lot of this white whey that is spoiling your average and making that short, mealy cheese that we have so much of, and I daresay you have it here. Our cheesemakers made a big mistake four or five years ago. We used to make a firm, solid cheese, and the Englishmen commenced to object; they said we must have a more meaty cheese. Then our buyers came around and said we must have more moisture in the cheese, got to get a fatter cheese. Now, the result was that our makers left more moisture in the curd and made a harder, drier cheese than ever, and it has taken two or three years to get them worked back, till now they are getting to understand that the less moisture they leave in the curd, the fatter the cheese is, simply because you have the moisture in the curd; but when you put the pressure on, you get rid of nearly all of that moisture and you have a lot of white whey in the curd. You put the pressure on, and the result is that you have left a dry, mealy kind of cheese; but, on the other hand, if you have a nice firm curd and then you use lots of salt, there is lots of moisture to carry it off, and you will have that firm body and silky texture that we want. We have got to come to that, to put the cheese on the English market that

they desire; and if there has been any one thing that has given the Canadian cheese the standing that it has, it is this, that we have been paying close attention to our customers' needs. We know the Englishmen well enough to know this, that they do not care about two cents more for cheese or anything else so long as they get what they want. The only way we have made a success of it is that we have been trying to give them exactly what they want, and when we do that, they are not particular about the money they pay for it.

Mr. Alvis: Would you prefer more salt on a quick-working curd?

Professor Barr: No, not if the moisture was expelled anything like what it should be. The quantity of salt depends on the moisture in the curd.

Mr. Alvis: How much more rennet would you use with a very ripe milk?

Professor Barr: I would use as much as an ounce per thousand, if it was very over-ripe.

Mr. Aderhold: We have had Professor Barr on the rack and we have milled him and salted him and rinsed him thoroughly, and I think we have gotten a good deal out of him. I see a gentleman who has just stepped in whom we sent to Congress some time ago, and a good many of us feel that he has done more for the cheese industry of Wisconsin than any other man we ever sent to Washington, and we would like to hear from Hon. S. A. Cook of Neenah, Wis.

ADDRESS.

HON. S. A. COOK, NEENAH, WIS.

Mr. President and Gentlemen of the Convention: It would afford me great satisfaction if I could add a few words at this meeting that would be interesting to you for the general good of this association, that represents one of the great industries of our commonwealth; but while I am, as I trust you know, very

much interested in the success of cheese and dairy industries, my time is largely taken with various other lines of business, and I am not well enough informed on this particular subject to talk to a convention of men who have made the industry you represent a specialty, and are fully informed, or should be. I can say only a few words in a general way, bearing in mind that the ways of success in all legitimate industries have a close similarity.

First, a man in the dairy business, as in any other, must have good, common sense, with a will to do and desire to know—himself—how to do it and then take no more rest than is necessary until he has reached the high mark of his calling; that reached, he must add determination to guard it in the same manner so long as he remains in the business; for I know of no business, no matter how remunerative it may appear, that will continue profitable long, if right care is not continued.

It is wise to talk matters over with our neighbors, compare ideas, and profit by the better part of such ideas as we may get from others. But we must depend for our success largely on ourselves, and not expect our neighbor to carry our burdens. He usually has his own burden to carry. Knowledge is power if backed up by a will to do.

In our business, the manufacture of paper, the margin of profit is small, after deducting the cost of producing the article and putting it on the market, and yet we are confronted with the fact that we may have to take a less price for our product. What must we do? We must either bring into use more skillful management to keep our paper up to a high standard in quality, and produce more, without increasing our fixed charges, or go out of business.

The same conditions will apply to your great industry. While it is yet almost in its infancy in this great commonwealth, I believe it is soon to be first in quality and quantity of any state in the United States—and in quality it is possible that Wisconsin may not, even now, be excelled in any part of the world. And yet it is only in its infancy in the great state with its millions of acres of unused lands so richly adapted for the dairy industry.

You may not always be able to get the price for your dairy produce you feel you ought to have; you may not be able to raise

the price nor cut down the price of labor. But it is possible to produce more by combining knowledge with a will to do, and on the same fixed charges to get fifteen tons more hay or four hundred bushels more corn from forty acres of land. With this you can feed more cows; or, perhaps, better fed cows, better kept and better handled, will produce more milk of a richer quality. This, with about the same cost or fixed charges, would bring very satisfactory results.

There is no better place for the expansion of the mind, or place more honorable to expend it than on the farm. Get together, dairymen, cheesemakers, and farmers. Ask for just and fair legislation for all. Do not ask for gingerbread legislation; that is a luxury and helps the few. Ask for good, substantial, wholesome legislation of the bread, butter and cheese kind, and with harmony and united action, and stick-to-itiveness, you will succeed.

Keep up the high grade of your goods. There is always a market for such goods. Study to increase your product, and your success will be the greater, feeling that you brought it about by your own skill.

Mr. R. B. Watrous, Secretary of the Citizens' Business League of Milwaukee, presented to the convention the following letter of invitation, asking the convention to meet at Milwaukee again:

MILWAUKEE, January 7, 1904.

To the Officers and Members of the Wisconsin Cheese Makers' Association, in Convention:

Gentlemen: The Citizens' Business League congratulates you upon the great success of your present convention, the large attendance and the general excellence of your program. We assure you that it gives the citizens of Milwaukee great pleasure to have your association meet with us from year to year, and our organization, representing leading commercial, industrial and professional interests, takes great pleasure in extending to

you a most cordial invitation to hold your next convention in Milwaukee, with the assurance that we shall always be glad to join in extending to you a hearty welcome.

Wishing you continued prosperity, we are,

Yours truly,

CITIZENS' BUSINESS LEAGUE.
By R. B. WATROUS,
Secretary.

WISCONSIN CHEESE AT THE WORLD'S FAIR.

H. K. LOOMIS, SHEBOYGAN FALLS, WIS.

Mr. President, Members of the Wisconsin Cheese Makers' Association: It seems hardly necessary that any one should try to impress on the minds of those who are interested in the welfare of this state, the importance of a creditable exhibit of dairy products at the Louisiana Purchase Exposition to be held at St. Louis next summer, opening May 1st and closing December 1st. For the last forty years Wisconsin has been hard at work building up this great industry. Today we have in the neighborhood of $150,000,000 invested in the business. We should take pride in being able to say that Wisconsin is the second state in the production of cheese, and, as dairy farms are rapidly being opened up in the northern part of the state, it is only a question of short time when we shall produce more and better cheese than any state in the union. It is true, conditions are greatly in our favor. Our climate, soil and water are all we could ask. Notwithstanding all these natural conditions, we must not fail to take advantage of all opportunities to advertise and call the attention of people from other sections of the country to our dairy products.

Wisconsin has been more fortunate than most states in having so many good, thorough business men engaged in the dairy business. They have built up our dairy school that is second to none. Our dairy call-boards of trade are a great advantage to localities where they are held. Again we have an opportunity

to exhibit our dairy products at a great Exposition. We must keep up with the procession.

The dairy exhibit at the St. Louis World's Fair will be in the Agricultural building. This building has 800,000 square feet of floor space, covering nearly twenty acres of ground and divided into sections of about 100 x 40 feet. Refrigerator cases with all modern improvements will be erected on two of these sections in about the center of the building. One of the refrigerators will be used for cheese and the other for butter. These cases will be opposite each other with an aisle or passage way of about twelve feet. The sides and ends are to be of glass, permitting visitors to see the butter and cheese. Our space is limited; all we could secure was 16 x 8 feet. New York has the same number of feet in the cases as Wisconsin. All other states and countries have less. Wisconsin has the southwest corner of the cheese case and the southeast corner of the butter case, giving the advantage of the glass on the ends. No one can fail to see that we can display but few cheese and a small number packages of butter. It has been decided to secure the cheese for the exhibits from the dealers or cheese buyers, trying to secure cheese as far as possible from all parts of the state where cheese is made. The cheese will be entered in the name of the cheese makers and in case of award of medal or diploma it will be given to the cheese maker and the factory where made will receive favorable mention.

The rules governing the exhibit have not yet been approved by Mr. Taylor, chief of Agricultural Department. A draft of the rules has been made which I will read, and, as I read them, if any person present has any suggestions to make, or any changes he thinks would be improvement, I should be glad to hear from him. Mr. Sudendorf, Superintendent of the Dairy Department, is present, and I am sure he will place before Mr. Taylor, for his consideration, anything this body may think an improvement on these rules.

The address of Mr. Loomis was followed by a few remarks by Mr. E. Sudendorf, chief of the Dairy Department of the World's Fair, who also bespoke the hearty interest of all cheese makers of the state of Wisconsin, in the Louisiana Purchase Exposition at St. Louis.

Mr. Loomis: I must not forget to mention that there will be four tests during the season, namely, in June, July, September and October.

Mr. Michaels: How will the cheese be collected for that test?

Mr. Loomis: We expect to get these cheese from dealers, and for this reason, that the average cheesemaker while we consider him a good judge of cheese, oftentimes he has not the opportunity to judge anything but his own cheese. A buyer is handling the cheese of so many different manufacturers that he can judge them better. We can get them through those men and get a better run of cheese that will score higher than in any other way. We want the advertisement. If you want to send cheese, you can. The dealers give me the names and the cheese are delivered in your name. If you send a box of cheese there, it is entered in your name, or rather, if the dealer sends a box of your cheese. I know pretty nearly who the cheesemakers are in this state myself, and I do not believe that the dealers would attempt to take any advantage of them as has been suggested. It is to their interest not to do so.

The Chairman: It seems to me it would be well to appoint a committee of this association and take this up and leave it to them to work with Mr. Loomis. I think we will settle it that way.

ADDRESS.

SIDNEY C. THOMPSON, STATE DAIRY AND FOOD COMMISSIONER, WINTERPORT, MAINE.

Mr. Chairman and Gentlemen: We have all listened with a great deal of interest to the papers and discussions here, particularly those of Professor Barr. I cannot come before you as an expert cheesemaker, coming as I do from a state that is doing but little work in that direction. In our state we are mostly engaged in the industry of selling cream, and our creameries have driven the cheese factories, what few we had, out of

business. However, I have enjoyed your sessions, and have gotten a great many ideas, which I hope to carry back to the state of Maine, and assist, if possible, in increasing the cheese industry in our state. The cream and milk business is all right for those parts of the state that have special facilities for getting the product into the city in season to be used in the best condition but there are towns lying outside, way back, and there are many manufacturing their own butter on the farms, and even cheese, and they need assistance to secure the best results. I have been put upon your program as the State Dairy and Food Commissioner. That is a mistake. Our state is now trying and hoping to increase the interest in dairying, and our legislature last winter appropriated a sum for a special man whose time was to be employed in assisting the dairyman and the factories of the state. We have so many officials now in our state and so little room in the state capitol building that our people are much opposed to creating a new state office, and so it was given to the Commissioner of Agriculture to make the appointment, and I have styled myself,—with the Commissioner's consent,—a dairy instructor, rather than commissioner. We are hoping that in a short time we may have this department created, because we feel that it is necessary for the welfare of the state.

We have a great many fine opportunities there; we have markets very near to us, the cost of transportation is very little, the number of cattle are increasing, also the quality. The value of our dairy product for last year was estimated at $12,000,000. That seems small compared with your value in Wisconsin, which I think is $55,000,000, but we feel encouraged, we are starting in, and it was only natural that we should turn to some state that was doing work along the line that we are attempting, and we made inquiries in regard to what state would do us the most good. Several dairy schools were suggested, and we finally simmered down to three, namely, Cornell, Guelph, Canada, and Wisconsin. The reason why Guelph was not considered, was because it is on the other side of the line. We have a great deal of respect for those people over there, but we didn't care to mingle with them any more than was absolutely necessary. However, I am acquainted with some graduates from that school, and I feel sure that it must be

one of the best in the country. Men in New York state, who are up in the work, are free to admit that Wisconsin stands ahead so far as her dairy work is concerned. I am attending the dairy school at Madison, and this is one of the incidental meetings which I am having the opportunity of attending and which has been a most agreeable thing for me, I assure you.

Over in our state the demand is for a white cheese, not solid; it is made in granular form without any acid. The demand in the Boston market is largely for that kind of cheese. When I get out here and hear you people talking about milling and putting it on the racks and turning and all that kind of thing, it sounds like Greek to me, but I really believe that if some good live maker from the state of Wisconsin, or even from Canada, would come into the state of Maine and go into those sections that are not situated so that they can get the benefit of our market for cream, that there can be a great deal of money made in the state of Maine. These things should be managed so that we could get the greatest amount of good and the greatest amount of money to all concerned. So that if some of you people who don't think we are out of the world would be willing to live in the state of Maine for a time, would come to us and study the conditions and give us the opportunities that we need, I am sure that you would be repaid and satisfied with the business that you can do in the state of Maine.

I want to mention just one thing in connection with your work here, that it is really necessary that you people realize that you see yourselves as others see you, in a sense. Do you know that you have men among you making investigations along your dairy lines who have world-wide reputations? The name of Dr. Babcock is known everywhere over this country, and associated with that name are the names of Dr. Russell, of Professor Henry and Professor Farrington. Those people are as well known and as much talked about among the dairymen of our state as they are in the state of Wisconsin. We know what they are doing, and we know that while we have felt that we are a great deal behind you and have a great deal to learn, yet I find that those of our farmers and dairymen who have started in with the idea of becoming prosperous and doing good work, are all familiar with those names and the work that those

men are doing in the state of Wisconsin, and realize it, we sometimes think, better than the Wisconsin people do themselves. I am glad to say that in one respect our state is up to Wisconsin. I have visited some of the cheese factories and have seen the milk received at the Experiment Station creamery, and I am free to say that even in our conditions we are getting as good a quality as you are, in fact, I feel that we are getting better quality, but hardly dare say it before a convention of Wisconsin men. This matter has been one of great importance to us, and one we have had to study pretty thoroughly. Your people are holding conventions, trying to make the best quality of cheese out of the milk that you are receiving. You are paying speakers large sums to come here and talk to you on how to make a good quality of product out of poor milk. We have found out in our state that if we are going to ship sweet cream, we must have the best quality possible, and we have found out that it is impossible to get the best quality if we don't have the best quality of product to start with; therefore, we have been obliged to educate our farmers to the idea that they are a part of our system and that it is necessary for them to realize that their work is just as important as the work at the creamery, and that in order for them to get the best prices, they must take the best care and get that product to the factory in such a condition that it can be put on the market as a finished product in the best condition. I believe it would pay you people to spend some time in getting together. A friendly rivalry, contest, is all right, but do not work against each other. Work to elevate the quality of the product that you are receiving, and do not take the product at one factory which has been discarded at another, because it was poor. Our factories have formed an association and have agreed not to take milk or any dairy product that has been rejected by another factory. I believe you makers are in a certain sense responsible for the kind of product you are getting from those people.

We realize that we are not a dairy state, but we have increased the percentage of our product in the last year and we are well pleased with our progress in the last ten years, and if we succeed in the work already undertaken by following in your footsteps out here in Wisconsin, I am sure that some day you people are going to recognize us as a dairy state. Thank you.

At this point in the exercises Mr. Ben Dalley stepped forward, and on behalf of the association and as a recognition of the appreciation of the members for the services of the officers during the past year, he presented to Acting President Powell a watch and to Secretary U. S. Baer a seal ring.

Both gentlemen, in appropriate language, expressed their gratitude for the gifts.

Recess till 2 o'clock.

Convention met at 2 o'clock same day.

President Powell in the chair.

Upon the opening of the convention in the afternoon, the most attractive object in the room proved to be a fine Swiss cheese, made by Mr. Marty. This cheese having taken the first prize, Mr. Marty was asked to come forward and tell the convention how the cheese was made, but declined to do so.

Mr. E. L. Aderhold, the dairy critic, reported as follows:

Now, for the criticisms on this cheese which has been on exhibition and scored downstairs. We have made criticisms under the head of flavor under the following terms: heated, old, rank, musty, off, not clean, fruity, sweety, vinegar flavor, roots or turnips, wild carrot, acorn, sharp starter flavor, sour flavor, old milk flavor. I guess that is about all of them. The heated flavor comes from cheese that have been kept at too high a temperature at some stage of the game, usually while they were young. Most of you are familiar with that and you know the cause of it. The old and rank flavor sometimes come from unclean cans or filthy whey tanks are often the cause of such things, or sometimes unclean factory condition and surroundings. Old milk sometimes that is only a day old or two days old, or the starter sometimes gets too old and gives a kind of old, rank flavor, and there is the musty flavor. That might come from the absorption of odors by the milk or from some other unclean conditions, mouldy condition. Off-flavor, that means a good many things. I am not going to try to tell you all of them. Not clean. Of course when we come right down to the business, you will remember that ninety-nine per cent. of our

cheese is made from milk that is imperfect, more or less, and you couldn't have a clean flavor; it would be almost impossible, it would be unreasonable to expect it when we know the conditions the milk is produced under, in stables not well ventilated and where the odor is pretty strong, and of course such milk is imperfect to start with. That is the reason why less than one per cent. of our cheese has got the clean flavor.

Then there are the flavors that come from fermentations, such as sweety, fruity, and vinegar flavor. If you will take the report of last year's convention you will find where Professor Dean treated of that subject very comprehensively. He had two samples of cheese with him, one had a decided fruity flavor, and the other a vinegar flavor. I found, while judging at the State Fair last fall, quite a number of the cheese had that vinegar flavor, and the same is true here. Some call it fermented wine flavor. It is very easy to catch it. This comes from germs, as Professor Dean said, that were distributed in the surface of the soil, in the roads and some have been found on trees around farm buildings, and they fall into the milk and cause these flavors.

Then there are the food flavors, such as roots, turnips, rape and a number of others. Of course you will understand the cause and the prevention of this. We had one cheese that smelled just exactly like a sour crab apple and one of the judges claimed that cows are very fond of wild crab apples, and these cows had evidently been eating them. Another smelled like acorn flavor. Then there are other flavors that are wrong, that are due to the negligence of the cheesemaker in making his starter. Some starters are too old and too sharp, or perhaps too heavy, too thick, so that perhaps they affect the flavor of the cheese; they have a kind of a sharp, sour, acidy flavor. Then there is the old milk flavor. In the fall, when the weather is cold, and you only make cheese every two days and you have some frozen milk; of course that affects the flavor; you can't expect as fine and pleasant a flavor as when the cows are on pasture. That is all about the flavor, unless there are some questions. If not, I will pass on to the texture. The criticisms under that head are mechanical holes, loose texture, gas, coarse texture or not smooth, lumpy, harsh, soapy, sticky, weak, young and curdy.

The mechanical holes are caused by insufficient pressure, or by pressure that is not continuous enough. I do not believe that it is necessary to have extreme hard pressure on cheese to close it up, especially the small varieties where you have a small diameter, but I do believe it is necessary to have continuous pressure, especially on the small varieties, because where they make the small cheese, they usually take them out the first thing in the morning one at a time, and they are not in the press as long as they ought to be. The pressure ought to be continuous for that kind of cheese.

Mr. Waterstreet: Are mechanical holes always due to insufficient pressure?

Mr. Aderhold: I should think so, generally, yes. Do you know of any cases where they are not?

Mr. Waterstreet: No, I do not.

A Member: If you have a sweet curd, you will have mechanical holes.

Mr. Aderhold: Who is making sweet curd cheese? Cheddar cheese is not sweet curd cheese ever.

The Member: I don't mean exactly sweet curd, but any cheese that is a little too sweet, you will find mechanical holes with the very best pressure.

Mr. Aderhold: Next comes "loose." You find cheese sometimes that is seemingly all right, and when you pull the plug, it isn't all right; there seems to be a little gas formed in there that loosens it apart. Of course we have gases that form in cheese from imperfect milk or from too high a temperature in the curing room, and that makes open cheese.

Now, as to the texture, the feeling of the cheese. It should be smooth and silky and still firm. Where, when we mash it up, it is coarse, that is often caused by over-ripe milk, or by an insufficient cook or an imperfect cook, as Professor Barr explained. If you hurry it too much, you are going to have a coarse texture. Then we have some that seem to be plenty firm enough and when you come to mash them, they seem to be lumpy. I thought that might be caused by an imperfect distribution of salt for one thing. Perhaps the salt was not perfectly dissolved before it was put in the press. And another thing, the curd in maturing is uncovered and becomes very dry at the surface, so dry that it becomes red, and I know positively of cases where they would

make little lumps in the cheese that are harder than the rest of the cheese is, that was not exposed to this drying process. The curd should be turned in such a way that every piece will be in the center of the pile as much as another piece, so that the air will not have a chance to dry the surface.

A Member: Wouldn't it also be caused by the curd being left in too large pieces?

Mr. Aderhold: That might be, if it is uneven, the small pieces will absorb the larger proportion of salt to the amount of curd, than the large ones, and they would be a little harder. Then we certainly have ferments in our cheese which prevent a good texture. I can't give a scientific explanation of it, I don't know that anybody can, but there are some of the ferments that injure the flavor and injure the texture also, so that while some cheese are very well made and are good cheese, there are some of those agents at work that prevent a real fine silky texture. A frozen milk, I believe, is always liable to injure the texture of the cheese; it is a little apt to be a coarser and looser texture than it would be if the milk was not frozen. The soapy texture, I believe, is caused by fermentation usually. Then there is the weak bodied and sticky cheese. Of course that comes from being too much whey or too little salt, too much moisture in the cheese.

A Member: Don't the cooking and the salting have a good deal to do with it?

Mr. Aderhold: If you leave in too much whey, that might be the cause of too much whey being in there.

The Member: You have to scald it in order to get the whey out of it.

Mr. Aderhold: Certainly. I want to make one remark about the age of the cheese. I believe this association, before it closes, ought to pass a resolution to prevent in future any cheese being exhibited here that are so young that they are not well broken down. I believe it is an injustice for us to take in those cheese and score them. We don't know what they are going to be when they are cured. We had cheese at the State Fair last fall that was less than two weeks old, simply a mass of curd. They ought to be at least two months old. If you have got any good cheese any time during the summer, put them in a good, cold place and keep them there and exhibit them.

The American cheese that got the highest score would have scored quite a little higher if it had been old enough to have had the texture that it ought to have had.

Member: That was made the 9th of October.

Mr. Aderhold: It was not old enough to have a full silky texture or a full flavor.

Now, as to the color. We had only a few that were off in color; we had one or two that had some white specks, I don't know whether from an uneven distribution of salt. Of course the curd that gets the most salt, there will be the more moisture expelled from it, and the more moisture you expel from the curd, the higher the color will be. A few of them were a little streaky in between where the layers of curd were and I don't know but what some of them used poor rennet or too much rennet perhaps, which has certainly quite an effect on the color. Then we had a few that were colored too high. I don't think that any buyer commends such high color. A good many cheesemakers that use less than the usual amount of color do not have any kicks on that account from the buyers. I would rather see them use too little than too much.

Now, the make-up is a good deal better than it used to be three or four years ago, since we have had this educational contest going and the criticisms are sent to the makers. We have a little trouble yet from the high edge that comes from the follower being too small and we have quite a few that are too long in the bandage, turn over too long, and sometimes little wrinkles, not quite well dressed, but, on the whole, the make-up is a good deal better than it used to be.

Mr. McKinnon: Will not age overcome those little lumps you speak of?

Mr. Aderhold: No, sir; of course, it will overcome it to some extent, but we have cheese here that are well broken down and they still show it.

The Chairman: There is a thought that occurs to me very often in regard to the scoring of cheese where we have the flavor maximum 45 points, and texture, 30 to 35. Now, don't you find that it has always been in a large majority of the factories that the maker gives his whole attention to the texture and appearance, and neglects the flavor entirely?

Mr. Aderhold: The cheesemakers never try cheese for the

flavor, and the buyers hardly ever reject cheese on that account, and still in scoring, it has a higher number of points. Of course, the idea is that they ship cheese out so young that they can't have much flavor in the factory. One of the resolutions passed here was to request the Dairymen's Association to send their instructors out early enough so that they could attend the annual meetings at the factories. Last spring I asked the association to turn me loose early enough so that I could do that with the idea that I could accomplish a good deal at the annual meeting, and they turned me loose the first of March, and during the season I held meetings in sixty factories and thirty-three of those sixty meetings were what you might call business meetings where the farmers made rules for the operation of the factory for the ensuing season. My object in attending these meetings was to start up a demand by the farmer for better factories, better equipment and cleaner whey tanks, and I could show them that they could not afford to have the factories run as the average factory is being run; that they were wasting a lot of money in that way; that the cheesemakers ought to do a good deal better job, and if they were willing to do it, the farmers ought to be willing to pay a little more for it. Out of those thirty-three business meetings I arranged, at nineteen I succeeded in getting the farmers to raise the price of making; in two instances it was one-eighth of a cent; in one instance three-eighths of a cent, and at the rest of them it was a quarter of a cent raise for making, on condition that the cheesemaker should keep the whey tank cleaner and improve the factory in other respects as fast as he could, and in some instances on condition that he put in curd agitators, and in that way increase the yield of his cheese. Now, I believe that an outsider can do a good deal more in persuading the farmers to such action than the regular maker can, and there are reasons for that. They often know too much about the maker to believe everything he says, but you get a stranger there and they often take a lot of stock in him because they don't know him. If a man makes it his business and he knows just how to put it before the farmers to make them see that it is not alone how cheaply we can get our cheese made, but also what kind of a job we will get for our money. I tried to show them that it depended as much or more on the kind of a job they were getting than the price they

were paying for the job. In one instance the cheese maker was receiving a cent and a quarter for making. I told him when I got through with my talk he should ask a cent and three quarters, because I expected they would pull him down some. When I got through talking, they asked him, "Now, what do you want, what do you think about it?" and he couldn't talk for sour apples. He says, "I will be well satisfied with a cent and a half," and that is all he could say. One farmer says, "If you will make the improvement that this man is talking about, I just as soon pay you a cent and three-quarters." Another farmer says, "How is it, are you willing to improve your factory as fast as you can?" He says, "Of course I am." Then one of the farmers made the motion that they pay a cent and five-eighths, and it was seconded and carried, without a dissenting vote. They paid him more than he asked, and if the association turns their men loose early so that they can attend these annual meetings, can arrange a date with them that won't conflict with other dates that he has made, it will be a good thing. Let the instructor know about three or four weeks ahead when you want to hold your meeting. I want to say something in answer to what Mr. Scott said the other day. He said he was making more money than he did when he worked on a farm. Well, I don't know what kind of a farmer he was, or how much he earned when he was working on the farm, but I believe that he has got patrons today that are making more money off their farms than he is making off his factory, and they know what their farm is going to pay them next year, while Mr. Scott doesn't know what his factory is going to pay him. There have been some arguments made here in opposition to the idea of raising the price of making at factories that were very poor arguments. When a farmer comes to hire a man, he finds that he can get one man for fifteen dollars, while for another man he has got to pay at least twenty, and he knows that while he pays him that much more, he may do twice as much work, and he won't eat any more than the other fellow. Now, if I can apply that same principle to your patrons and show them that it pays to work on business principles, convince them that the business belongs to them, to the farmers, the milk belongs to them, the cheese belongs to them, they are simply paying the maker for the job he is doing, and if I can convince them that

by paying a little more, they can get a good deal better job and the maker is willing to give them the better job, it is better all around.

A Member: But don't you know that we may have our meeting and the other fellows have their meeting, and they say to him, "Come around," and some other maker comes along and offers to work a little cheaper, and before you get through you will probably lose one or two thousand pounds of milk, and our money is invested in the business, and we don't like to lose any of it.

Mr. Aderhold: I know how things go. The other fellow is a cheap skate, and when you send milk away he will take it. Now, you mustn't be so afraid of losing a patron. If you lose a thousand pounds of milk, or fifteen hundred, and you get a quarter of a cent more for making, you are better off financially, and that milk is going to come back unless the other fellow gets the same improvements that you are getting in. I know of instances where the farmers have raised the price and the factory man is cleaning his whey tank every day, and you couldn't get those farmers to go to any other factory and take their dirty whey, even if they only paid a cent and a quarter for making.

The Chairman: It was suggested that there be a committee from this association on the Wisconsin Exhibit at the World's Fair. If there is no objection, I will appoint a committee of three, viz.: Mr. Aderhold, Mr. Noyes and Mr. Baer. These three men are traveling over the country and have had experience in this line before, and will act as the committee unless there is objection.

Mr. McKinnon: The question of competition up with us is a very serious question. I live not very far from the village of Sheboygan Falls and am running a large factory now. I have been making for the last year at one and a half cents a pound. They are making in the village of Sheboygan Falls for one and a quarter, and they are able to pay better dividends than I can pay, and consequently there is an inducement to our patrons to go to the Falls, and they have the same inducements, of course, to make their factory first class that I have to make mine first class; that is, they give first class accommodations to the patrons, the same as I do, and I have that to contend with,

and I know of no means of overcoming that unfair competition. I do not believe in forming the cheesemakers into a syndicate and controlling the whole thing, but I do believe that we should have a cent and a half for making and that we should do the very best we can under those circumstances. Mr. Scott, who spoke here the other day, is in the same position; he would be very glad to get more for making his cheese if he could, but if he raised his price a large number of his patrons would go to Sheboygan Falls, which is almost as near to many of them as his place is. Now, if there was any way of reaching those factorymen who are cutting their own throats, so to speak, we would like very much to reach them. On this question of one factory taking milk rejected by another, our boards of trade have wisely passed a resolution, that no man can belong to our board of trade or sell cheese upon it who has taken milk that has been refused at any factory, consequently, we do not have that trouble of a man running from one factory to another. We are attending these conventions year after year, aiming to reach the weak spots in our system of making cheese, and I hope that during the next year we can so far come together that we will be willing to stand together upon a fair basis for manufacturing cheese.

HINTS UPON THE CONSTRUCTION AND EQUIPMENT OF CHEESE FACTORY BUILDINGS.

U. S. BAER, MADISON, WIS.

LOCATION OF FACTORY.

In the location of a cheese factory no one thing is more important than to secure a well drained site, and yet, this is, in many cases, the last thing thought of. The foundation of cleanliness in a cheese factory begins with the sewer. Other things being equal, then, elevated ground should be selected as a proper site for a factory. Another matter that may prove of

considerable value is a regard for the natural or artificial shelter that may be given the factory building. A difference of eight or ten degrees in the curing room temperature can oftentimes be secured by having a due regard to the advantages of shade from groves or the channels of natural air currents. The surroundings should be such as to insure pure air with little dust. Trees and shrubs around the factory aid in purifying the air. If you can choose a site for the placing of the factory, a north side hill is better than any other. The east is better than a west slope, but a north exposure for the curing room is the best, so that if you have windows they may be on the north side. It is not well to locate the building on a bleak site, exposed to the full rays of the torrid summer sun or to the cold winds of winter. A reliable supply of good, pure, cold water is another requisite of very great importance to be considered in the selection of a factory site.

SEWAGE.

The problem of sewage is "How shall the organic matter present in the washings or sewage of factories be so disposed of with the least cost that they shall not create nuisances either on the surface of the soil, along the banks of streams, or by their excessive presence in the water of streams, or that they shall not pollute the water of streams or wells which may be drunk either by man or beast with injury to health as a result." On the papers distributed I have had struck off the plan of surface system sewage as presented before this convention at the 1902 meeting by Prof. Archibald Smith of Strathroy, Canada. I am informed that this is giving entire satisfaction wherever the system has been installed.

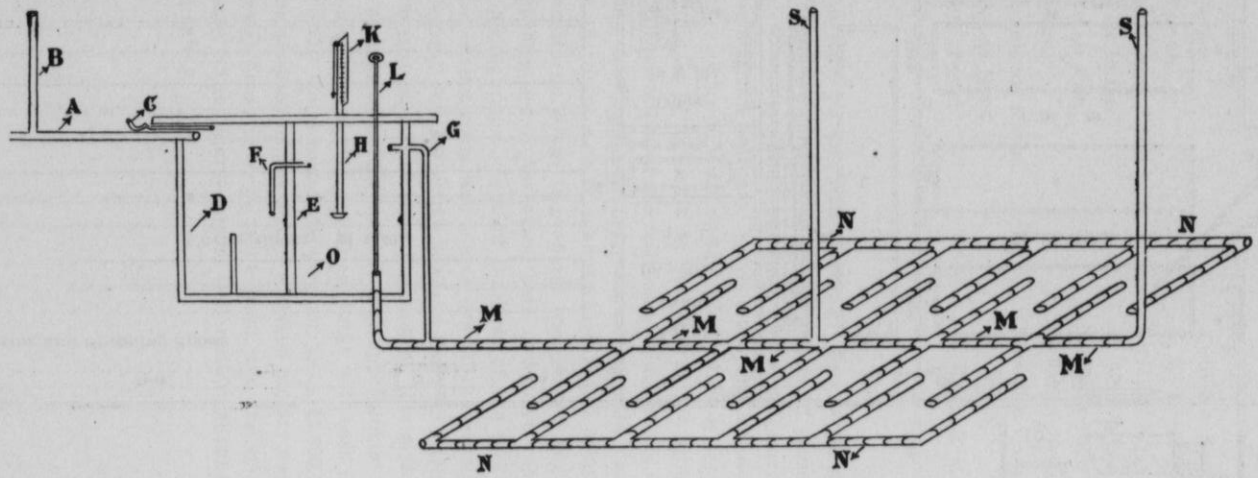
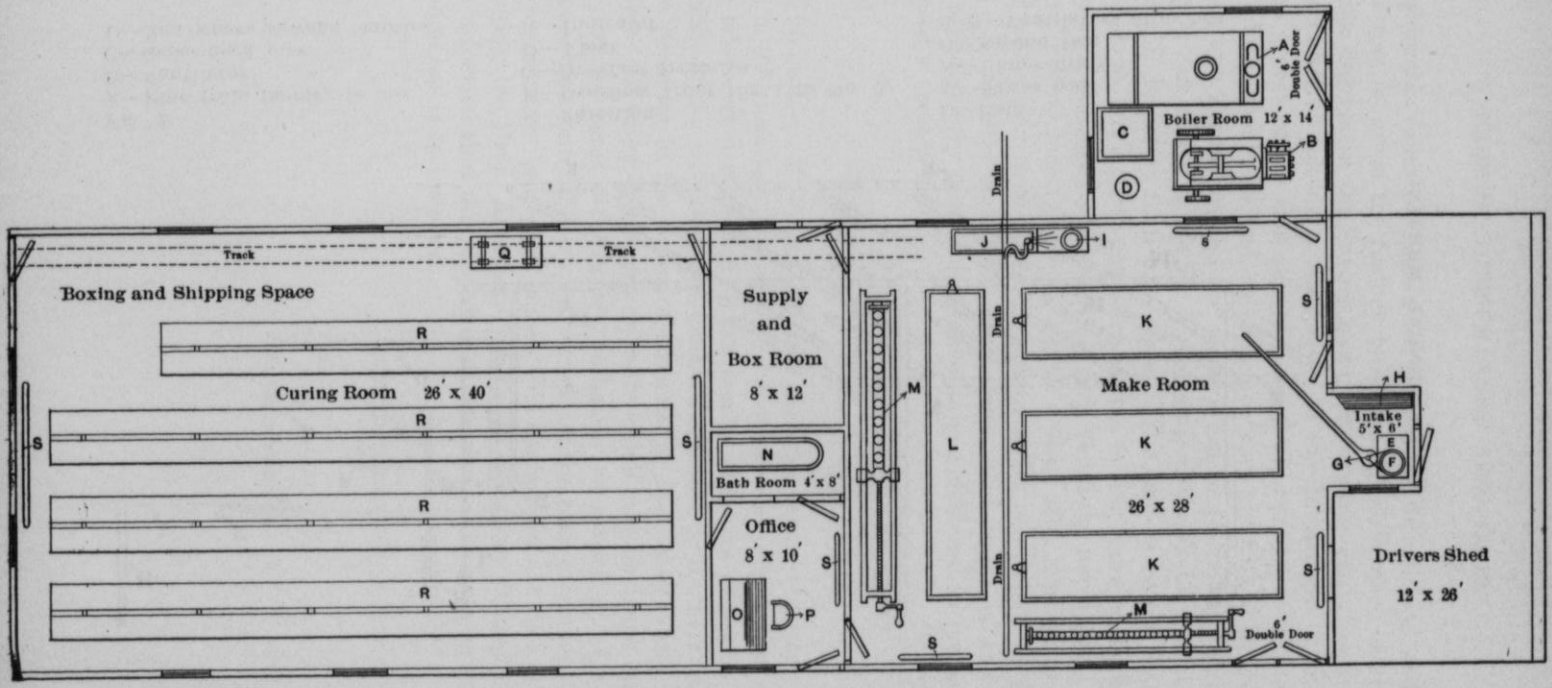


FIG. 2.
A—Pipe from factory to box.
B—Ventilator.
C—Goose-neck pipe.
D—Box where sewage empties.
E—Partition.
F—Overflow from No. 1 to No. 2.
G—Overflow from No. 2.
H—Float.
K—Indicator.
L—Plug.
M—Filter bed.
N—Under drain.
O—Second Box.
S, S—Ventilators filter bed.

PLAN FOR CHEESE FACTORY.



A—Boiler.
B—Engine.
C—Sterilizing Oven.
D—Well Pump.
E—Weigh Can.
F—Scales.
G—Conductor Spout.
H—Bottle Rack.
I—Milk Tester.
J—Wash Sink.
K, K, K—Cheese Vats.
L—Curd Sink.
M, M—Cheese Presses.
N—Bath Tub.
O—Office Desk.
P—Office Chair.
Q—Truck.
R, R, R, R—Curing Tables.
S, S, S, S, S, S, S—Steam Radiators.

The cut shows plan designed for large model cheese factory converting from twelve to twenty thousand pounds of milk into cheese daily. The contour of building, and arrangement of apparatus is recommended for neatness, convenience and economy of space and cost. Another advantage which this plan offers is that which admits of the weighing in of the milk at one end of the building and the delivery for transportation of the finished product at the extreme rear end without the unnecessary transferring of the milk, curds or cheese back and forth in the process of manufacturing and curing as is often the case in factory buildings improperly constructed and equipped.

The locating of the office, bath and store rooms between the make and curing rooms shuts off the heat of the make room from the walls of the curing room and places the office and store rooms in the most convenient and accessible position from all parts of the building.

The cost of a first class building of this style with ten foot ceiling and cement floors throughout will approximate $1,100.00.

The accompanying specimen outfit will cost in the neighborhood of $1,100.00. Total cost of factory complete, $2,200.00.

The question of the cost of a cheese factory depends upon the number of cows cheese is to be made from, and the style and capacity of machinery. The figures given will enable anyone to make their plans with safety.

SPECIMEN OUTFIT LIST.

For 800 to 1200 Cow Cheese Factory.

1 12-H. P. Boiler complete with all fittings and stack.
1 8-H. P. Horizontal Engine, Complete.
1 4x6 Marsh Deep Well Pump.
3 Sets Baird's Automatic Curd Agitators.
1 36-bottle Turbine Tester, Complete.
2 "Barber-Colman" Check Pumps.
2 900-gal. Galvanized Steel Whey Tanks.
3 600-gal. Improved Steam Cheese Vats.
2 Continuous Pressure Steel Gang Presses.
1 Curd Sink with Racks and Castors.
1 Power Knife Curd Mill.
1 600-lb. Scale, Double Beam with Wheels.
1 240-lb. Tin Scoop Counter Scale.
1 80-gal. Weigh Can.
1 Conductor Head and 10 feet of Trough.
50 14½-in.x7-in. Tinned Gang Press Hoops.
2 8-in.x20-in. Horizontal Curd Knives.
2 8-in.x20-in. Perpendicular Curd Knives.
4 Long-Handled Half-gallon Dippers.
1 Strainer Dipper.
3 Half-round Whey Strainers, with Spouts.
2 Tin Curd Scoops.
2 Flat-sided Curd Pails.
2 Marschall Rennet Tests.
2 16-oz. Glass Graduates.
1 Tinned Cheese Knife.
1 Set Months and Dates.
1 Set Test Instruments with Quevenne's Lactometer.
1 24-bottle Curd Test.
12 doz. Composite Milk Jars.
6 8-in. Floating Dairy Thermometers.
1 Hygrometer.
1 Shelf Scraper.
6 Galvanized Iron Pails.
1 6-in.x⅝-in. Cheese Trier.
2 14-in. Wood-head Mops.
4 Floor Brushes.
6 Heavy Floor Brooms.
6 Scrub Brushes.
6 Composite Test Jar Brushes.
1 Bath Tub.
I Office Desk.
1 Office Chair.
1 Sterilizing Oven.
5 4-ft. Cast Iron Radiators.
2 8-ft. Cast Iron Radiators.
Necessary connection pipe for boiler, engine, pump, wash-sink, tester, vats, radiators, and whey tanks.
Necessary check, globe, and angle valves for above connections.
Necessary ells, tees, unions, nipples, reducers, couplings, plugs, etc., for above connections.
Necessary shafting, hangers, wood-split pulleys, and belting for driving curd agitators, curd mill and well pump.

CONSTRUCTION OF MAKE ROOM.

Since cheese making is carried on in such wide ranges of latitude and longitude and under such varied conditions, it becomes impossible to have a set plan for a factory building suitable for all conditions and requirements. There are, however, some essentials which every cheese maker should take into consideration in arranging his building and equipment to secure both convenience and cleanliness as to perform the daily labor in the factory in the easiest possible manner and under the most economical conditions. The size of the building is, of course, to be measured by the amount of milk to be manufactured therein, but the same internal arrangement is needed alike in both small and large factories.

On the papers you hold, will be found figures showing floor plan of cheese factory, sections of cheese curing rooms and of multiple sub-earth ducts.

Without question a brick building is not only the most sanitary but is also the cheapest in the long run. Although the first cost may be somewhat greater in some localities of the state, for a brick than a frame building, yet, when we consider the high insurance and the necessary repairs of a frame building, the brick or grout building is none too expensive or elaborate for a cheese factory. Because of the short time at our disposal we shall briefly consider the construction of the frame building only.

The building should be laid upon solid foundation walls rather than upon piers. Besides adding decidedly to the appearance of the building, it aids materially in keeping the building warm in winter and cool in summer.

The upper-structure, consisting of make-room, boiler-room and curing-room, should offer as good protection from the elements as a well built house does. The building should be covered on the outside with two thicknesses of boards, with a layer of 3-ply acid and water-proof paper between. The outer thickness of boards should be good drop siding. The inside finish should be of matched and planed lumber, thoroughly protected with hard oil. The outside should be neatly and tastefully painted. Use light colors as they reflect the sun heat while dark shades absorb the heat. Put an awning roof over the de-

livery window, wide and large enough to cover a wagon and team. Construct the platform for the scales and weighing-can on a level with the top of the vats.

CONSTRUCTION OF FLOORS.

In the choice of floors there is no longer any question but what cement fills all the requirements and if constructed properly, is sanitary, substantial, and much superior to wood. The floor should be laid the last thing after other work is completed. The floor corners should be rounded. A wainscoting of two feet, built of cement, will be found advantageous. The ground floor should be thoroughly tamped so that no future settling shall occur to crack the cement. Next comes a good, thick layer of cinders, which insures a dry floor. Four inches of concrete, made with good Portland cement, using one part of cement with from four to six parts of coarse, clean gravel and sand free from earth, is laid upon the tamped cinder bed. The finishing coat should be made with fresh Portland cement and clean, sharp sand or finely crushed granite in the proportion of one of cement to two of sand, laid three-fourths of an inch thick.

The concrete should be laid in strips about four feet wide across the floor and thoroughly rammed, then cut crosswise into blocks four feet square. As soon as one strip is laid, rammed and cut, it should be given its finishing coat of Portland cement, thoroughly trowelled while setting to avoid shrinkage checks. After the blocks have been trowelled, they should be wet with a brush and sprinkled with dry, pure, Portland cement and then trowelled smooth and hard so as to give a glossy surface which will be water tight and easy to clean. Each strip of the floor should be completely finished before beginning the next, and the materials mixed only as fast as needed for use. The floor should slant rapidly to the gutter, also made of cement, so that all water will quickly run off. It is useless to have a factory floor wet all of the time; it can be kept neat and dry by a suitable system.

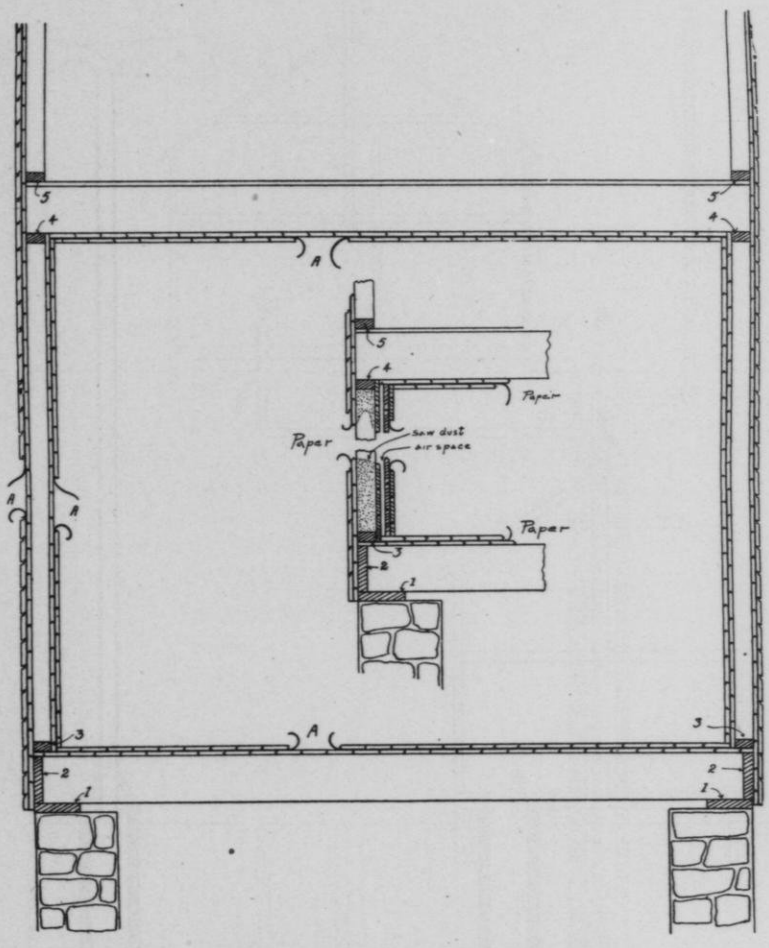


FIG. 3.—Showing the construction of wooden curing room. 1, 1, 1, Sill; 2, 2, 2, a two-by-ten spiked to ends of joist; 3, 3, 3, a two-by-four spiked down after first layer of floor is laid to toe-nail studs to; 4, 4, 4, a two-by-four spiked to upper ends of studding of first story. A, A, A, A, three-ply acid and water proof paper. The drawing in the center shows space between studding filled with saw dust and another dead-air space to be used when the best ducts cannot be provided.

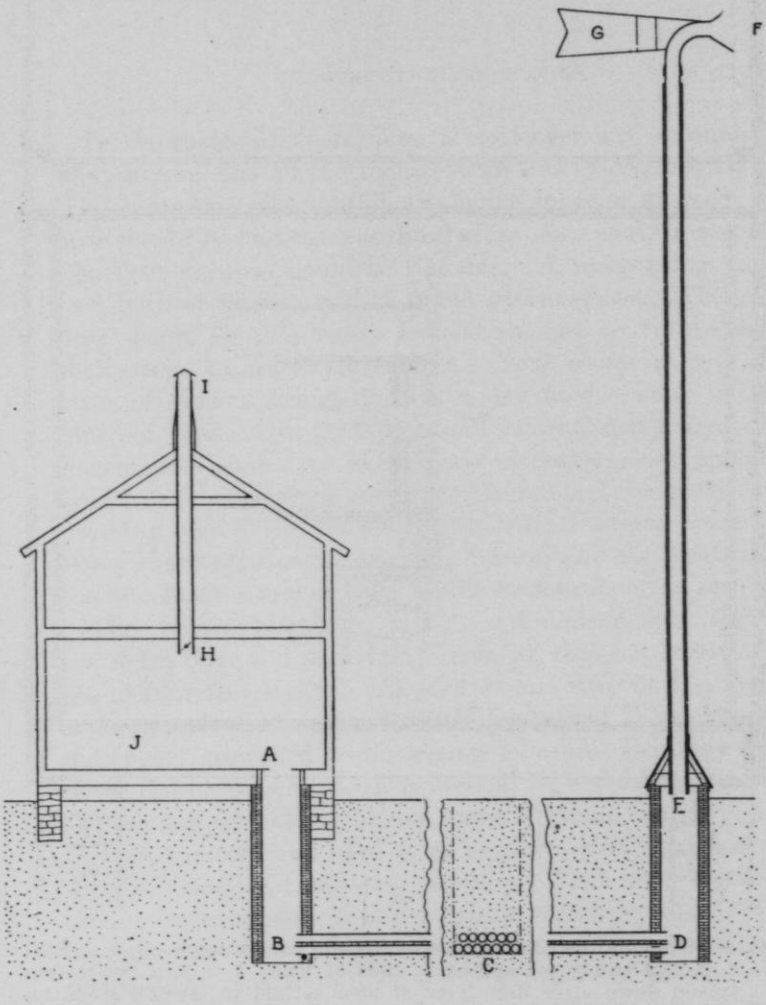


FIG. 4.—Section of cheese curing room and horizontal multiple sub-earth duct. A, inlet to curing room; B, end of sub-earth duct in bricked entrance to factory; C, cross-section of the multiple ducts. D, E, bricked entrance under funnel at outer end of sub-earth duct; F, funnel with mouth 36 inches across; G, vane to hold funnel to the wind.

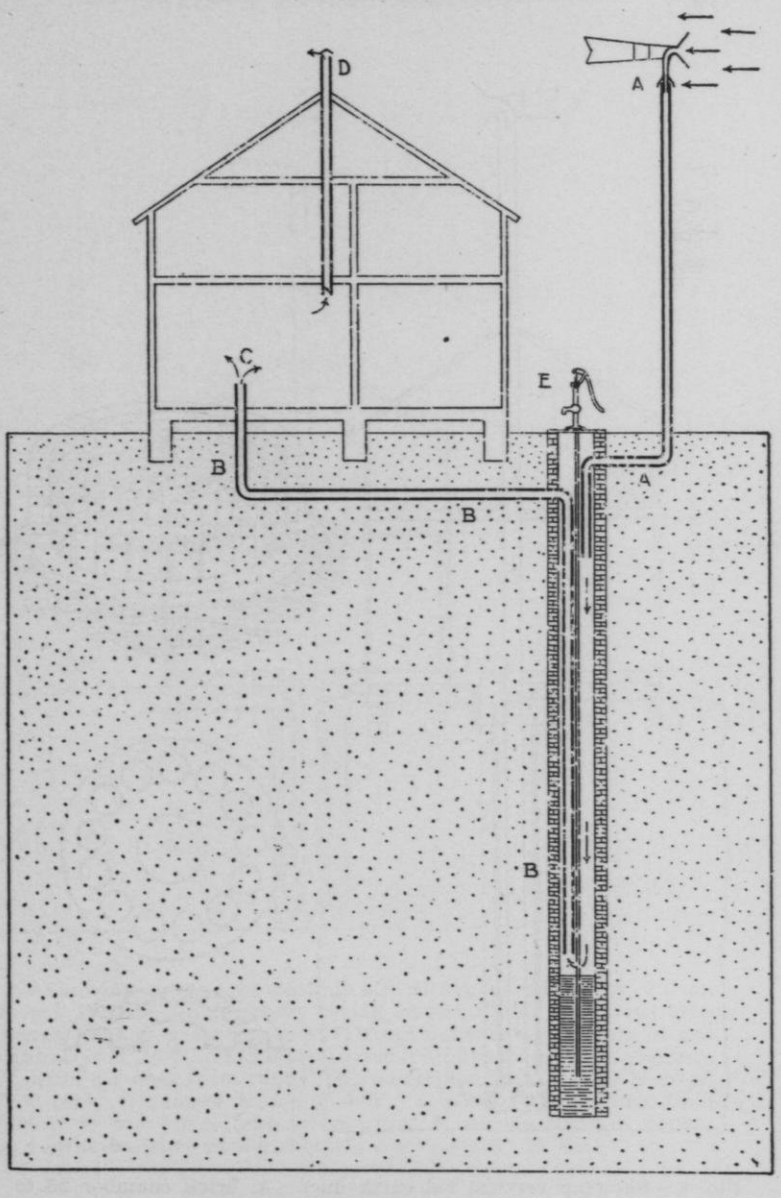


FIG. 5.—Showing vertical section of factory and sub-earth duct in well. A, A, funnel taking air into well; B, B, B, duct leading air from well to curing room, C; D, ventilator.

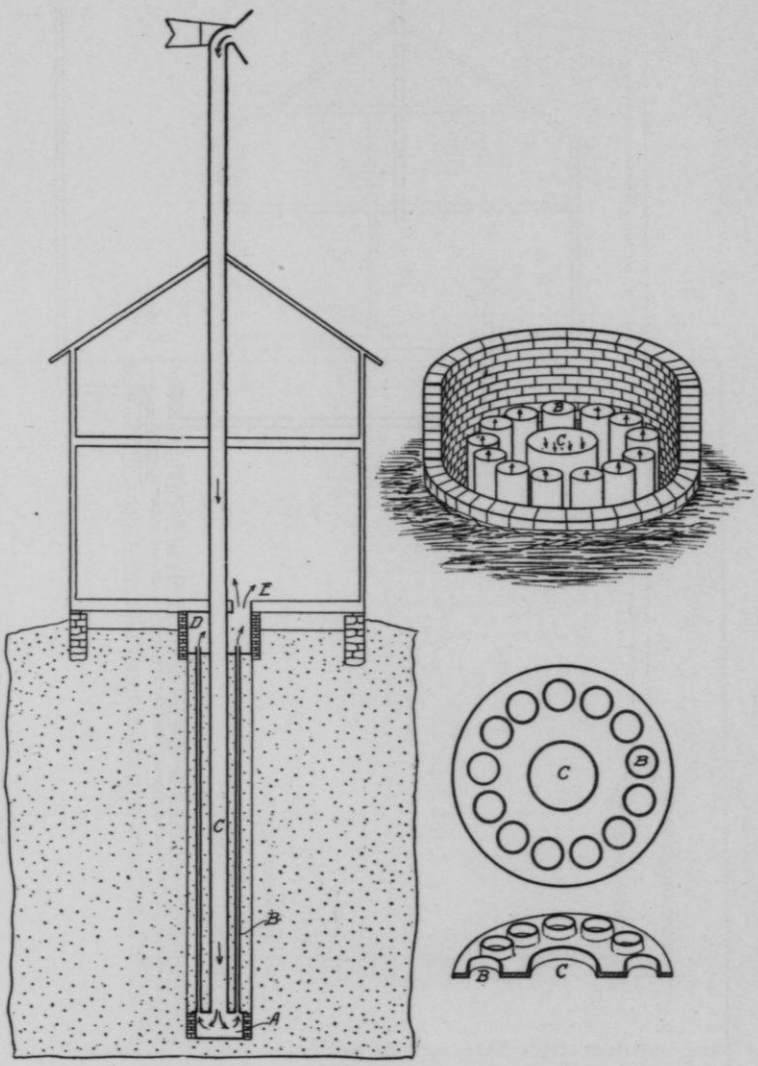


FIG. 6.—Showing vertical sub-earth duct. A, brick chamber 25 to 30 feet below surface and 40 inches inside diameter; B, tile or conductor pipe of galvanized iron; C, main shaft of funnel; D, brick chamber at upper end of duct. The circle and section represent a cast iron plate to cover brick chamber A.

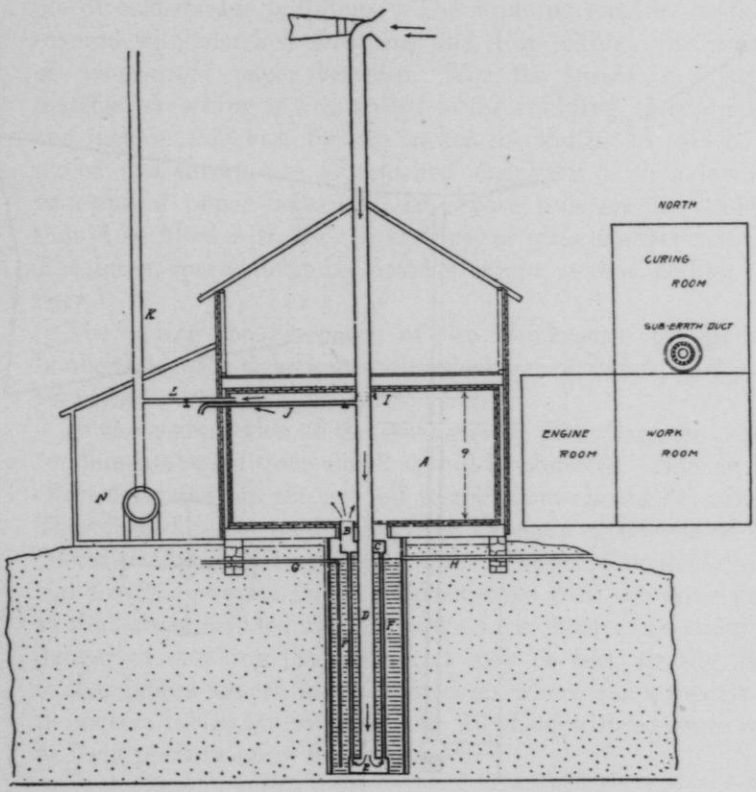


FIG. 7.—Showing method of cooling air with cold water. A, curing room; B, duct leading into curing room; C, E, galvanized iron drums, air and water tight; F, thirteen or more 5-i cnhflues of galvanized iron, 10 ft. long, soldered water tight to drums to cool air; D, main air duct from funnel; G, water pipe from pump; H, overflow pipe; I, damper in main shaft; J, 4-inch pipe leading from blower to use when there is no wind; K, smoke stack of boiler; L, ventilator from curing room to smoke stack; N, boiler.

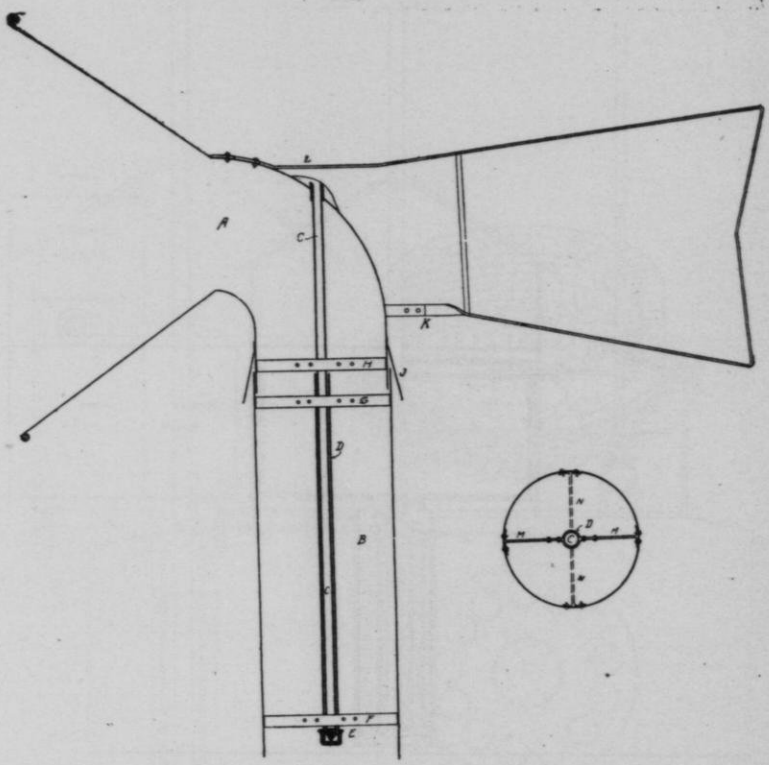


FIG. 8.—Showing how funnel and vane may be mounted. A, funnel; B, shaft of funnel; C, C, C, 1-inch gas pipe; D, D, 1¼-inch gas pipe; E, cap for support of 1-inch gas pipe; F, G, H, and M M and N N are stays of band iron bolted together and to the sides of the shaft to support the axis of the funnel; J, weather collar to turn rain out of shaft. K, L, band iron to stiffen vane and attach it to funnel.

CONSTRUCTION OF WOODEN CURING ROOM.

The construction of the curing room should be on the principle of cold-storage buildings. The studding outside should be covered with matched sheathing and drop siding, with a layer of water-proof paper between. For the inside, a layer of matched sheathing is first nailed to the studding, then strips of one inch in thickness by two inches in width, to which are nailed two thicknesses of matched sheathing, with a layer of water-proof paper between. The space between the studding should be filled with cork or sawdust or some similar material. The inner spaces must be closed air-tight at the ceiling and floor.

The ceiling should consist of two thicknesses of matched lumber laid with tight joints with the layer of water-proof paper between.

In the construction of the curing room floor there are certain fundamental conditions which should be observed. The cooling effect derived from the ground temperature should be utilized. Therefore the floor ought always to be made of some good conductor so that it will be always cool. The most available material for this purpose is the solid concrete with the same finish as that recommended for the make room floor. To avoid the danger of cracking the cement, it may be best to dig holes twelve inches square and a foot deep where the supports for the cheese tables are to come, and fill them with concrete so as to form piers to carry the weight.

METHODS OF COOLING THE AIR IN CHEESE CURING ROOMS.

It is plain that no matter how perfectly a curing room has been constructed, its temperature must rise steadily higher and higher as the summer advances. If, therefore, the temperature is to be held down, some cooling device must be adopted. There are a number of methods by which this cooling may be effected. Stimulated by the energy of Mr. E. L. Aderhold, State Traveling Cheese Instructor, the possibility of utilizing the lower temperature of the sub-soil and of the ground water have been put to a practical test at a number of factories in this state,

with very gratifying results. Referring again to the papers which you hold, there will be found figures with foot-notes as presented in the Wisconsin Experiment Station Bulletin, No. 70, by Prof. F. H. King.

These cuts show various types of available methods applicable to the different conditions found in different sections of this state. In Figure 4 is shown a section of a cheese curing room and horizontal multiple sub-earth duct, made of 13 lines of 6-inch drain tile, laid in two tiers. This duct is 104 feet in length, placed 12 feet below the surface of the ground.

Quoting from Professor King in the bulletin referred to, we find the following:

"Only the lower lines of tile have the greatest cooling effect, because these are in the closest contact with the coldest soil. The lines of tile above the bottom are nearly cut off from the cold ground below by the air-spaces formed by the lower lines of tile, and the soil above them is relatively warm both from the heat brought in by the air and that coming down from above.

"Instead, therefore, of using thirteen lines of 6-inch tile in two or three tiers, one above the other, a single row of larger tile is likely to give as cool air and not to impede the flow of air so much. I should recommend, therefore, for the horizontal sub-earth duct 12 feet below the surface, either three rows of 10-inch drain tile or five rows of 8-inch tile, 100 feet long.

"If the digging is done by hand and it is not desired to remove so much dirt, then the trench may be dug narrower and a foot or two deeper and the tile placed one above the other. As each line of tile will be in direct contact with the cold earth on both sides, an even better cooling effect will be produced than where the tile lie side by side at a higher level."

BOILER AND GENERAL FITTINGS.

I believe it to be false economy to equip a cheese factory with the self-heating vats. I know of several small factories which get along admirably with such apparatus, but a steam boiler, properly insulated on the outside, requires less labor in firing, insures more uniform and exact temperature in the cheese vats, and, best of all, provides the operator with live steam and hot

water for cleaning purposes. The cheese maker with a high appreciation of cleanliness and a due regard for lessening his daily labors will, I think, agree with me that the boiler and engine are hardly to be dispensed with.

In the matter of vats, they should be equipped with large gates and some sort of convenient tilting device, affording an easy and rapid means of tilting and draining.

Automatic curd agitators are a necessity. The "agitator" is superior to hand labor for the following reasons: 1st, the curd is kept in constant motion from one end of the vat to the other, allowing it to cook more evenly than when stirred by hand; 2d, by this process of gentle and constant stirring the curd is not crushed or squeezed, thereby securing an increased yield of cheese, and of superior quality; 3d, the saving of labor whereby one man can perform the work of two or three when two or more vats are used; 4th, that without any further expense the machinery which runs the agitator also pumps the water and supplies the power for the curd mill.

One of the most important auxiliaries in cheese making is the curd sink, supplied with racks. One prominent Canadian cheese buyer has said that a large share of the success achieved by Canadian makers was due to its use. It should be supported on legs with castors. In no other way can the work of draining, milling, airing, and salting be accomplished so easily and perfectly as in the sink. In the purchase of a curd mill, do not make the mistake of buying any of the peg mills now on the market. Secure a knife mill easy of operation and simple of construction, one that cuts the curd into uniform cubes and does not tear or mash the curd, working injury to both the texture and the yield of the cheese.

In the selection of a gang cheese press, it ought always to be a continuous pressure. The adjustable steel frame in which the side rails are laterally movable has distinctive features which up-to-date cheese makers will appreciate. Crooked cheese are an impossibility in this form of press. Hoops are not subjected to the severe side strain due to "bulging" and will wear longer. The diameter of cheese can be changed without having to reconstruct or change the frame or to buy a new press.

There are a host of tools of minor importance, convenient

about a make room, but the description of which would be so long that it is better not to mention them in a paper of this kind.

Every cheese factory should have a sterilizer and dry room. This can be most economically located near the boiler where the heat of the boiler will serve to dry the utensils. The sterilizing oven will be found very serviceable in the proper cleansing of starter-cans, pails, dippers, faucets, etc., etc.

A power force pump will save time and many a back-ache, and when supplied with hose connections may be of inestimable worth in case of fire. To those makers who delight in a neat, clean factory, the power pump equipped with hose of sufficient length to admit of moistening down the drive about the factory before the arrival of the morning milk wagons, will be much appreciated. Five minutes' work with hose and cold well water on a hot, dusty drive around the factory will prevent dust and dirt from blowing into the building and upon the utensils, and at the same time tend to freshen and cool the atmosphere in and about the building.

WHEY TANK.

The whey tank should be lined or made of galvanized iron in order that it may be kept clean and sanitary. It should be constructed above ground at considerable distance from the factory; equipped with sewer connections so that it can be drained and washed out daily. To do away with a breeding place for flies and to prevent rain, dirt and dust from entering the whey, a good tight cover should be provided. Make this cover in halves, on hinges fastened to a center piece, so that each side can be opened towards the center of the tank. A skim-milk weigher will facilitate an equal division of the whey and tend to keep the surroundings clean and free from the mud hole so often found in front of the tank. The whey should be scalded to keep it sweet and the tank scrubbed and steamed daily. The ground surrounding the tank ought to be paved in such a way that the drip, if there be any, will pass off into the sewer.

BATH ROOM AND OFFICE.

Last, but not least, the factory to be complete should have a bath room and office. A room four by eight feet just off the

office room, with a floor of galvanized iron and a bath tub equipped with hot and cold water, is a most desirable thing to have.

Cleanliness is a virtue practiced almost universally throughout the animal kingdom; the only exceptions we can think of just now are the swine, some dairymen and a few cheesemakers. Personal cleanliness on the part of the maker becomes a mark of distinction before the patron and aids in increasing the cheese maker's honor.

I have often heard factory proprietors complain that the cheesemaker did not keep up his books and records of the factory's business in a neat and orderly manner. No man should expect scientific and scholarly book-keeping of one forced to balance the flat side of a cord wood stick over the corner of a vat to suffice for a writing desk.

The modern cheesemaker is a business man and should have the conveniences usually accorded a man of that profession. Give him a small, light, airy room away from the heat and noise of the factory proper, fitted up with a desk or writing table and an easy chair. It will prove a good investment.

Do not put a bed in this office room for your unmarried cheese maker. Secure a decent boarding place for him. Do not build living rooms over any part of the factory or adjoining any side of it for your married cheesemaker. Provide a decent house for him, situated conveniently near to his work.

He labors for you seven days in the week for which it is said the Lord has no mercy on his soul. If this be true, he is surely entitled to some of the comforts of this life. He should have a home so that he may rest, improve his morals, keep a clear conscience, retain the respect of his neighbors, secure a competency of this world's goods and thus live to a good old age.

DISCUSSION.

Mr. Van Leeuwen: Is a galvanized iron whey tank very satisfactory?

Mr. Baer: I do not know what the life of the galvanized iron whey tank is, but I do know that so long as they last, they are more sanitary and more easily kept in condition than wood.

Mr. Van Leeuwen: I haven't found them near as cheap as a good tin whey tank, because they will not last with us. Of course, if we kept the whey perfectly sweet, it might be different, but in some cases it will get a little sour. We elevate all our whey, and pasteurize it. We have been using our old vats. They commence to leak a little bit, and we mend them and elevate them and use them for whey tanks, and put new vats into the factory. I believe that the galvanized tank is not a success, they do not last more than two or three years, and a tin tank will last a long time.

The Chairman: It is a good one if it does last two years, if you use it the year around.

Mr. Baer: I do not know what kind of galvanized tanks you people buy. We have galvanized tanks at the Wisconsin Dairy School that have been used for whey and skim milk for the last ten years, and they are still in first class condition. I think they have cost us thirty-five cents to solder up one hole a couple of years ago, and I know of several galvanized iron tanks, properly taken care of in different cheese factories, that have been standing three, four, five and six years. My experience among the cheese factories of Wisconsin has taught me that it requires considerable work to keep a wooden tank in a cleanly condition, and makers are apt to let them get pretty bad and they leak more or less, especially in the spring of the year when only a little whey is run into the bottom of the tank for a week or ten days. They neglect to tighten the hoops or to caulk up the seams at the top of the staves, and there is more or less whey all around the outside of the tanks.

Mr. Alvis: Would you prefer a tank for water works, or just a force pump for the water supply of a factory?

Mr. Baer: Oh, I should prefer a tank to a force pump, an

elevated tank. I should want some sort of a power pump to get the water into the tank.

A Member: Would an underground curing room under an ice house be a good plan?

Mr. Baer: I think I would prefer to have it above ground.

Mr. Aderhold: I know of some cases where the room is simply divided and one side of the partition has the ice in it and the other side has the cheese. There is an opening at the top and the bottom of the partition and the cool air goes through the lower opening, and the warm air works back through the upper one.

Mr. Swingel: I have an ice house connected with the west side of my curing room and I do not find any benefit as far as cooling the curing room unless I put ice in the curing room. My ice house holds about thirty tons.

Mr. McCready: Mr. Swingel has a shelf in his curing room which he fills with ice every day. He is handy to the Wisconsin river. He keeps his room cool by having this ice rack.

Mr. Wallace: Which is preferable, to put in weighers for the whey or let the farmers help themselves?

Mr. Baer: I think some sort of a scheme, milk pump or weigher, facilitates an equal division of the whey and stops controversy among the patrons in that respect and keeps things in a more cleanly and sanitary condition. Of course, I mean one that works correctly.

Mr. Wallace: What can they be gotten for?

Mr. Baer: Check pumps, I think, are sold for about $50 each.

Mr. Alvis: Suppose a patron has lots of milk and he doesn't care for the whey, so that there is some left, what would you do with it?

Mr. Baer: I would have sewer connections with the whey tank and let it run out every day. I would put in the septic sewerage system, and let it run off as far from the factory as I could get it.

Mr. Alvis: Do you think that system would take up all the whey that would not be taken home in the best season of the year?

Mr. Baer: I never had any experience with a cheese factory where the patrons left much whey. As a rule, it is short.

Mr. McKinnon: I want to tell you what I did this summer, and it gave the best satisfaction to my clients of anything I ever did, and that is, I built over my whey tank a little building, so that when a man stands there and pumps his whey he is protected from the weather, and also his wagon. I have built up a wind-break about ten or twelve feet high, so that the horses are protected by it. It didn't cost much, but it has caused every man to smile when he came to the factory and saw how it worked.

Mr. Alvis: Did they take any more whey?

Mr. McKinnon: I think very often they did take more whey.

Mr. Aderhold: I was at one factory last summer where they had an old cheese vat beside the whey tank. They had no tile drainage of any kind, and every day the whey tank was cleaned out and the washings were put over into the little tank beside it and when that was filled up pretty well, somebody would pump it into barrels and haul it away, and I suppose they dumped it onto somebody else's land, but at any rate it was a good way to keep the whey tank clean and to prevent any bad smell around the factory.

Mr. Baker: How do you prevent these whey tanks freezing in the fall of the year?

Mr. Alvis: It would be a good idea to put a building over it and a stove in it.

Mr. Aderhold: You might put in a furnace.

Mr. Wallace: I kept my whey tank out till Christmas, and it never froze.

The Chairman: In case it is elevated, it might be necessary to put a stove under it. Where it has been heated up pretty well, or pasteurized, it doesn't freeze very much.

THE WISCONSIN CHEESE MAKERS' ASSOCIATION AS AN EDUCATOR.

R. A. MURRAY, YUBA, WIS.

Does it pay to attend as an Educator? Does it pay to attend? Well, that depends on varied circumstances. Since men can profit by what they read and more by experimenting, while others never profit either by their own work or by the knowledge of others.

It is a fact, or at least I consider it so, that at least nine out of ten cheesemakers in the United States who make cheese for a living do not provide themselves with books or attend conventions or institutes to learn or attain a knowledge of other makers' success as it is related here in this convention.

This is the day of scientific, practical cheese making, and no cheesemaker is thoroughly successful unless he keeps in touch with modern methods, and avails himself of the results of investigation and experiment.

The cheesemaker who is satisfied to go on in the old way is the man who is continually in trouble and has no use for this convention; he is the man whose goods are of an inferior quality and bring a low price in the market, and the man who generally "gets the worst of it" year in and year out.

Yes, he comes here chuck-full of trouble in his chosen calling in life, laying all blame on his patrons for bringing poor milk to his factory when he is not a competent judge, or at least I consider it that way, or he would return the impure milk.

Now, here is the place for the different cheesemakers to exchange ideas, not in the field of labor when he is called upon by his patrons to regulate matters and make an article that will bring a first class price in the market. He come here, or should come here, to attain that knowledge of other practical cheese makers' experience of manufacturing and marketing that article to the best advantage for the patrons, and the country at large.

This convention reminds me of my younger days when I drove for miles to attend teachers' institutes, which are acknowledged by all nations to be a necessity to those of that calling and

who we might say are the ones who were the cause of placing in our histories the names of our generals, statesmen, poets, orators, and all our great men of the past and present.

It is the successful man who attends meetings of this professional calling and exchanges ideas with his contemporaries, that succeeds in this world.

If there are difficulties he is laboring under, by his attending this convention, he may receive knowledge which may remedy his troubles, and also may impart knowledge to others who may some day be in the same field of trouble.

Brother cheesemakers, I will assure you that the time I have spent at these conventions has been very profitable to me. I can well assure you I have never attended a convention in my life without attaining knowledge on some point in the care and manufacture of cheese, and all matters pertaining to dairy interests, and I think there are none of us who know too much along this line.

Now, gentlemen, don't be afraid to ask questions at these conventions. It is for that purpose these conventions are gotten up.

DISCUSSION.

Mr. Phillips: There is no chance for any criticism of that paper, but in all the work that has been done in Wisconsin and other states, that is, all the experimental work to uplift and help the people, the hard thing to do is to get the people who need that information in touch with this work. It is not the people who attend these conventions that need it as a rule, but those who stay at home and think they know it all.

TREASURER'S FINANCIAL REPORT FOR 1903.

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.

1903.		
Jan. 11.	Balance in hands of treasurer	$231 52
Jan. 11.	Memberships	283 00
Jan. 16.	From state treasurer	400 00
May 14.	Borrowed money	200 00
July 24.	From state treasurer	200 00
Dec. 30.	Louis F. Nafis & Co.	10 00
Dec. 30.	Chr. Hansen's Laboratory	10 00
Dec. 30.	Monarch Refrigerating Co.	10 00
Dec. 30.	The Preservaline Mfg. Co.	10 00
Dec. 30.	J. & M. Steiner	10 00
Dec. 30.	Worcester Salt Co.	10 00
Dec. 30.	Sturges & Burn Mfg. Co.	10 00
Dec. 30.	Francis D. Moulton & Co.	10 00
Dec. 30.	Creamery Package Mfg. Co.	25 00
Dec. 30.	Republican Hotel	10 00
Dec. 30.	Sharples Separator Co.	10 00
Dec. 30.	Wells, Richardson Co.	10 00
Dec. 30.	Diamond Crystal Salt Co.	10 00
Dec. 30.	E. A. Roser & Co.	10 00
Dec. 30.	David Muir & White	25 00
Dec. 30.	Wis. Dairy Supply Co.	15 00
Dec. 30.	A. H. Barber	10 00
Dec. 30.	M. H. Fairchild & Bro.	5 00
Dec. 30.	J. B. Ford Co.	10 00
Dec. 30.	De Laval Separator Co.	10 00
Dec. 30.	Colonial Salt Co.	25 00
Dec. 30.	A. J. Decker	5 00

Dec. 30.	John Muir	5 00
Dec. 30.	A. H. Barber Produce Co.	10 00
Dec. 30.	Dundas Wooden Ware Co.	10 00
	Total receipts	$1,599 52

Disbursements.

1903.		
Jan. 10.	T. B. Miller, traveling expenses	$6 00
Jan. 11.	Republican Hotel, board bill of speakers	122 28
Jan. 15.	Schwaab Stamp & Seal Co., 500 badges	50 12
Jan. 15.	Prof. H. H. Dean, traveling expenses	50 12
Jan. 16.	J. B. McCready, expenses attending convention	3 26
Jan. 21.	Mrs. A. L. Kelly, reporting	100 00
Jan. 21.	Mrs. A. L. Kelly, expenses attending convention	6 00
Jan. 21.	Miss Effie Clast, typewriting	4 00
Jan. 21.	Drafts and postage	12
Jan. 22.	Thomas Johnston, expenses at Chicago	25 00
Jan. 23.	M. McKinnon, expenses attending convention	8 00
Jan. 24.	Bank draft	10
Jan. 24.	Postage on letters	1 00
Jan. 24.	Benkendorf's note, with interest	71 00
Jan. 24.	Miss Anna Moore, typewriting	2 00
Jan. 24.	Western Passenger Association	44 75
Jan. 24.	J. K. Powell, expenses attending convention	6 00
Jan. 24.	W. C. Dickson, expenses attending convention	4 25
Jan. 25.	Express, freight, drayage, telegrams, expenses at meeting	25 82
Jan. 26.	Miss Anna Moore, typewriting	2 10
Jan. 26.	Prof. W. H. Woll, expenses attending convention	7 44
Jan. 26.	U. S. Baer, traveling expenses	7 46
Jan. 26.	Walter Mayer, printing programs	60 50
Jan. 26.	Express on reports	2 65
Jan. 26.	J. W. Cross, expenses (supt. cheese exhibit)	5 14
Jan. 27.	Miss Effie Clast, typewriting	60 50
Jan. 27.	Miss Effie Clost, typewriting	4 00
Jan. 27.	Postage on letters	34
Jan. 28.	Walter Mayer, printing	1 50
Jan. 28.	Miss Anna Moore, typewriting	3 85
Jan. 29.	Express, postage	1 32
Jan. 29.	Walter Mayer, printing	7 50
Jan. 29.	F. A. Averbeck, 12 medals	56 00

Jan. 30.	Expenses of secretary's office	8 10
Feb. 18.	M. McKinnon, cheese	4 37
Feb. 18.	Jacob Frechter, cheese	1 84
Feb. 20.	U. S. Baer, postage on letters and reports	2 10
Feb. 20.	Typewriting, letters and resolutions	3 08
Feb. 22.	Postage on reports, $.60; letters, $1.40	2 00
Feb. 24.	Pro rata premium fund paid out	99 94
Feb. 24.	Walter Mayer, printing	5 80
Mar. 3.	Walter Mayer, printing	6 10
Mar. 3.	Postage, 580 letters	5 80
Mar. 21.	Postage, 60 letters	1 20
Mar. 25.	Reports and letters, postage	80
April 1.	Miss Anna Moore, typewriting	1 25
April 9.	Walter Mayer, printing	1 50
May 9.	U. S. Baer, traveling expenses	3 75
May 14.	Karlen's note, with interest	104 80
May 18.	Postage, secretary's office	1 00
May 18.	J. K. Powell, traveling expenses	9 00
May 18.	E. L. Aderhold, traveling expenses	4 75
June 1.	J. K. Powell, traveling expenses	9 00
June 1.	E. L. Aderhold, expenses at Madison	7 00
June 24.	John Luchsinger, traveling expenses	4 75
June 24.	U. S. Baer, traveling expenses	3 26
June 24.	John B. McCready, traveling expenses	22 20
June 28.	E. L. Aderhold, traveling expenses	4 75
July 10.	John B. McCready, 4 checks, postage	28
July 20.	Postage on 550 copies annual report	46 40
July 25.	John B. McCready, checks and postage	12
Aug. 6.	Itemized bill, expenses of secretary's office	3 36
Aug. 6.	Madison Democrat, two half tones	10 42
Aug. 6.	Walter Mayer, printing	12 10
Aug. 6.	Postage on 520 reports	31 20
Aug. 19.	Edgar Lepley, cheese	3 99
Oct. 20.	Boxes, hauling, express, freight on 1,500 reports	10 60
Oct. 26.	Boxes, hauling, express, freight on 1,100 reports	16 10
Dec. 1.	John B. McCready, checks and postage	62
Dec. 31.	U. S. Baer, itemized bill, expenses of secretary's office	83 82
	Total disbursements	$1,231 04
	Balance in hands of treasurer	368 48
		$1,599 52

President Powell: 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 conventions that we have ever had. I trust next year we will be able to double our number. I hope to see all the familiar faces and as many more as we have had this year when we again meet one year hence. Our business for this year is now over, and I declare this convention adjourned sine die.