Fourteenth annual meeting of the Wisconsin Cheese Makers' Association held in the Convention Rooms, Republican House, Milwaukee, Wisconsin, Wednesday, Thursday and Friday, January 3, 4 and 5, 1906. 1...

Wisconsin Cheese Makers' Association
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OFFICERS OF THE CHEESE MAKERS' ASSOCIATION.

FOURTEENTH ANNUAL MEETING

OF THE

WISCONSIN

Cheese Makers' Association

HELD IN THE

Convention Rooms, Republican House, Milwaukee, Wisconsin, Wednesday, Thursday and Friday, January 3, 4 and 5, 1906.

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

1906.

LETTER OF TRANSMITTAL.

Office of the Secretary,
Wisconsin Cheese Makers' Association,
Madison, Wis. 1906.

To His Excellency, James O. Davidson,
Governor of the State of Wisconsin:

I have the honor to submit the fourteenth 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 3–5, 1906.

Respectfully submitted,
U. S. BAER,
Secretary.

OFFICERS, 1906.

President:—

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

Vice Persident:—

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

Directors:—

Three Years—F. J. KARLEN ..... Monroe, Wis.
Two Years—J. W. CROSS ..... Mauston, Wis.
One Year—J. GROOTEMONT ..... Brillion, Wis.

Teasurer:—

F. MARTY ..... Monroe, Wis.

Secretary:—

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

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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 succesors 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 commitees 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 countersignd 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 to 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 resolution 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 the 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 OF WISCONSIN CHEESE MAKERS' ASSOCIATION, 1906.

A.

Adams, C. R.	Wyoming	Wisconsin
Adams, J. F.	Kewaunee	Wisconsin
Andrist, G.	West Concord	Minnesota
Aderhold, E. L.	Neenah	Wisconsin
Auer, G.	Sabeir	Wisconsin
Aulswede, Chas.	Manitowoc	Wisconsin
Adams, M. J.	Waukesha	Wisconsin
Anderegg, Casper	La Crosse	Wisconsin
Austin, H. E.	Boscobel	Wisconsin
Anderson, George	Loyal	Wisconsin
Ackerman, Joseph	Monroe	Wisconsin
Austin, W. A.	Kewaunee	Wisconsin
Alexander, C. B.	Chicago	Illinois
	(Room 62, 4 Sherman St.)	
Altman, John	Mineral Point	Wisconsin
Andt, Otto	Adell	Wisconsin
Anderson, H.	Sheboygan Falls	Wisconsin

B.

Baer, U. S.	Madison	Wisconsin
Benecke, Henry	Fontenoy	Wisconsin
Blaser, Christ	Brooklyn	Wisconsin
Brinkmann, C. F.	Coon Valley	Wisconsin
Bremmer, C. A.	Plain	Wisconsin
Bergs, Joseph	Edgar, R. F. D. 2	Wisconsin
Baumann, H. E.	Naugart	Wisconsin
Bushman, Geo. H.	Abbotsford, R. F. D. 1	Wisconsin
Burgi, Oscar	Chicago	Illinois.

Baumgardner, David	Barniveld	Wisconsin
Baumgardner, David, Jr.	Barniveld	Wisconsin
Burg, Edgar	St. Anna	Wisconsin
Blessig, L. W.	Milwaukee, 87 Mich. St.	Wisconsin
Bender, Fred	Boaz	Wisconsin
Berg, Julius	Sturgeon Bay	Wisconsin
Bahr, Chas.	New Holstein	Wisconsin.
Beeman, Chas. W.	Viroqua	Wisconsin
Blanck, August, H.	St. Cloud	Wisconsin
Bruhn, Aksel	Spring Green	Wisconsin
Becker, Phil	Hubertus	Wisconsin
Boll, Ernst	Sheboygan.	Wisconsin
Bust, Fred	Caroline	Wisconsin
Benkendorf, G. H.	Madison	Wisconsin
Beller, Chris	Belleville	Wisconsin
Becker, Otto	Lynn	Wisconsin.
Bates, R. R.	Madison	Wisconsin
Biddulph, J. R.	Tiskilwa, R. F. D. 1	Illinois
Brinkman, M. L.	Sheboygan	Wisconsin
Bagley, F. R.	Chicago, 40 Dearborn St.	Illinois
Baker, R. E.	Manawa	Wisconsin
Bachmann, J. F.	Freemont	Wisconsin
Boldt, F. A.	Gibbsville	Wisconsin
Blum, Christ	Hartford	Wisconsin
Bamford, H. J.	Plymouth	Wisconsin
Buittner. K. F.	Clintonville	Wisconsin
Brandt, Aug.	Forestville	Wisconsin

C.

Cranston, P. E.	Soldiers Grove	Wisconsin
Carswell, F. E.	Richland Center	Wisconsin
Crosby, D. S.	Chicago, (201–203 So. Water. St.)	Illinois
Cannon, J. D.	New London	Wisconsin
Cross, J. W.	Mauston	Wisconsin
Cornish, O. B.	Fort Atkinson	Wisconsin
Casper, P. H.	Welcome	Wisconsin
Carver, C. A.	Milwaukee	Wisconsin
Curtin, D. R.	Hilbert	Wisconsin
Cook, Hon. S. A.	Neenah	Wisconsin
Constantine, W. B.	Plain	Wisconsin

Cannon, S. D. ..... Dale ..... Wisconsin
Chaplin, E. Q. ..... Plymouth ..... Wisconsin
Chaplin, H. A. ..... Plymouth ..... Wisconsin
Clute, L. E. ..... Milwaukee ..... Wisconsin

D.

Dohmal, F. W. ..... Cato, R. F. D. 2..... Wisconsin
Dally, Ben H. ..... Milwaukee ..... Wisconsin
Dean, C. J. ..... Seymour ..... Wisconsin
Decker, A. J. ..... Fond du Lac ..... Wisconsin
Dassow, R. P. ..... Sheboygan Falls..... Wisconsin
De Haan, Matthew ..... Lineville ..... Iowa.
Drage, G. R. ..... Bonduel ..... Wisconsin
Daughletee, J. B. ..... Granton ..... Wisconsin
Damrow, O. A. ..... Sheboygan Falls..... Wisconsin
Damrow, Edward C. ..... Fond du Lac ..... Wisconsin
Duebner, Otto..... Manitowoc, R. F. D. 3.... Wisconsin
De Land, A. D. ..... Sheboygan ..... Wisconsin
Doane, C. F. ..... Washington, Dairy Division ..D. C.
Dibble, C. A. ..... Milwaukee ..... Wisconsin
Dezotell, Frank A. ..... Madison ..... Wisconsin
Durst, Henry ..... Dodgeville ..... Wisconsin
Dietsch, C. S. ..... Plymouth ..... Wisconsin
Durst, J. W. ..... Dodgeville ..... Wisconsin
Douma, M. G. ..... Cleveland ..... Wisconsin

E.

Elmer, Jacob ..... Browntown ..... Wisconsin
Erbstoeszer, Edmund E. ..... Sheboygan Falls ..... Wisconsin
Erbstoeszer, Edward ..... Sheboygan, R. F. D. 2... Wisconsin
Eizinger, Herman..... Mount Horeb ..... Wisconsin
Elbrecht, D. G. ..... Madison ..... Wisconsin
Elmer, Henry ..... Belleville ..... Wisconsin
Emery, J. Q. ..... Madison ..... Wisconsin
Ehrlich, Otto ..... Sheboygan Falls ..... Wisconsin
Ennisson, J. A. ..... Fond du Lac ..... Wisconsin
Everett, C. H. ..... Racine ..... Wisconsin

F.

Finstad, A. N. ..... Kewaunee ..... Wisconsin
Frazer, George W. ..... Appleton, R. F. D. 5..... Wisconsin

Freund, A. A. ..... Hilbert, R. F. D. 5..... Wisconsin
Freund, W. H. ..... Hilbert, R. F. D. 5..... Wisconsin
Fischer, John ..... Richland Center ..... Wisconsin
Fheatt, H. D. ..... Milwaukee ..... Wisconsin
Failey, Owen ..... Black Creek ..... Wisconsin
Frome, R. L. ..... Howards Grove ..... Wisconsin
Frehner, Carl ..... Darlington ..... Wisconsin
Fulmer, F. B. ..... Chicago ..... Illinois
Falk, Emil ..... Waldo ..... Wisconsin
Fuhrer, Ulreh ..... Hollendale ..... Wisconsin
Fairchild, M. H. ..... Chicago ..... Illinois
French, G. W. ..... Darlington ..... Wisconsin
Fitzgerald, Michael ..... Watertown ..... Wisconsin
Ferrington, Edward G. ..... Greenleaf ..... Wisconsin
Fellenz, Joseph B. ..... Adell ..... Wisconsin
Feunema, John ..... Ondega ..... Netherlands
Flynn, F. A. ..... Baraboo, R. F. D. 5..... Wisconsin

G.

Goltz, Gustave ..... Clintonville, R. F. D. 2... Wisconsin
Gregorins, M. J. ..... Appleton, R. F. D. 4..... Wisconsin
Goodrich, C. E. ..... Lone Rock ..... Wisconsin
Greunke, O. F. ..... Clintonville ..... Wisconsin
Gotter, R. F. ..... Granton ..... Wisconsin
Geimer, L. J. ..... Mishicot, R. F. D. 4..... Wisconsin
Grootemont, John ..... Brillion ..... Wisconsin
Green, R. C. ..... Albion ..... Wisconsin
Gates, C. M. ..... Chicago ..... Illinois
Gerbach, Adam ..... Kiel, R. F. D. 2..... Wisconsin
Gehl, M. C. ..... Milwaukee ..... Wisconsin
Giffin, W. W. ..... Plymouth ..... Wisconsin
Gartman, Chas. ..... Sheboygan ..... Wisconsin
Gartman, F. W. ..... Sheboygan ..... Wisconsin
Gartman, H. C. ..... Sheboygan ..... Wisconsin
Greb, Henry ..... Seymour ..... Wisconsin
Gossling, F. W. ..... Glenbeulah ..... Wisconsin
Goehring, L. B. ..... Cascade, R. F. D. 20.... Wisconsin

H.

Hess, P. W. ..... Hillsboro, R. F. D. 2..... Wisconsin
Hefty, Jacob ..... Belleville ..... Wisconsin

Hannawell, F. C. .....Boaz .....Wisconsin
Haskins, H. J. .....Waupun .....Wisconsin
Hopp, B. .....Sturgeon Bay, R. F. D. 3.Wisconsin
Hangartner, J. J. .....Marion .....Wisconsin
Hoeppner, John .....Marion .....Wisconsin
Hauk, Edward .....Dale .....Wisconsin
Huse, Geo. H. .....Black Creek .....Wisconsin
Herbert, H. E. .....Elkhart, R. F. D. 33.....Wisconsin
Helm, A. B. .....Oshkosh .....Wisconsin
Haese, John .....Brillion .....Wisconsin
Hamm, W. P. .....West Bend, R. F. D. 3...Wisconsin
Homuth, A. E. .....Spring Green .....Wisconsin
Held, Fred .....Mount Horeb .....Wisconsin
Hardiker, Fred H. .....Chicago .....Illinois
(Merchant's Despatch Transportation Co.)
Huhn, H. H. .....Valders .....Wisconsin
Henry, A. E. .....Sheboygan Falls .....Wisconsin

I.

Indermuehle, Carl .....Leroy .....Wisconsin

J.

Johnson, U. L. .....Brandon .....Wisconsin
Johnson, Robert .....St. Thomas .....Canada.
Jordan, Tho. H. .....Barton .....Wisconsin
Joslin, H. C. .....Richland Center .....Wisconsin
Joslin, F. W. .....Richland Center .....Wisconsin
Jones, A. A. .....Fond du Lac .....Wisconsin
Jennings, A. A. .....Chicago .....Illinois
(Room 64, Sherman St.)
Jonely, B. .....Brownsville .....Wisconsin
Johnson, T. L. .....Cambpellsport .....Wisconsin
Janssen, J. H. .....Adell .....Wisconsin
Jordan, H. C. .....Kansas City .....Kansas

K.

Knickerbocker, S. E. .....Wyoming .....Wisconsin
Kunz, F. W. .....Hustisford .....Wisconsin
Kane, James .....Stanton .....Wisconsin
Kapelka, H. F. .....Avoca .....Wisconsin

Kubs, J. J.	Cato	Wisconsin
Koller, F. W.	Alma	Wisconsin
Knappmeller, T. F.	Kewaunee, R. F. D. 7	Wisconsin
Kolpack, Albert	Regina	Wisconsin
Kohli, A. C.	Mayville	Wisconsin
Kraak, C. A.	Muscoda	Wisconsin
Kreul, Geo. W.	Spring Green	Wisconsin
Koopman, A. C. Jr.	Port Washington	Wisconsin
Kneffel, F. B.	Hilbert	Wisconsin
Karlen, J.	Monroe	Wisconsin
Karlen, F. J.	Monroe	Wisconsin
Kust, George	Kewaunee	Wisconsin
Kachel, T. A.	Whitewater	Wisconisn
Kerscher, Frank J.	Manitowoc	Wisconsin
Keller, Edward	Grafton	Wisconsin
Kelty, John	Boscobel	Wisconsin
Kalkofen, H.	Elmhurst	Wisconsin
Kallies, H. A.	Nayda	Wisconsin
Kalk, Herbert A.	Sheboygan	Wisconsin
Kleinhesslink, J.	Cedar Grove	Wisconsin
Kuhaupt, G.	Richfield	Wisconsin
Kalmerton, Ed.	Sheboygan Falls	Wisconsin
Koenigs, M.	Armstrong	Wisconsin
Kirkpatrick, Bruce	Richland Center	Wisconsin
Kaley, Michael	Spring Green	Wisconsin
Kempler, Emil	Lamont	Wisconsin
Konz, Joe	Elkhart Lake	Wisconsin
Koehler, A. C.	Plymouth	Wisconsin
Knudson, P. M.	Cazenovia	Wisconsin
Kielsmier, Otto	Manitowoc, R. F. D. 2	Wisconsin
Koepke, Otto	Kewaskum	Wisconsin
Kapelka, J. A.	Avoca	Wisconsin
Kohli, Christ	Brownsville, R. F. D. 1	Wisconsin
Koskamp, Herman	Oostburg	Wisconsin
Kusel, J. H.	Watertown	Wisconsin
Koeller, C. D.	Clintonville	Wisconsin

L.

Lehnherr, J.	West Concord	Minnesota
Last, B. O.	Luxemburg	Wisconsin
Lichtenberg, Wm.	Woodland, R. F. D. 1	Wisconsin

Lulloff, W. A.	Hilbert	Wisconsin
Leurance, Scott	Yuba	Wisconsin
Larson, H. C.	Dodgeville	Wisconsin
Larson, P. A.	Holmen	Wisconsin
Luenberger, John	Davis	Illinois
Loose, Henry	Hilbert	Wisconsin
Litzky, Chas.	Milwaukee	Wisconsin
La Croix, John, Nic.	Holstein	Wisconsin
Lord, John	Sandusky	Wisconsin
Luethy, A.	Plymouth	Wisconsin
Loabs, A. G.	Medford	Wisconsin
Lord, Frank	West Bend	Wisconsin
Lounsburg, J. M.	Watertown	Wisconsin
Leesebey, Ralph U.	Cecil	Wisconsin
Luchsinger, John Hon.	Monroe	Wisconsin

M.

Meyers, M. H.	Madison	Wisconsin
McCarthy, J. F.	West Concord	Minnesota
Malezewski, J.	Laney	Wisconsin
Mielke, C. W.	Wittenburg	Wisconsin
Mullen, E. J.	Watertown, R. F. D. 1.	Wisconsin
Mrotek, P.	Kewaunee, R. F. D. 4.	Wisconsin
Madding, Wallace	Richland Center	Wisconsin
McManners, H. S.	Melrose	Wisconsin
McAdam, Wm.	Waukesha	Wisconsin
Monrad, J. H.	New York City	New York
Michel, Mat.	Garnet	Wisconsin
Matynick, G. M.	Kiel	Wisconsin
Moore, J. G.	Madison	Wisconsin
McNicholas, Frank	Plymouth	Wisconsin
McKelly, R. C.	Milwaukee	Wisconsin
Maxon, Don	West Bend	Wisconsin
McCormick, Chas. J.	Dodgeville	Wisconsin
McClusky, J. W.	Lyndon	Wisconsin
Meyer, Martin	Madison	Wisconsin
Moser, Joe	Brillion	Wisconsin
Maechtle, A. G.	Port Washington	Wisconsin
Mass, Emil H.	Oostburg	Wisconsin
Mueller, H. L.	Sheboygan Falls	Wisconsin
Meyer, Henry	Darlington	Wisconsin

Mickle, Chas. ..... Gotham ..... Wisconsin
McCready, J. B. ..... Fond du Lac ..... Wisconsin
Meyer, Math ..... New Holstein ..... Wisconsin
Magan, Frank T. ..... Chicago ..... Illinois
(547 Railway Exchange.)
Miller, Geo. ..... Allenton ..... Wisconsin
Marty, Gottlieb ..... Madison ..... Wisconsin
Murphy Morris ..... Chicago, 229 So. Water St. Illinois
Meinhart, Fred ..... Chicago, 253 La Salle St... Illinois
Marty, Jacob ..... Brodhead ..... Wisconsin
Manwaring, A. H. ..... Spring Green ..... Wisconsin
Metz, H. M. ..... Milwaukee ..... Wisconsin
(97 Michigan St.)
Mahlick, M. J. ..... Pilsen ..... Wisconsin
Muehlberg, O. E. ..... Fredonia ..... Wisconsin
Mason, Peter ..... Manitowoc ..... Wisconsin
Mulvey, F. J. ..... Hingham ..... Wisconsin
Miller, Chas. ..... Brownsville, R. F. D. 1.. Wisconsin
McKinnon, E. L. ..... Sheboygan Falls ..... Wisconsin
Moldenhauer, H. R. ..... Lebanon ..... Wisconsin
Marty, Fred ..... Monroe ..... Wisconsin
Moore, J. W. ..... Madison ..... Wisconsin

N.

Noyes, H. L. ..... Muscoda ..... Wisconsin
Noyes, H. J. ..... Muscoda ..... Wisconsin
Nisbet, Wm. ..... Richland Center ..... Wisconsin
Newman, B. W. ..... Madison ..... Wisconsin
Nicolaus, C. A. ..... Waukesha ..... Wisconsin
Nenetz, Emil ..... Kewaunee ..... Wisconsin

O.

Olleman, Sam ..... Monroe ..... Wisconsin
Ouradnik, W. J. ..... Cincinnati, 417 E. Court St.... Ohio
Olson, Bernie ..... Wautoma ..... Wisconsin
Ostenson, Lewis ..... Oconomowoc ..... Wisconsin
Ostrander, J. M. ..... Mineral Point ..... Wisconsin

P.

Plausky, F. A. ..... Kewaunee ..... Wisconsin
Priebe, Henry ..... Kewaunee ..... Wisconsin
Pieper, H. F. ..... Eden ..... Wisconsin

Plett, G. W. ..... Cream, R. F. D. 1..... Wisconsin
Pingel, Otto ..... Chilton ..... Wisconsin
Pickard, Chas. ..... Muscoda ..... Wisconsin
Pingel, E. C. ..... Elkhart Lake ..... Wisconsin
Plaser, Fred ..... Hollandale ..... Wisconsin
Priebe, Henry ..... Logansville ..... Wisconsin
Powell, A. G. ..... Loyd ..... Wisconsin
Possley, N. E. ..... New Holstein ..... Wisconsin
Petrie, John ..... Wayne ..... Wisconsin
Poole, A. C. ..... Darlington ..... Wisconsin
Perren, C. F. ..... Fond du Lac R. F. D. 8.. Wisconsin

R.

Roycraft, A. J. ..... Chippewa Falls ..... Wisconsin
Radtke, A. C. ..... Rib Lake ..... Wisconsin
Riedel, G. C. A. ..... Potters ..... Wisconsin
Rank, Louis ..... Manitowoc, R. F. D. 5.... Wisconsin
Radtke, A. R. ..... Marion ..... Wisconsin
Regez, Jacob ..... Monroe ..... Wisconsin
Regez, Herman ..... Monroe ..... Wisconsin
Regez, August ..... Dodgeville ..... Wisconsin
Regez & Son ..... Monroe ..... Wisconsin
Roth, C. ..... Monroe ..... Wisconsin
Roll, Emil ..... Kekoskee ..... Wisconsin
Reid, J. J. ..... Oconomowoc ..... Wisconsin
Recob, G. R. ..... Richland Center ..... Wisconsin
(R. F. D. 3.)
Rego, B. J. ..... Cazenovia ..... Wisconsin
Regez, Ernest ..... Blanchardville ..... Wisconsin
Regez, Ernest, Jr. ..... Blanchardville ..... Wisconsin
Radel, Ben ..... Richland Center ..... Wisconsin
Rickli, Alfred ..... South Wayne ..... Wisconsin
Roder, John ..... Monroe ..... Wisconsin
Reinhold & Meyer Mfg. Co..... Plymouth ..... Wisconsin
Radloff, Max P. E..... Hutisford ..... Wisconsin
Rankin, G. W..... Whitewater ..... Wisconsin
Ritzke, Joseph..... Chilton ..... Wisconsin
Ritzke, Aug. ..... Chilton ..... Wisconsin
Reineking, F. C. ..... Sheboygan Falls ..... Wisconsin
Ruef, Uhruh ..... Darlington ..... Wisconsin

S.

Storzes, S. .....Stangelville, R. F. D. 2, Wisconsin
Schwingel, E. G. .....Avoca .....Wisconsin
Schmidt, A. F. .....Readfield .....Wisconsin
Strahan, M. E. .....Melvern .....Kansas
Schwingel, F. P. .....Avoca .....Wisconsin
Stucky, E. J. .....Mantorville, R. F. D. 2, Minnesota
Stucky, L. E. .....Pine Island, R. F. D. 3, ..Minnesota
Svetnicka, E. .....Boscobel .....Wisconsin
Schmahl, C. .....Elkhart Lake, R.F. D. 33, Wisconsin
Strassburg, Chas. .....Loyd .....Wisconsin
Steinhoff, Hon. I. W. .....Stratford .....Canada
Schaller, Alex. .....Mount Horeb.....Wisconsin
Sawyer, L. H. .....Loyd .....Wisconsin
Searles, H. C. .....Fond du Lac .....Wisconsin
Sampe, G. C. .....Hilbert .....Wisconsin
Sohrweide, W. M. .....Chilton .....Wisconsin
Stanton, W. O. .....Oostburg .....Wisconsin
Skinner, D. P. .....Milwaukee .....Wisconsin
Schmitt, C. J. .....Byrds Creek .....Wisconsin
Schmitt, Carl .....Burnett Junction .....Wisconsin
Svoboda, Albert .....Forestville .....Wisconsin
Strouf, F. B. .....Mishicott, ...R. F. D. 1, Wisconsin
Schultz, Ernest .....Greenleaf .....R.F. D. 3, Wisconsin
Schmid, Chris. .....Blanchardville .....Wisconsin
Schmitt, J. D. .....St. Cloud .....Wisconsin
Steele, John. .....Oconowowoc .....Wisconsin
Schroeder, Herman .....Greenleaf .....Wisconsin
Schwantes, Otto .....Neillsville. . Star Route, Wisconsin
Steinhart, O. J. .....Luxemburg .....Wisconsin
Scallon, Wm. .....Loreto .....Wisconsin
Swenink, O. H. .....Cazenovia .....Wisconsin
Schaller, Rudy .....Barneveld .....Wisconsin
Smith, O. J. .....Loyal .....Wisconsin
Schenkel, Fred .....Woodford .....Wisconsin
Schneider, Henry .....Stark .....Wisconsin
Schmitt, H. F. .....Byrds Creek .....Wisconsin
Schliffler, Fred.....Standard .....Wisconsin
Schassen, U. J. .....Lake Church .....Wisconsin
Sixel, H. G. .....Cleveland .....Wisconsin
Strahm, C. .....Blanchardville .....Wisconsin

Sobel, Mike .....Grimms .....Wisconsin
Schaefer, P. J. .....Chicago, 201 S. Water St., Illinois
Schladweiler, Ger. .....Whitelaw .....Wisconsin
Siggelko, E. O. .....Cleveland .....Wisconsin
Stemper, Joseph .....Leopolis .....Wisconsin
Strub, Jacob .....Plymouth .....Wisconsin
Sweeting, C. W. .....Manitowoc .....Wisconsin
Speich, Dietrich .....Brodhead .....Wisconsin
Sherwood, Arthur .....Care of International Salt Co., Milwaukee, Wisconsin.
Simon, G. H. .....Kiel .....Wisconsin
Schulte, A. W. .....Colby .....Wisconsin

T.

Theisen, Jacob .....Fredonia .....Wisconsin
Tromner, H. .....Quincy .....Wisconsin
Tess, W. A. .....Tisch Mills .....Wisconsin
Thoni, Mike .....Hollandale .....Wisconsin
Trudelle, S. F. .....Milwaukee, 87 Mich. St., Wisconsin
Thomas, W. C. .....Sheboygan Falls .....Wisconsin
Thiel, John H. .....Potter .....Wisconsin
Turner, Adrian .....Ridgeway .....Wisconsin
Thompson & Wright .....Neenah .....Wisconsin
Trachsel, Albert C. .....Monroe .....Wisconsin
Trester, J. H. .....Sheboygan .....Wisconsin

U.

Ubbelohde, T. A. .....Glenbeulah .....Wisconsin
Urben, Alfred .....Blue Mounds .....Wisconsin
Ubbelohde, Fred .....Glenbeulah .....Wisconsin

V.

Valentine, Mark .....Rose Lawn, R. F. D. 2, Wisconsin
Vogt, John .....Freemont .....Wisconsin
Viste, N. .....Sawyer, F. D. 2, Wisconsin
Vogel, Gottfried .....Mt. Horeb .....Wisconsin
Vogelsang, Wm. .....Timothy .....Wisconsin
Van Duser, J. A. .....Hebron, R. F. D. 2, ...Wisconsin
Vogel, Gottfried .....Mt. Horeb .....Wisconsin
Viergutz, F. A. .....Neilsville .....Wisconsin

W.

Wismer, F. H. ..... Plain ..... Wisconsin
Wheeler, R. P. ..... New Lisbon ..... Wisconsin
Westphal, F. C. ..... Columbus ..... Wisconsin
Wallan, C. H. ..... Milwaukee, 640 Milwaukee Street, Wisconsin.
Waddell, Wm. ..... Hub City ..... Wisconsin
Williams, C. H. ..... Chicago ..... Illinois
Wilkowski, Hugo A. F. ..... Mishicott ..... Wisconsin
Waite, Earl L. ..... Oshkosh, R. F. D. 7..... Wisconsin
Wolfinger, Joseph ..... Dundas ..... Wisconsin
Walter, Fred L. ..... Seymour ..... Wisconsin
Winkler, L. F. ..... Random ..... Wisconsin
Wallace, Pat ..... Hortonville ..... Wisconsin
Ward, J. E. ..... Sandusky ..... Wisconsin
Wolfinger, John ..... Brillion ..... Wisconsin
Weuthrich, Fred ..... Mayville ..... Wisconsin
Weyer, Otto ..... Manitowoc, R. F. D. 2, Wisconsin
Weber, Albert ..... Allenton ..... Wisconsin
Waterstreet, Wm. ..... Spring Green ..... Wisconsin
Warner, J. A. ..... Bensonville ..... Illinois
Wutrich, Gottfried ..... Darlington ..... Wisconsin
Wuerger, W. J. ..... Greenleaf ..... Wisconsin
Winkler, John ..... Merton ..... Wisconsin

Z.

Zingg, Fred ..... Mt. Horeb ..... Wisconsin
Zwieg, Emil, R. ..... Oconomowoc, R. F. D. 25, Wisconsin
Zelm, W. A. ..... Plymouth ..... Wisconsin
Zaug, Fred ..... Gresham ..... Wisconsin

FOURTEENTH ANNUAL CONVENTION

OF THE

Wisconsin Cheese Makers' Association

HELD IN THE
CONVENTION ROOMS, REPUBLICAN HOUSE,
MILWAUKEE WISCONSIN,

Wednesday, Thursday and Friday, January 3, 4, and 5, 1906

PROGRAM.

Introductory Session.

Wednesday, 10 A. M.

Address of Welcome .....

R. B. Watrous, Milwaukee, Wis., Sec'y Citizens' Business League.

Response .....

W. C. Thomas, Sheboygan Falls, Wis., Editor Sheboygan County News and Dairy Market Reporter.

President's Annual Address.....E. L. Aderhold, Neenah, Wis.

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

Report of Treasurer .....Fred Marty, Monroe, Wis.

Report of Board of Directors .....J. Grootemont, Brillion, Wis.

"Some of the Benefits Cheesemakers Derive From Exhibiting Their Products at County, Inter-County and State Fairs.....

.....William Waterstreet, Spring Green, Wis.

"Dairy Field Work".....

H. C. Searles, Fond du Lac, Wis., Traveling Dairy Instructor for Wisconsin State Dairymen's Association.

Appointment of Committees.....

Inspection of Cheese Exhibit.....

Second Session.

Wednesday, 2 P. M.

"The Production of Milk for Cheese Making Purposes.....
.....Lewis Ostenson, Oconomowoc, Wis.

"Cheese Scoring Contests".....

Geo. W. Rankin, Whitewater, Wis., Editor Cheese and Dairy Journal and Creamery Reporter; J. G. Moore, Madison, Wis., Assistant Dairy and Food Commissioner, Secy. Wis. Buttermakers' Association.

"Brick Cheese Making".....Fred Wuethrich, Mayville, Wis.

"Preparation and Propagation of Startoline and Starters".....

Martin H. Meyer, Madison, Wis., Instructor in Practical Butter Making, Dairy School, University of Wis.

A Talk With the Boys.....

J. H. Monrad, New York City, N. Y., Ediorial Staff New York Produce Review and American Creamery.

Address .....

Henry Van Leeuwen, Ottawa, Kansas, Cheese King of Kansas.

Third Session.

Thursday, 9 A. M.

"The Manufacture of Whey Butter".....

Prof. E. H. Farrington, Madison Wis., Director Wis., Dairy School.

"Yeast as a Cause of Gassy Fermentation in Swiss Cheese"....

Dr. H. L. Russell, University of Wis., Madison, Wis., Director Wis. State Hygienic Laboratory.

"Scope of the National Dairy Show".....

E. Sudendorf, Chicago, Ill., Secy. National Creamery Buttermakers' Association.

"Cheap Feeds for Milk Production".....

Geo. Mc. Kerrow, Madison Wis., Supt. Department of Farmers' Institutes.

"Recent Legislation Affecting the Dairy Industry".....

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

Fourth Session.

Thursday, 2 P. M.

Address .....

Hon. Edward K. Slater, St. Paul, Minn., Minn. State Dairy and Food Commissioner.

Address .....

Hon. E. H. Webster, Washington, D. C., Chief of Dairy Division U. S. Dept. of Agriculture.

"Cheese as a Food".....

Miss Emma Conley, Wausau, Wis., Domessic Economy, Marathon Co., School of Agriculture and Domestic Economy.

"The Necessity of More Perfect Co-operation in a Co-operative Business. .....

.....Hon. I. W. Steinhoff, Stratford, Canada.

Fifth Session.

Friday, 9 A. M.

"Cheese Problems That Can Be Profitably Investigated".....

Prof. C. A. .Doane, Washington, D. C., .Dairy Expert, U. S. Dept. of Agriculture

Address .....

Robert Johnston, St. Thomas, Ontario, Canada, with the A. F. Mac Laren Imperial Cheese Co.

"The Benefits of a Thorough System of Instruction in the Manufacture of Cheese".....

.....Hon. I. W. Steinhoff, Stratford, Canada.

Final Session.

Discussion—"Whey Disposal," "Handling of the Whey".....

.....John Grootemont, Brillon, Wis.

.....J. M. Flischman, Campbellsport, Wis.

.....F. E. Carswell, Lone Rock, Wis.

Dairy Expert, Wis., State Dairy and Food Commission.

"The Needs of the Swiss Cheese Industry in Wisconsin".....

Carl Marty, Brodhead, Wis., Former Editor, German Department of the Cheese and Dairy Journal and Creamery Reporter.

"The Monolith Flooring Material for Cheese Factory Purposes"

.....The American Monolith Co., Milwaukee, Wis.

PREMIUMS.

CHEESE EXHIBIT.

Medals.

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

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

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

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

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

Every exhibitor whose cheese scores 90 points and above will receive a dilpoma 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 92 points and above. 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 meetng in person, wll in no instance be awarded a medal.

This educational contest is open to the world. Mr. J. D. Cannon and Mr. Fred Marty have 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, they 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.

Superintendent:

J. W. Cross, Mauston, Wis.

Judges:

Hon. I. W. Steinhoff, Stratford, Canada.

D. S. Crosby, Chicago, Ill.

Oscar Burgi, Chicago, Ill.

RULES.

Cheese Exhibit.

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 twenty 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.

Eenry blanks and shipping tags 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 ctiy not later than December 30th, 1905.

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 commercial cases. In no instance will an exhibit of less than twenty pounds be permitted to enter in competition for medals and the pro-rata premium fund. Cheese weighing less than twenty pounds singly, should be exhibited two or more in a box. Daisies, Young Americas, Prints, etc., should be exhibited in lots equivalent to twenty pounds.

Upon receipt of cheese at the exhibition hall, all tags, cards and markings will be removed by the Superintendent, and will be sub-

stituted by entry cards of the Association, designating number of entry.

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

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

The cheese scoring the highest number of points in the gold medal classes will be retained as the property of the Association to be cut up and distributed to those present, 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.

Scale of points for judging American cheese:

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

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

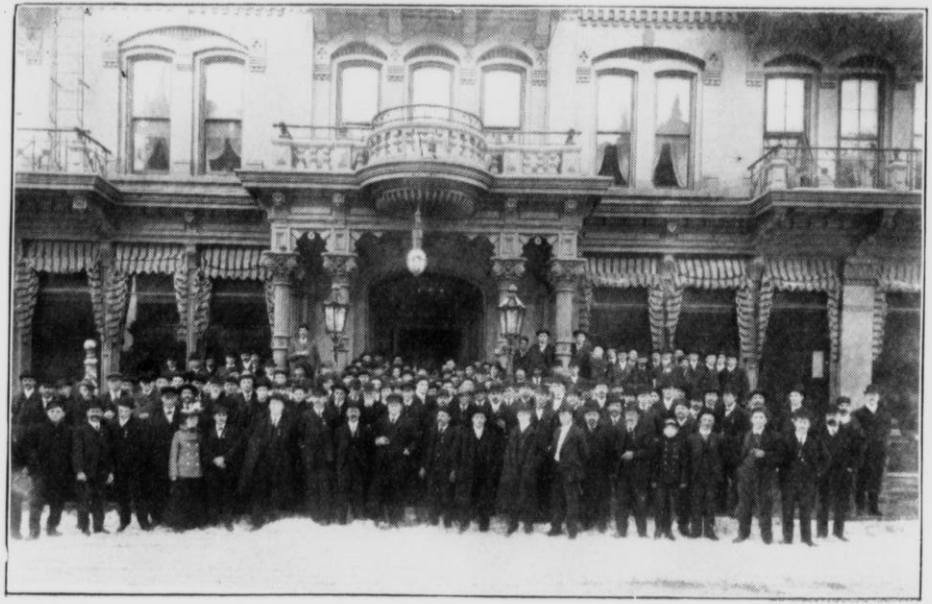
Flavor	35
Appearance on trier (holes)	30
Texture	20
Salt	10
Style	5
Total	100

Brick and Limburger cheese will be scored on a scale of 100 as follows:-

Flavor	40
Texture	40
Color	10
Salt	5
Style	5
Total	100

LIST OF CONTRIBUTORS.

Creamery Package Mfg. Co., Chicago, Ill.
Wisconsin Dairy Supply Co., Whitewater, Wis.
David Muir & White, Fond du Lac, Wis.
Republican House, Milwaukee Wis.
Brllion Woodenware Co., Brillion, Wis.
De Laval Separator Co., Chicago, Ill.
Frank L. Jones, Utica, N. Y.
Sturges & Burn Mfg. Co., Chicago, Ill.
Monarch Refrigerating Co., Chicago, Ill.
Wagner Glass Works, New York, N. Y.
Continental Cereal Co., Peoria, Ill.
Chr. Hansen's Laboratory, Little Falls, N. Y.
E. A. Roser & Co., Chicago, Ill.
A. H. Barber & Co., Chicago, Ill.
J. B. Ford Co., Wyandotte, Mich.
A. Booth & Co., Chicago, Ill.
Heller Chemical Co., Chicago, Ill.
Burroughs Adding Machine Co., Milwaukee, Wis.
A. H. Barber Cry. Supply Co., Chicago, Ill.
International Salt Co., Milwaukee, Wis.
Golden & Co., Washington, D. C.
A. J. Decker, Fond du Lac, Wis.
Sheboygan Co., News & Dairy Market Reporter, Sheboygan, Wis.
Cornish, Curtis & Green Mfg. Co., Ft. Atkinson, Wis.
Diamond Crystal Salt Co., St. Clair, Mich.
H. B. Ellsworth, Excelsior, Wis.
Colonial Salt Co., Akron, Ohio.
Northwestern Cry., Mutual Fire Insurance Co., Juneau, Wis.



DELEGATES AT THE CHEESE MAKERS' ASSOCIATION.

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS

OF THE

Wisconsin Cheese Makers' Association

Fourteenth Annual Meeting, 1906.

The meeting was called to order at 10 a. m., January 3, 1906 by President E. L. Aderhold, the president using for that purpose a brand new gavel which had been theretofore presented to him with a neat little speech by Col. B. H. Dally, on behalf of Cornish, Curtis & Green of Fort Atkinson.

The Chairman: The convention will please come to order. In behalf of the association, I accept this gavel with pleasure. This association has been favored by the supply men from its beginning, and it is yet, and I hope will be in the future. While we have felt all the time that we have had the supply men with us, we appreciate the esteem and the friendliness shown for us in this manner.

This piece of wood looks as though it sometime grew some hickory nuts, and in its present form it can be used in preventing the springing of chestnuts. Col. Dally has tendered some taffy to your president. I want to say there isn't much of any substance in taffy, it doesn't cost anything and yet we all ap-

preciate it; it ought to be used and distributed more freely than it is; it is better than epitaphy, it gives us encouragement to continue the work that we are in. I hope that by the judicial use of this gavel, Col. Dally, that our discussions will never need to dally. Thank you.

Now, you all know what the purpose of this meeting is. We have a program and we are going to keep right along working at it.

The first on the program is the Address of Welcome, by Mr. R. B. Watrous, the secretary of the Business League of Milwaukee.

ADDRESS OF WELCOME.

R. B. Watrous, Milwaukee, Wis., Secy. Citizens' Business League.

Mr. President, Ladies and Gentlemen of the Wisconsin Cheese Makers' Association: It was my pleasure and I considered it good fortune a year ago to extend to you a welcome to Milwaukee on behalf of the Citizens' Business League and the great body of business men that that organization represents. I want to confess to you that I was glad to be asked to perform the same service again this year for we take particular pride in welcoming to Milwaukee the Wisconsin Cheese Makers' Association. The fact is, we would not really consider the convention year in Milwaukee opened up right if we did not welcome as the first association of the season, the cheesemakers. You have been starting off our convention calendar for the last four years and it has always meant that a splendid convention has been held in Milwaukee when the cheesemakers meet here, and it has been a forerunner of a long list of splendid meetings of organizations of the state and from other states.

We trust that your stay here with us this week will be as pleasant and pleasanter than in former years in Milwaukee.

I might be tempted to apologize a little bit for the weather this morning, and to assure you that the weather was going to turn out just right within a few hours, but I am not going to do it, because last fall I monkeyed with the weather proposition and got myself into a lot of trouble. We welcomed an

association here in August, and there was a light fall of rain, and in a facetious way I told our visitors that that was merely a little pleasantry of the weather man, he had merely sent that fall of rain to lay the dust and prepare for a fair week for them, and I assured them the rain would stop that day at eleven o'clock. It did not stop at eleven o'clock, nor the next day nor the next, and I finally had to leave town, because I could not make good on that promise; the weather man went back on me, and I am afraid to trust him ever since.

But whether we have rain or not, I know you are going to have a profitable and pleasant business session here and I hope you will have a great deal of enjoyment, because you have a lot of pleasant fellows, like Mr. Dally, who will help to make your stay pleasant.

Your president has been presented with a gavel. I know he is not going to have to use it to create order out of discord. This big crowd of cheesemakers doesn't know what discord is, so, Mr. President, I know from past experience you are going to have a harmonious meeting.

You have a great deal at this time to be thankful for. I am told that you have had one of the most profitable years in your business in all dairy lines in the state of Wisconsin in the history of the dairy business, and that Wisconsin now stands as the leading state of the Union in the number of its dairies, among its greatly diversified interests.

So we are glad to congratulate you on your profitable year and we know that in your coming together at this time to discuss methods, you are going to get results which will benefit you in the continuance of your business.

We welcome organizations of this character, which come here for educational purposes; we know that you are a great and important part of our commonwealth of Wisconsin than which there is no greater in the whole United States, because of its diversified industries.

Milwaukee has been making progress during the past year; it has been a strenuous year, but we know that Milwaukee stands higher today in the estimation of the citizens of all the towns, hamlets and cities of the state of Wisconsin than ever before. You know it is a city on which you can depend financially, in which you can trust its citizens, individually and collectively, and we trust that you will always regard Milwaukee, in addition to its being the metropolis of the state, as a

place which you will be glad to visit to do your trading and buying in, other things being equal. We want a cheeseman when he starts in his factory to turn to Milwaukee as one of the leading places to come to for the purchase of his machinery and supplies, other things being equal.

We have made great progress in our manufacturing industries. A year ago I reported to you that the value of all of the manufactured product aggregated a total of $265,000,000. We have made a gain of $20,000,000 upon that amount during the past year.

Another indication of the growth of the city is the extent of its building operations. Milwaukee citizens as the owners of big factories and as the owners of homes have spent more money the past year in the erection of factories and homes than ever before, and our jobbing trade has increased in the same ratio, the total sales for the year 1905 aggregating the great total of $402,000,000.

The country produce sold in Milwaukee last year aggregated the total of $82,000,000. The total value of Milwaukee manufactures in the jobbing trade was $194,000,000, so that we are not only making our own products here, but we are handling products which come from the farms, the cheese factories and dairies and every other industry represented through our great state.

We believe that we are to be congratulated in the advance we have reached, as you are to be congratulated in the proportions which your business has attained.

As I said a year ago, we hope that the Cheese Makers' Association will, for a great many years to come, be the association to start off our convention season, and on behalf of the Citizens' Business League and the industries and interests represented by that association, I again tender you a most cordial invitation to our city next year with the assurance that you will be courteously received whenever you may appear, and we hope that when you are not engaged in the serious business of your sessions, you will make it a point to visit our stores, to visit our art gallery and museums, our theatres, to spend a week which will be one of pleasure and make you return to your homes with the pleasantest recollections of the magnificent metropolis of our great state of Wisconsin.

RESPONSE.

W. C. Thomas, Sheboygan Falls.

Editor Sheboygan County News and Dairy Market Reporter.

When I started from home my wife said, "For Heaven's sake, Will, if you attempt to make any impromptu remarks down there, try and speak at least a dozen words without swearing," so you will pardon me for reading what I have to say.

Mr. President, Representative of the Citizens' Business League, and Citizens of Milwaukee: There is a long program of important work laid out for this annual meeting that will require more than the allotted time to perform to the best advantage, therefore I will be brief.

The very hearty welcome that you have just extended to the Wisconsin Cheese Makers' Association ought to make every one of its members feel thoroughly at home here and I believe it does.

I do not know why I should have been invited to respond to this address of welcome, when there are so many cheesemakers better able to have done so, nevertheless I feel proud to have the privilege of thus serving so distinguished a body of co-workers in an industry that has developed into such vast importance in the state of Wisconsin, as to attract the attention of the entire world.

The cheesemakers of Wisconsin are proud of the enterprise and thrift of the state's metropolis and appreciate its generous hospitality. They have met here so many times and have been treated so well, that they like it and feel that that good old Milwaukee town is a safe place to meet and get in touch, without being "touched."

I also feel confident that Milwaukee recognizes the important position the cheese industry holds in this great commonwealth of Wisconsin and is inclined to give due credit to those earnestly engaged in its development.

In behalf of this association I extend most gracious thanks to the city of Milwaukee for her hearty greeting and trust she will have no occasion to make complaint of "short weights," after we have delivered the goods and returned home.

I thank you.

PRESIDENT'S ADDRESS.

E. L. Aderhold, Neenah, Wis.

The first of the articles of incorporation of this Wisconsin Cheese Makers' Association set forth the purposes of this Society.

Past efforts in carrying out these purposes have been fruitful, but the fact that much more work along these same lines is necessary was forcibly impressed on your president who, during the past season, officially inspected over four hundred factories and discussed the shortcomings with the operators thereof.

In this work many factories were found that were incomplete in equipment; many that needed better floors, better drains, better whey tanks; many where help was scarce. In numerous instances the excuses put forth for these shortcomings were that the business was not sufficiently remunerative to warrant the expense of repairs and more help. When I suggested that cheese prices were very high and that milk patrons could well afford to pay fair prices for manufacturing I was invariably told, "if I put the price where it belongs the neighboring factorymen will take all my patrons." If that complaint were made to an unprejudiced jury as frequently as I was obliged to listen to it, that body would become convinced beyond a reasonable doubt that nine-tenths of the cheesemakers in eastern Wisconsin are engaged in the noble arts of making cheese and cutting each others' throats.

I found makers who preach cleanliness to their patrons yet never refuse to accept dirty milk from one patron and mix it with clean milk delivered by another. I found numerous factory-men who didn't appear to have sufficient ingenuity to arrange for conveying all the whey from the vat to the whey tank; part of it would leak on the soil at various places. Numerous others were found who used tight whey conductors which entered the make-room and emitted foul odors therein. While there is much room for criticism yet I found many who were planning to make improvements and it is plainly apparent that indifference to progressiveness is rapidly vanishing.

Among the factories where American cheese is being made there are still some who are without the Babcock tester and

where the operator is quite ignorant as to its use. In Sheboygan, Ozaukee and Washington counties the makers are unprogressive in this respect, over seventy-five per cent of them still practicing the pooling system. I am sorry to say this condition prevails almost entirely throughout the state at factories where sweet curd cheese is being made.

Among the cheesemakers who pay by test I found a few who were so unskilled and reckless in the operation of testing that they failed to accurately determine the per cent of fat, and who, after completing a test did not know the per cent of fat contained in the milk of any one patron. I found that the cheesemakers who are particular about the character of their starters are yet in the minority.

Of all the highly important factors bearing on milk production, the question of stable ventilation has never received the consideration due it by those forces which make for improvement in dairying. This association is open to the same criticism.

The man at the factory should be able to advise the patron how to steer clear of avoidable troubles in milk. Stable conditions can always be controlled, yet it can not be denied that a big portion of winter milk is unnecessarily contaminated before it leaves the stable. Is the factory man, then, thoroughly competent in his position if he is unable to give the patrons complete directions on stable sanitation?

It can not be denied that more than eighty-five per cent of our dairymen, and cheesemakers, are not correctly informed on this subject. I would suggest that the members of this association make a crusade against unsanitary, unhealthful stables and, in doing so, remind the owners thereof that it is unlawful in Wisconsin to sell milk that is drawn from filthy cows, or from cows that are kept in stables which are not well lighted and ventilated or that are filthy.

The prevailing high prices for cheese may induce unscrupulous men into scheming out a cheap substitute for the same. Let us hope that Wisconsin cheese men and milk producers, remembering the disastrous results of a similar experience, will steadfastly refuse to contribute to such an undertaking. While the membership of this Association shows a healthy growth let us not forget that it embraces scarcely twenty per cent of the cheesemakers in the state. It appears to me that if each of us will use our influence with our friends that we

should be able to bring the membership to one thousand inside of two years.

It appears especially desirable that the Swiss end of our membership be increased. We know that those who do attend our meetings thoroughly enjoy themselves. We know they are good singers and we delight in hearing their songs.

In order that traffic in dairy products may not be carried on in improper channels numerous laws and regulations become necessary. Such laws can neither be made nor enforced without the right kind of public sentiment behind them. It required many years of time to create the public sentiment necessary to pave the way for the legislation we have secured.

The existing public sentiment will need to be made much stronger before our present dairy laws can be enforced to that extent which will insure the greatest benefits to the dairyman, to the honest, progressive factoryman and to the consuming public.

In the course of a year each member of this association will have a thousand opportunities, and he should improve them to strengthen this sentiment.

REPORT OF SECRETARY U. S. BAER.

Madison, Wis.

Mr. President and Members of the Association: I have the honor to report upon the work of this office for the year ending January 3rd, 1906.

I beg to submit the following condensed official statement for the association year just ended.

Total receipts	$1,509.97
Total disbursements	1.364.27
Balance in treasury	145.70

Itemized account of the receipts and expenditures for the association year, are given in the secretary's books.

In the books of the treasurer, Mr. Fred Marty, an itemized report is made, showing the sources from which all money

paid in the treasurer's hands, were received, and the disbursements paid on orders 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 general success of the organization was never as encouraging as at the present time. The membership for the past year has increased nearly one-fourth over that of the preceding year.

In conclusion I desire to express my high appreciation and heart-felt thanks for the confidence placed in me for the several years I have served as your secretary.

Respectfully submitted,

U. S. Baer.

REPORT OF BOARD OF DIRECTORS.

J. Grootemont, Brillion, Wis.

Gentlemen: A meeting of the directors and officers of the Wisconsin Cheese Makers' Association was held at the state fair park on the thirteenth day of September, 1905.

Present, E. L. Aderhold, president; M. Michels, vice-president; Fred Marty, treasurer; U. S. Baer, secretary; John Cannon, official critic.

Present, directors, F. J. Karlen, Monroe; J. W. Cross, Mauston; J. Grootemont, Brillion.

Upon the motion of Mr. Cross, seconded by Mr. Grootemont, the secretary was instructed to call a meeting to be held in the city of Milwaukee on the 3rd, 4th, and 5th days of January, 1906.

Upon the motion of Mr. Marty, seconded by Mr. Cannon, the secretary was instructed to make final and complete arrangements with reference to convention halls, exhibition cheese rooms, and hotel headquarters in the city of Milwaukee.

Upon the motion of Mr. Grootemont, seconded by Mr. Cannon, the secretary was instructed to select two cheese judges from outside the state to score the American cheese exhibit, and one cheese judge from outside the state to score the foreign cheese exhibit.

Upon the motion of Mr. Grootemont, seconded by Mr. Cross, the rules were changed to read as follows: The cash premium will be awarded on the excess *pro rate* plans, to all entries scoring above and including 92 points.

Upon the motion of Mr. Marty, seconded by Mr. Cross, the secretary was instructed to change the rules governing the cheese exhibit so as to read that all cheese of all kinds regularly entered in competition for *pro rate* premium fund, medals and diplomas should become the property of the association, and that all such exhibits were to be sold at the close of the convention, and money received sent to the exhibitors.

Upon the motion of Mr. Grootemont, seconded by Mr. Cross, the secretary was instructed to arrange dates of the time of entries of cheese so as to have the entire exhibit judged prior to the opening day of the convention.

By order of the board of directors the rules governing the cheese exhibit were further 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 rate* premium.

We have examined the accounts and vouchers of the secretary and treasurer and find them correct.

(Signed) JOHN GROOTEMONT.
F. J. KARLEN,
J. W. CROSS.

TREASURER'S FINANCIAL REPORT FOR 1905.

FRED MARTY, Monroe, Wis.

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.

1905.			
Jan.	4	Balance carried forward	$301 97
Jan.	6	Paid memberships	300 00
Mar.	1	Paid memberships	8 00
July	2	State treasurer (cash)	600 00

Dec.	31	Republican Hotel	10 00
Dec.	31	Brillion Woodenware Co.	5 00
Dec.	31	The Wagner Glass Works	10 00
Dec.	31	Wisconsin Dairy Supply Co.	15 00
Dec.	31	Monarch Refrigerating Co.	10 00
Dec.	31	Frank L. Jones	10 00
Dec.	31	Sturges and Burn Mfg. Co.	5 00
Dec.	31	De Laval Separator Co.	10 00
Dec.	31	Creamery Package Mfg. Co.	25 00
Dec.	31	E. A. Roser & Co.	10 00
Dec.	31	Continental Cereal Co.	5 00
Dec.	31	A. H. Barber & Co.	10 00
Dec.	31	Chr. Hansen's Laboratory	10 00
Dec.	31	A. Booth & Co.	10 00
Dec.	31	Heller Chemical Co.	10 00
Dec.	31	Burroughs Adding Machine Co.	10 00
Dec.	31	A. H. Barber Creamery Supply Co.	10 00
Dec.	31	International Salt Co.	10 00
Dec.	31	David Muir & White	25 00
Dec.	31	A. J. Decker	5 00
Dec.	31	Cornish, Curtis & Green	10 00
Dec.	31	Golden & Company	5 00
Dec.	31	Diamond Crystal Salt Co.	10 00
Dec.	31	Creamery Mutual Fire Insurance Co.	10 00
Dec.	31	The J. B. Ford Co.	20 00
Dec.	31	The Colonial Salt Co.	10 00
Dec.	31	H. B. Ellsworth	5 00
Dec.	31	W. C. Thomas	5 00
Dec.	31	Crosby & Meyers	10 00
			$1,509 97

Disbursements.

1905.			
Jan.	4	Walter Mayer, 1 M. Programs	$65 00
Jan.	4	G. W. Rankin, printing	17 75
Jan.	4	F. A. Averbeck, 12 medals	56 00
Jan.	4	Walter Mayer, printing	26 00
Jan.	6	Expenses of secretaries' office	150 00
Jan.	6	F. J. Karlen, interest on loaned funds	19 00
Jan.	6	Telephone and telegraph	2 85
Jan.	6	Schwaab Stamp & Seal Co., 500 badges	60 00
Jan.	6	Republican hotel, stenographic services	4 80

Jan.	6	Express, freight, cartage, annual meeting	13 85
Jan.	6	Expenses, salary, clerk, annual meeting	13 40
Jan.	6	J. H. Monrad, traveling expenses	65 40
Jan.	6	Miss B. Spicer, stenographic services	7 35
Jan.	6	J. R. Biddulph, traveling expenses	12 83
Jan.	6	Hon. J. Luchsinger, traveling expenses	8 50
Jan.	6	John Hoeppner, traveling expenses	10 10
Jan.	6	Postage, carriage hire	1 70
Jan.	7	Cartage, postage	2 80
Jan.	8	Republican hotel, rooms and board, annual meeting	92 42
Jan.	18	Postage, express, printing, stationery and circulars	9 81
Jan.	21	J. F. Bachmann, traveling expenses	5 00
Jan.	21	J. W. Cross, expenses (cheese exhibit)	24 44
Jan.	21	A. J. Glover, traveling expenses	7 00
Jan.	21	Miss A. B. Roump, stenographic services	17 15
Jan.	21	Republican hotel, rooms and board	12 50
Jan.	21	G. H. Benkendorf, traveling expenses	7 38
Jan.	21	Walter Mayer, printing	14 75
Jan.	27	3 half-tone plates for annual report	10 75
Jan.	27	Mrs. A. L. Kelley, official stenographer	106 10
Jan.	28	Express, cartage, postage, registration	5 50
Jan.	28	Christ Schenk, traveling expenses	5 69
Jan.	28	Fred Marty, traveling expenses	7 50
Jan.	28	J. G. Moore, traveling expenses	3 77
Jan.	28	Cash pro rata premium fund	100 41
Jan.	30	Postage on letters	1 00
Feb.	2	Fred Marty, express, postage, and money orders	1 36
Feb.	2	Two account books	1 50
Feb.	2	Prof. J. W. Carson, traveling expenses	3 50
Feb.	13	Walter Mayer, printing	1 75
Feb.	20	Expenses connected with cheese exhibit	62 06
Feb.	27	Miss A. B. Roump, stenographic services	15 75
April	19	Postage, freight, express and cartage	11 15
April	19	Walter Mayer, printing	1 75
April	29	One half-tone cut, annual report	12 50
May	5	Miss A. B. Roump, stenographic services	1 65
May	15	Walter Mayer, printing	2 00
May	22	Postage stamps	4 00
May	22	Fred Marty, printing, stationery	1 00

June	11	Miss A. B. Roump, stenographic services	4 50
June	26	Postage	5 00
July	10	Printing circular letter and mailing	4 80
July	30	Postage	1 54
Aug.	1	Walter Mayer, printing	6 25
Aug.	11	Telegrams and telephone	1 45
Aug.	25	Walter Mayer, printing	1 50
Sept.	1	Cuts, photos, for annual report	6 55
Oct.	2	Postage	3 00
Oct.	7	Miss A. B. Roump, stenographic services	6 40
Oct.	9	Walter Mayer, printing	2 00
Oct.	23	Walter Mayer, printing	8 25
Oct.	28	Miss A. B. Roump, stenographic services	25 25
Nov.	10	Postage	6 00
Nov.	11	Walter Mayer, printing	8 00
Nov.	17	U. S. Baer, traveling expenses	6 40
Nov.	18	Postage	3 00
Nov.	19	Miss A. B. Roump, stenographic services	12 40
Nov.	30	Postage, telegrams and telephone	6 40
Dec.	1	Miss A. B. Roump, stenographic services	11 45
Dec.	4	Western Passenger Ass'n, joint agent fees	17 00
Dec.	6	Western Union, telegrams	1 45
Dec.	8	Postage	2 24
Dec.	8	Western Union, telegrams	1 06
Dec.	10	Postage, mailing programs	1 00
Dec.	12	Postage, mailing programs	10 00
Dec.	16	Postage, mailing programs	10 00
Dec.	18	U. S. Baer, traveling expenses	4 28
Dec.	26	Postage, mailing annual report	86 00
Dec.	27	Postage	1 48
Dec.	29	Postage	1 40
Dec.	30	Miss A. B. Roump, stenographic services	8 75
Dec.	31	Fred Marty, treasurer, postage	1 00
		Total Disbursements	$1,364 27
		Balance in hands of treasurer	145 70
			$1,509 97

Respectfully submitted,

FRED MARTY,
Treasurer.

SOME OF THE BENEFITS CHEESEMAKERS DERIVE FROM EXHIBITING THEIR PRODUCTS AT COUTY, INTER-COUNTY AND STATE FAIRS.

WM. WATERSTREET, Spring Green, Wis.

The subject assigned to me by our worthy secretary is one of great importance, but as yet is in its infancy before the public eye, even though it has been more or less discussed through the columns of our leading dairy papers. Much can be said on this important topic.

One of the best ways in which a cheesemaker can learn the fine points in making cheese of a high grade is to place his product in competition at some fair or convention. Here expert judges are secured, who know the fine points of both making and judging cheese. The maker has an opportunity to meet the expert in person, as well as question him on all points he may desire information. This is a privilege that should be eagerly sought by all cheesemakers.

The cheese contest held in Spring Green last September, demonstrated to the exhibitors present, the vaule of such an exhibition. This contest was an educational one, making it very interesting and instructive to the cheesemakers in attendance. Secretary Baer did the scoring in this contest and presented the necessary criticisms on the cheese and butter displayed. Many who visited this department of the fair, were patrons of the exhibiting cheesemakers and all seemed deeply interested as well as pleased with the judging and criticisms. Mr. Fred Carswell's talks on the composition and cleanliness of milk were very instructive. These talks were made especially interesting by the use of mounted specimens.

The farmer is the foundation of the whole problem. He is one who is to be educated as well as the factory operator. Let the cheesemaker and his patrons hold occasional meetings and discuss the question of delivering perfect milk to the factory and other live topics. This would do an untold amount of good.

Every cheesemaker should be interested in the uplifting of the dairy work as it is the leading Wisconsin industry. He

must educate himself in his chosen line of work by reading dairy papers and exhibiting his cheese at every fair or convention which he has access to.

Dairying is more beneficial to the farmers financially than any other line of agriculture, consequently we find creameries and cheese factories located at convenient distances from the patrons throughout the entire state.

Why can't each locality have a scoring contest whether it be at a fair, convention or institute? The result of such a contest would be beneficial to all concerned. Each exhibitor will do all in his power not only to do his best in making cheese, but to do a "little better" than his neighboring factory, thus awakening an interest in better products. At successive meetings he can watch his score raise until it reaches the highest test of perfectoin.

DISCUSSION.

Mr. Monrad: What is the matter with the boys, are they asleep? I came out to Wisconsin to hear good discussions. I just want to make one remark about these small competitions at fairs. I think it a splendid idea, providing you get the right judges, but if you had seen the judging that I have seen on butter and cheese on some small occasions, you would think it was better not to heve those competitions, so I want to go on record as believing that if you have expert judges, men like Baer, for instance, these competitions are all right, but it you get a man that does not know good cheese from bad they are worse than nothing.

Mr. Moore: I think we all appreciate what Brother Monrad said in regard to securing good judges, but I know of no reason why we cannot secure such at these tests. As a rule the trouble is that the butter and cheesemakers won't stand for better judges, they can't stand the criticism against their work, and I don't blame them. When I went to Chicago to try to secure a judge for the Wisconsin Butter Makers' Association next week, I tried to get Mr. Collier, who is a man of national reputation and he refused absolutely to do the work, and why? He said, "These fellows,"—and I presume he included the officers of the different associations—"do not protect us against the criticism that comes to us." When a man, who under-

stands his business as Mr. Collier does, tries to do his best and then receives the criticism that he many times does receive, I see no raeson for complaint that we have at times poor judges. It is up to the boys themselves to receive such criticism in good faith and to try to profit by it, and not lay a lot of blame on the judges.

Mr. Noyes: I do not believe that that is always the case. We had a little exhibit in Richland county, which was very fine and we had a good judge and I did not hear a single criticism passed upon his judgment. I had the pleasure of running over the cheese with him and I believe his judgment was good, I know that the cheese was good, and I am sure that great benefit came from that test, so that all localities perhaps are not so critical. We had a regular cold storage box fixed for our exhibition and our room stood at 56 or 58 all the time, while we all know that in many cases the cheese hasn't proper surroundings and cannot be properly presented. They should demand a better place and they will be better satisfied; at all fairs they should demand the right kind of place, whether county or state or inter-county fairs, and I think you would find then that there would be less criticism of the judges.

The Chairman: I presume there are some here who could testify to some of the benefits perhaps of the criticisms they received, although they may have thought they were unjust at the time. I have been doing a lot of judging myself in past years at the state fair and other places and I have seen the cheese steadily improve along those lines that were most criticised from year to year. I believe it has done a lot of good. We can't learn anything by being patted on the back; the only way to improve is to study, make mistakes and find out why, and these contests are for the purpose of learning where our mistakes are. We should not enter cheese simply to see what a high score we can get, but we should try to learn what we can. If there are no more remarks along this line, I will read to you a letter from the Hon. S. A. Cook of Neenah, who, six or eight years ago, was a member of the lower house of congress, and it was through his efforts that the National Filled Cheese Law was passed during that session. The letter incloses a check for $26, and I want to say on behalf of the association that we accept with pleasure this donation, and we extend the thanks of the association to Mr. Cook for his generosity.

CHEESE EXHIBIT AT THE CHEESE MAKERS' ASSOCIATION.

LETTER OF GREETING.

HON. S. A. COOK, Neenah, Wis.

NEENAH, Wis.,
Jan. 1st, 1906.

MR. E. L. ADERHOLD,
President Wisconsin Cheese Makers' Association,
Milwaukee, Wis.

Dear Sir:—

Enclosed find check for annual dues and the balance for the cause, with my regrets that I cannot have the benefit to be derived and the pleasure of attending the 14th annual meeting of Wisconsin Cheese Makers' Association.

You have my earnest hope that success may attend every effort for the advancement of the association and the good work that it has done and can do to build up and strengthen the cause of the dairy industry of our state and nation.

I am glad to say to the association that I am thankful that I have been permitted to live to see Wisconsin the first in dairy products in this great nation of states. Keep up the good work that you have fought out so earnestly. The goal is worth maintaining. You can go higher; the industry is yet in its infancy.

With greetings of the New Year to you all, I am

Very truly yours,
S. A. COOK.

DAIRY FIELD WORK.

H. C. SEARLES, Fond du Lac, Wis.

Much is being accomplished in educating the manufacturers of cheese in Wisconsin, also in educating the patrons in delivering clean milk at factory, which all dairymen realize we must have to produce a first class cheese.

Instructors are being kept in the field for the purpose of helping any that may be having trouble in regard to quality of their cheese or the poor quality of milk being delivered at their

factory. The services of such instructors are nominal, considering the benefits derived from them. I know of one instance in particular. A cheesemaker manufacturing on an average of 400 pounds of cheese per day, claimed that for six months he had lost more than the make amounted to on account of the poor quality of his cheese. Thinking it was about time to get help or retire from the business, he secured the assistance of an instructor for three days and since has had no more trouble with his cheese, but on the other hand, has been complimented by the buyers on the excellent quality of his product. The loss sustained by this gentleman is said to have amounted to about nine hundred dollars, which might have been deposited in the bank to his credit had he known where to secure help as soon as his trouble started.

I wish to say a few words on the sanitary and unsanitary conditions of our cheese factories in Wisconsin. The existing conditions at many factories demand that much and careful attention be given to this important subject, for there is no place where sanitary conditions are more essential than the place where cheese is manufactured. Many of our factories are so situated that it is almost impossible to get proper drainage, having to depend upon the natural drainage of the soil around them. Some of the worst conditions may be described as follows: Impure water, gutters, whey spouts and tanks leaking and filthy; floors rotted, leaking and dirty; walls and ceilings dirty, dingy and hanging with cobwebs; leaking vats and unclean utensils; surroundings untidy and the building without any provisions for the exclusion of flies; careless and untidy makers; lack of modern machinery and poorly built and ventilated curing rooms. We have too many such factories operating in direct opposition to one another and as a result the profits are so small that one half of them cannot afford to pay a good maker fair wages. It would be a grand thing for the cheese industry of Wisconsin if one half of these small unsanitary factories were destroyed, then those remaining would be sufficiently patronized to enable them to provide proper machinery and employ good makers who could turn out a quality of goods that would be a credit to himself and the state as well.

It is hoped by the aid of the instructors and the splendid work accomplished by the inspectors sent out by the Dairy and Food Commission to see a great improvement in the uniform

quality of our cheese at the close of the year 1906 in Wisconsin.

DISCUSSION.

The Chairman: This is a comprehensive subject. Now, wade into Mr. Searles. This is your convention.

Before you begin I want to say that within the last two or three days knowledge has come to me of two cheese factory men whose factories were visited by insurance agents, that is, by the agents carrying insurance on those factories, and when they saw what nice factories they were, in what a business-like manner everything was transacted and how clean and well kept up everything was, they were surprised at it, and they cut the rate of insurance in two on that account.

Mr. Marty: I wish Mr. Searles would explain what he discovered at the place where he says the loss was $900 and what has been done to overcome the trouble?

Mr. Searles: I just happened to pass by that place on my travels. When I went into his factory the gentleman had one curd knife only and it seemed his trouble was in not letting sufficient acid develop in the whey, and his cheese became open, Swiss holes developed. That was the trouble. He had no curd mill to grind the curd and was working it in the old hand-stirred way.

Mr. Marty: The conditions then were not unsanitary at all?

Mr. Searles: In one way it was in an unsanitary condition. At that time I ordered him to get a new curd knife and curd mill and to clean up in general throughout the factory and whitewash his curing room and make needed improvements. Three days I worked there and he has told me since then that he has had no more trouble with his cheese, but, on the other hand, has been complimented by buyers on the good quality of his product.

Mr. Berg: In your travels through the state how many factories have you come across that did not use any curd rack in the bottom of the vat, about what per cent?

Mr. Searles: I should judge about one-third mat the curd on the bottom of the vat.

Mr. Berg: Do you recommend that?

Mr. Searles: No Sir, I do not.

Mr. Moore: What is the general attitude of the makers toward the inspector or instructor when he visits the factories, especially when he has not been sent for?

Mr. Searles: At some places, at first they seemed to be a little bit off, but when they found out that I am not an inspector they lighten up a little bit on me. I found by using kindness toward them that I can get along very well with them. I think one needs to be a mind reader a good many times in getting along with different cheesemakers.

Mr. Meyer: You said when they discovered you were not an inspector, the atmosphere was different. In what way?

Mr. Searles: Some of them said the inspectors were a little bit harsh on them. I presume in lots of cases they need to be.

Mr. Berg: What is your main objection against matting cheese curds in the bottom of the vat?

Mr. Searles: There is not an even temperature on the curd. The bottom would be warmer than the top and there is more chance for a loss of fat and the curd is not ripened evenly, neither would there be proper drainage.

A Member: Have you ever had any trouble with curds sticking to your cloth on the cheese racks?

Mr. Searles: I never have, unless it would be caused by too much heat. I think perhaps that would be one thing that would cause it.

A Member: Do you think the use of racks is increasing or decreasing?

Mr. Searles: I think it is increasing.

Mr. Berg: Don't you find where the curd is matted in the bottom of the vat that the curd gets kind of tough and leathery?

Mr. Searles: Yes, I see that in a great many places. A great many of the boys have the self heating vats and they claim that by using the racks they cannot keep it warm enough and that is the reason they put it on the bottom of the vat.

Mr. Berg: If they would not be quite so much in a hurry to get out of the factory in the afternoon, they could overcome that somewhat by leaving the curd a little longer on the rack.

Mr. Searles: Yes, they would accomplish the same thing if they left the curd a little longer on the rack, instead of rushing it through too quick. That is where lots of the boys have their trouble, in trying to get through too quick.

A Member: How about curd sinks? They have not any

rack at all. I have seen them used in many places where they havn't any way of heating at all.

Mr. Searles: It is very necessary to hold the curd at the right temperature while the acid is being developed.

Mr. Noyes: How warm is the curd when it runs too much butter fat?

Mr. Searles: I should say they were holding it at about 104.

Mr. Noyes: And how high do they cook in that case?

Mr. Searles: I have seen them cooking as high as 108 and 110.

Mr. Noyes: And what would you consider the proper heat to keep the curd?

Mr. Searles: I think that 102 is high enough. Some think that cooking it high is all that is necessary and they do not look to the firming of the curd up in the proper shape.

Mr. Noyes: Do you find as a general thing that curds are kept up to 102?

Mr. Searles: Not very many. There are places where they are held at 104; usually it is around from 96 to 98, which is a better temperature.

A Member: What are the advantages of a curd sink?

Mr. Searles: Well, I do not think you derive very much advantage from a curd sink, I could hardly say enough to pay for the extra expense.

The Chairman: We have here Mr. Steinhoff, one of our cheese judges who comes from Cananda. Mr. Steinhoff, what proportion of factory men in Canada use the curd sink?

Mr. Steinhoff: In Western Ontario there is a very small percentage of them that are not using the curd sink, in fact, they are using it almost universally. In Eastern Ontario there is a large percentage that still cheddar in the vat.

The Chairman: Where they have not the curd sink, do they use racks in the vat?

Mr. Steinhoff: In some cases, but very few.

The Chairman: Is there any difference noticeable between those using and not using it?

Mr. Steinhoff: I cannot say that there is. I know of one factory, for instance, in Western Ontario, run by two young ladies, and it is an example for cleanliness for all the others. They have no sinks, but they use the racks in the vat. Of course it makes a little more work. I think without any

doubt though that a superior cheese is made where they do use the racks. It has the advantage that you can more quickly drain in that way, especially fast working curds.

Mr. Noyes: I think that the trouble with the curd in the bottom of the vat is caused by leaky valves very often. The curd becomes over-heated. If cheesemakers are careful about that part of the work as well as the other, they do not get that overheated condition. In my experience, curds are under-heated rather than overheated. I was interested in the insurance men that the chairman talked about that cut the insurance in half. That is the kind of men we are looking for.

The Chairman: I don't want to do any advertising for the insurance business, but this happened in the neighborhood where Mr. Caspar lives, and Mr. Caspar is here.

Mr. Berg: I want to ask about how long a time would the average maker have the curd in the whey?

Mr. Searles: Most of them calculate two hours, but there have been instances where they had it in there between three and four.

Mr. Berg: Wouldn't it get whey soaked in four hours?

Mr. Searles: Yes, it would come out in bad shape.

A Member: By heating up to 98 or 100, and keeping it at that temperature for two hours, do you get enough cook on your curd in two hours?

Mr. Searles: It depends on where you set your milk. If you set it right, you can get a good cook in two hours by keeping it stirred, but you must not let it settle on the bottom as many do.

Mr. Grootemont: Don't you think it is better to stir the curd with an agitator than with a rake?

Mr. Searles: I think perhaps it is, perhaps there is a more steady circulation of the curd in the whey. I think if there were more agitators used throughout the country the makers would have better success.

Mr. Grootemont: Do you always use a cloth on the racks?

Mr. Searles: Yes, always.

Mr. Grootemont: We had a sort of inventor out our way who invented some racks and we have all taken them up and we think they can't be beaten, and we use no cloth with them. The rack, instead of being the width of the vat, is made in two pieces, and when we put the curd on the rack we slip, first, this one in, and then that one, and it is all on the rack as quick as that. They do away with the cloth.

Mr. Monrad: How big are those racks?

Mr. Grootemont: Just half the width of the vat, and they are very handy.

Mr. Monrad: What is the space between the slats on the rack, if you use no cloth?

Mr. Grootemont: It is so that there cannot be much curd run through, just so as to let the whey run through. There will be a little curd drop through, of course. After you cut the curd you can get those curds clean up from the first two racks and then clean up from the other two racks, and never have to be bothered with the cloth, and where the cloth is not clean it is a very bad thing for cheese.

Mr. Searles: Of course it is necessary that the cloth should be kept clean at all times. It is well to have two or three cloths, so you will always have a clean one.

Mr. Schwingel: I would say that the man that would not keep the cloth clean would not be using any kind of rack in a short time, especially with the inspectors we have at present.

Mr. Fraser: Sometimes the cloth is thrown into a pail of water and maybe they wash it and maybe they don't, they just wring it out and hang it up.

Mr. Searles: That puts me in mind of these self-heating vats, there are so many of them used, and I think it would be well if they were done away with and steam used entirely.

Mr. Schwingel: I don't think it is really necessary to use cloths. We have tried doing without for two or three years and we enjoy it.

Mr. Searles: It saves some little waste going through the rack.

Mr. Monrad: Doesn't your curd that goes through the rack get heated too much?

Mr. Schwingel: Not if you have no steam on your vat; we have never found any trouble.

Mr. Noyes: With a common rack, it is necessary and proper to have a cloth, I think.

Mr. Schwingel: We have linen strainer cloths and they can be washed very easily.

Mr. Searles: A man that does not keep his cloths and other utensils clean is not fit to be in a factory.

Mr. Steinhoff: What percentage of factories in your district use sinks?

Mr. Searles: There are very few, I have found only one, I think, in my travels.

The Chairman: Mr. Searles, what proportion of cheese-makers use the commercial starter, as you have seen in your travels?

Mr. Searles: Well, I should judge about one-eighth.

The Chairman: Do you think that the common sour milk starter can be compared with the other in efficiency?

Mr. Searles: No, sir, I do not, if the commercial starter is properly made.

Mr. Monrad: What percentage use a starter at all?

Mr. Searles: I should judge two-thirds; yes, more than that, all of three-quarters.

A Member: In using the curd agitator, would a rake be necessary?

Mr. Searles: I think certainly it would.

The Chairman: Give us your idea why you think so.

The Member: It is just my imagination, I never used any curd agitator.

The Chairman: What makes you imagine that it would be better?

The Member: Why, I think that the fast working curd would clog up, especially in the corners.

The Chairman: It is not necessarily a fast working curd, you know, when you use the agitator.

Mr. Noyes: It can be kept out of the corners, but it takes something more than the agitator.

Mr. Searles: Yes, it is always necessary to keep that curd working in the corners with the rest, not let it lie idle, and you must use something to do so, your hand or something.

Mr. Marty: Wouldn't it be much better to get a vat without corners?

Mr. Searles: That is a good plan, too; have a round-cornered vat.

Mr. Cannon: Isn't it advisable to cut the curd considerably finer where you use the agitator?

Mr. Searles: Yes, you get better results.

A Member: Which do you prefer, a linen strainer or a cheese cloth strainer over the curd rack?

Mr. Searles: I think the cheese cloth would be better.

A Member: You can change that oftener than you can the linen strainer and it is easier to keep clean, too.

A Member: Where these cloths are thoroughly washed and hung up, isn't there liable to be something in the air; for instance, road dust, to put them out of condition?

Mr. Searles: Of course, I would prefer hanging them somewhere where they would not come in contact with road dust or anything of that sort.

A Member: I think that a linen cloth is better for the simple reason that you can heat at a more even temperature and retain it.

Mr. Searles: If you have a cover over your vat, you can hold your temperature all right.

Mr. Noyes: Linen cloths wash the easiest of any cloth, they have good sized meshes and last much longer and I think they are the best, the most sanitary, if you please.

Mr. Hoeppner: I use cheesecloth and I only use two in a year.

Mr. Schwingel: If the gentleman only uses two cheese cloths in a year, I see no reason why he couldn't use linen a good deal longer.

Mr. Noyes: I should like to find a cheesemaker that could use a cheese cloth for a year. I have furnished a good many cheese cloths and I never had one that lasted me a year or six months or three months or more than two months to be in good condition and without any holes.

The Chairman: A few years ago some of our cheesemakers used a cheap kind of sheeting, costing about four cents a yard. It was loosely woven like cheesecloth, but stronger, and it made a very desirable cloth for the purpose. It is not kept in all the dry good stores. The only objection they found to the cheesecloth was that it did tear easily.

Mr. Cannon: Is there anybody in the room that uses those new tin racks that have just come out and is it necessary to use cloth on those racks?

Mr. Berg: The only objection we have to the tin racks is that it is so hard to keep them clean.

The Chairman: These tin racks were perforated and there was no cloth used on them.

Mr. Fraser: They are made just the same as the wooden racks, they go clear across the vat. One difference is, one side has no slat on it, except in the middle. They come directly to a point on the side of the vat, the spaces are a trifle narrower than on the other rack, but they can be kept clean very nicely.

The Chairman: Mr. Searles, do you find cheesemakers, as a rule, have covers on their vats?

Mr. Searles: Most of them have covers on them. I should judge maybe there was one-eighth that had not covers.

Mr. Berg: Do those factories pass the sanitary inspection that do not use covers?

The Chairman: I do not think that would have any bearing on the sanitary part of it. It would allow the curd to cool quicker.

Mr. Monrad: Wouldn't it have some bearings on the flies?

The Chairman: Yes, that is right; it would in fly time, it would have a bearing on the sanitary part, but it wouldn't if they had the flies all outside the building.

Mr. Noyes: Or if they had sanitary flies.

A Member: Are those covers caught up over the vats, or are they spread over?

Mr. Searles: Some are hung up over and some spread over.

Mr. Marty: I have seen covers over cheese vats that would have been more sanitary if they had not been there at all.

Mr. Searles: Yes, I have seen some of those myself.

A Member: Mr. Searles, would you depend wholly on the agitator in firming up your curds, or would you use a rake?

Mr. Searles: I would do something for the corners of the vat, and at the last I should use the rake.

A Member: Do you recommend drawing down the whey and using the rake?

Mr. Searles: Yes, I draw down the whey. You can get the whey off quicker when the acid develops.

Mr. Dassow: Isn't it true that if vats are shaped just right, there would be no trouble with the corners?

Mr. Searles: I hardly think that you could catch all the curd and agitate it with the agitator.

Mr. Dassow: If your curd is doing all right from the start all you need is to loosen the curd from the sides of the vat just once.

The Chairman: Mr. Dassow, are you sure that the speed of your agitator is not higher than it ought to be?

Mr. Dassow: Not in my judgment; the speed is not too high as long as it doesn't break the particles of the curd.

Mr. Noyes: What does your whey test?

Mr. Dassow: It comes as close as any of them, I guess. I am sure it doesn't test more than .3% butter fat.

Mr. Steinhoff: Are agitators in common use in this state?

Mr. Searles: Well, quite common, they are getting to use them more and more.

Mr. Steinhoff: The common practice in Canada is to make the corners of the vats slightly rounded, where you use the agitators.

Mr. Searles: We have them here in this country and I think they are much better than those with the square corners in using the agitator.

A Member: In cutting the curd fine isn't there a greater loss of fat in the whey where you use an agitator?

Mr. Searles: If it is cut too fine, but if the agitator is properly used, run right, there will be no such trouble.

The Chairman: There is more cheese wasted with a rake than there is with the agitator.

Secy. Baer: When the agitator is run at the right speed.

The chairman named the following committee on resolutions: Bert Austin, Joseph Ward, H. C. Searles, F. B. Schwingel and O. A. Kielsmeier.

CHEESE SCORES.

The following announcement of the report of the judges on cheese was made by Hon. I. W. Steinhoff of Stratford, Canada.

Mr. President, and Gentlemen of the Convention: As chairman of the Committee on Cheese Judging I will say that in our work we had critics who followed us and made notes which, no doubt, you will hear of later.

The cheese scores are as follows:

American cheese.

Entry No.	Name of Exhibitor.	Style of cheese.*	Address	Flavor 45 points.	Texture 30 points.	Color 15 points.	Make-up 10 points.	Total 100 points.
1	Radel, B. W	F.	Richland Center, Wis	43½	27	15	9	94½
2	Andrist, G	F.	West Concord, Minn.	44	28	14	7	93
3	Blanck, Aug. H	F.	St. Cloud, Wis	42	25	14½	8½	90
4	Joslyn, Henry	F.	Richland Center, Wis	42	28	14½	8½	93
5	Grootemont, John	F.	Brillion, Wis	43	28	14	8½	93½
6	Brandt, Aug.	F.	Algoma, Wis	44	29	14	7	94
7	Gregorius, M. J	F.	Appleton, Wis	38	26	14½	9½	88
8	Pieper, H. F	F.	Eden, Wis	43½	27½	14½	9½	95
9	McCarthy, J. F	F.	West Concord, Minn.	35	22	13	7	77
10	Cannon, S. D	F.	Dale, Wis	43	26	15	9½	93½
11	Roycraft, A. J	F.	Chippewa, Wis	43	23	15	6	90
12	Vogt, John	T.	Freemont, Wis	42	27½	15	10	94½
13	Lehnherr, J	F.	West Concord, Minn.	36	24	14½	8	82½
14	Johnson U. L	T.	Brandon, Wis	41	26	13	7	87
15	Goodrich, C. E	F.	Lone Rock, Wis	41	29½	14	10	94½
16	Noyes, H. L	F.	Muscoda, Wis	44½	29	14½	10	98
17	Keller, Ed	D.	Grafton, Wis	40	27	14½	9	90½
18	Pickard, Chas	D.	Muscoda, Wis	41	26	15	9½	91½
19	Bergs, Joseph	D.	Edgar, Wis	43	27½	14	8½	93
20	Wismer, Frank	D.	Plain, Wis	42	28½	15	10	95½
2	Bruhn, Axel	D	Spring Green, Wis	43	29	14	9	95
2	Wolter, Fred L	D.	Seymour, Wis	42	27	14	9½	92½
	Hoeppner, John	D.	Marion, Wis	41	29	14½	9	93½
4	Wilkowske, H. A. F.	D.	Mishicott, Wis	44	29½	15	10	98½
5	Frazer, Geo. W	Y.	Appleton, Wis	43	27	14	8	92
6	Last, B. O.	L	Luxemburg, Wis	42	28	14	10	94
7	Kielsmeier, O. A	C.	Manitowoc, Wis	44	27	14½	10	95½
28	Steinhart, G. J	L	Kewaunee, Wis	42	28½	15	10	95½
29	Mueller, Math	L.	Stangelville, Wis	40	28	15	9½	92½
30	Bremmer, C. A	F.	Plain, Wis	44½	30	15	10	99½
31	DeHaan, Matthew	F.	Lineville, Iowa	43½	26	15	8½	93
32	Biddulph, J. R	F.	Providence, Ill	39	24	12	7	82
33	DeHaan, Matthew	T.	Lineville, Iowa	42	28	15	8	93
34	Frazer, Geo. W	?Y.	Appleton, Wis	35	27	15	8½	85½
35	Garton an, Chas	L.	Sheboygan, Wis	44	28	15	10	97
36	Finstad, A. W	P.	Kewaunee, Wis	44	30	15	10	99
37	Priebs, Henry	P.	Kewaunee, Wis	42	28½	15	8½	94
38	Wallace, Pat	F.	Hortonville, Wis	42½	29	15	9	95½
39	Koopmann, A. C	D.	Port Washington, Wis	41	27½	14½	7	90
40	Cross, J. W	?T.	Manston, Wis	34	27	15	9	85
41	Freund, W. H	D.	Hilbert, Wis	43½	29	15	9	96½
42	Freund, A. A	D.	Hilbert, Wis	43½	29	15	9	96½
43	Cranston, P. H	F.	Soldiers Grove, Wis	42	28½	14½	9	94
44	Waddell, W. N	F.	Hub City, Wis	42	28½	14½	9	94
45	Madding, Wallace.	F.	Richland Center, Wis	44	29	15	10	98
46	Lieurance, Scott	F.	Yuba, Wis	43	26	15	10	94
47	Hannowell, Freeman	D.	Boaz, Wis	44	28	15	8	95
48	Strassburg, Charles	F.	Loyd, Wis	37	26	14½	10	87½

* Legend.

Swiss and block cheese.

Entry No.	Name of exhibitor.	Style of cheese.*	Address.	Flavor 35 points.	Appearance on tryer (holes) 30 points.	Texture 20 points.	Salt 10 points.	Style 5 points.	Total 100 points.
1	Blaser, Christ.....	R	Brooklyn, Wis.....	32	25	18	8	5	88
2	Andrist, G.	R	West Concord, Minn..	30	21	18	8	4	81
3	Ackerman, Jos. ..	R	Monroe, Wis.....	35	30	20	8	5	98
4	Wehinger, John . .	R	Woodfort, Wis.....	34	29	19	9	5	96
5	Held, Fred.....	R	Mt Horeb, Wis.....	31	20	16	9	5	81
6	Vogel, Gottfried...	B	Mt. Horeb, Wis.....	30	25	15	5	5	80
7	Thoni, Mike.	R	Hollendale, Wis.....	35	28	18	8	5	94
8	Marty, Jake	R	Brodhead, Wis	33	24	19	9	5	90
9	Marty, Jacob	R	Brodhead, Wis.....	27	25	16	8	4	80
10	Regez, Jacob.....	B	Monroe, Wis	34	28	20	9	4	95
11	Regez, Jacob	R	Monroe, Wis.	30	25	17	8	5	85
12	Regez, August	R	Monroe, Wis	32	25	18	8	4	87
13	Regez, August. ..	B	Monroe, Wis	33	28	19	8	5	93
14	Regez, Herman....	R	Monroe, Wis.....	32	27	18	8	4	89
15	Regez, Herman ...	B	Monroe, Wis.....	35	26	18	8	5	92
16	Regez, Ernest, Jr..	R	Blanchardville, Wis..	33	27	19	8	5	92
17	Regez, Ernest, Sr..	R	Blanchardville, Wis..	35	28	20	9	5	97
18	Strahm, Christ. ..	R	Blanchardville, Wis..	33	29	17	9	5	93

*Legend.

Brick cheese.

Entry No.	Name of exhibitor.	Address.	Flavor 40 points.	Texture 40 points.	Color 10 points.	Salt 5 points.	Style 5 points.	Total 100 points.
1	Andrist, G.....	West Concord, Minn...	35	35	10	4	4	88
2	Schmidt, Carl.....	Burnett Jct., Wis ..	28	30	8	3	4	73
3	Vogel, Gottfried.....	Mt. Horeb, Wis.....	38	38	9	4	4	93
4	Schaller, Alex.	Mt. Horeb, Wis.....	35	35	10	4	4	88
5	Westphal, F. C	Columbus, Wis.....	37	33	10	3	5	88
6	Brinkmann, C. F	Coon Valley, Wis	35	35	8	5	5	88
7	Held, Fred.....	Mt. Horeb, Wis.....	31	32	8	4	4	79
8	Anderegg, Casper ...	La Crosse, Wis	36	38	8	4	4	90
9	Kunz, F. W	Hustisford, Wis	38	35	9	4	4	90
10	Regez, Jacob	Monroe, Wis.....	36	37	9	4	5	91
11	Regez, August... ...	Monroe, Wis.....	38	37	9	5	5	94
12	Regez, Herman.. .	Monroe, Wis.....	37	37	10	4	4	92
13	Reid, J. J.....	Oconomowoc, Wis.....	38½	36	10	4	4	92½

Limburger cheese.

Entry No.	Name of exhibitor.	Address.	Flavor 40 points.	Texture 40 points.	Color 10 points.	Salt 5 points.	Style 5 points.	Total 100 points.
1	Hefty, Jacob	Belleville, Wis.	38	38	9	5	5	95
2	Elmer, Henry	Belleville, Wis.	36	35	9	4	5	89
3	Beller, Christ	Belleville, Wis.	34	33	9	4	4	84
4	Elmer, Jacob	Belleville, Wis.	38	36	9	5	5	93
5	Marty, Jacob	Brodhead, Wis.	35	30	7	3	4	79
6	Regez, Jacob	Monroe, Wis.	37	36	9	4	5	91
7	Regez, August	Monroe, Wis.	37	36	9	4	4	90
8	Regez, Herman	Monroe, Wis.	38	38	9	5	4	94
9	Regez, Ernest, Sr.	Blanchardville, Wis.	39	36	9	4	4	92

Sage cheese.

Entry No.	Name of exhibitor.	Address.	Flavor 45 points.	Texture 30 points.	Color 15 points.	Make-up 10 points.	Total 100 points.
1	Biddulph, J. R.	Providence, Ill	40	27	12	8	87

* —Legend.
B —Block.
C.—Cheddar.
D.—Daisy.
F.—Flat.
L.—Longhorn.
R.—Round, or Drum.
T.—Twins.
Y.—Young America.
? —Complimentary.

C. A. Bremmer, Plain, Wisconsin, won first premium, gold medal, on American cheese.

A. N. Finstad, Kewaunee, Wisconsin, won second premium, silver medal, on American cheese.

H. A. F. Wilkowske, Mishicot, Wisconsin, won third premium, bronze medal, on American cheese.

Jos. Ackerman, Monroe, Wisconsin, won first premium, gold medal, on Swiss cheese.

Ernest Regez, Sr., Blanchardville, Wisconsin, won second premium, silver medal, on Swiss cheese.

John Wehinger, Woodfort, Wisconsin, won third premium, bronze medal, on Swiss cheese.

August Regez, Monroe, Wisconsin, won first premium, gold medal, on brick cheese.

Gottfried Vogel, Mt. Horeb, Wisconsin, won second premium, silver medal, on brick cheese.

J. J. Reid, Oconomowoc, Wisconsin, won third premium, bronze medal, on brick cheese.

Jacob Hefty, Belleville, Wisconsin, won first premium, gold medal, on limburger cheese.

Herman Regez, Monroe, Wisconsin, won second premium, silver medal, on limburger cheese.

Jacob Elmer, Belleville, Wisconsin, won third premium, bronze medal, on limburger cheese.

The $100.00 cash premium fund will be awarded on the excess *pro rate* plan to all entries scoring 92 points and above.

Every exhibitor whose cheese scores 90 points and above 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.

Respectfully submitted,

I. W. Steinhoff, Stratford, Canada.
D. S. Crosby, Chicago, Ill.
Oscar Burgi, Chicago, Ill.
Judges.
J. W. Cross, Mauston, Wisconsin.
Superintendent.
J. D. Cannon, New London, Wis.
Fred Marty, Monroe, Wis.
Dairy Critics.

AFTERNOON SESSION.

The convention met at 2 o'clock, Wednesday, January 3, 1906.

The president in the chair.

THE PRODUCTION OF MILK FOR CHEESEMAKING PURPOSES.

Lewis Ostenson, Oconomowoc, Wis.

How does the production of milk for cheese making purposes differ from that for butter making, or some of the other purposes for which it is used? There should be no difference.

All milk should be perfect in every essential requirement. But this is not often the case. Milk for cheese making purposes needs as great care as any, and even greater care than when used for other purposes. It should be the best that it is possible to produce. Then how do we produce it? Not in a haphazard way. We do not depend on luck or chances. Nothing in this world runs by itself unless it runs down hill, and we do not want our business to end that way. We plan, and from the execution of those plans we expect definite results. We want to produce a large amount of milk when it can be kept the cleanest, when feed is the cheapest, and at that time of the year when it is easiest to do the large amount of work that milk production requires. Then what are our plans as carried out, and the reasons therefor?

There are three main things for which we plan. First, the time of freshening of the cow. Second, her feed. Third, her shelter.

WHEN TO BEGIN THE PRODUCTIVE SEASON.

We aim to deliver at the cheese factory acceptable and wholesome milk; and an abundance of it. In order to do this most easily and economically we have our cows freshen in April and May. By getting a good start at a favorable season we are more certain of success. It is soon after freshening, if the cow is properly cared for, that she gives her greatest daily amount of milk. In order to keep up this abundant flow of milk as long as possible, we take advantage of this favorable season both in regard to temperature and feed which are now given us in the best condition. The large amount of milk that is now produced requires considerable work on the part of the dairyman, and he is in better trim to do it than in winter. The shorter the time he keeps this milk under his own care the more economically will it be produced and in better condition will it reach the cheese factory. About the first of May milk is delivered to brick cheese factories both morning and evening. So the milk from this time on, is in the farmer's care the shortest length of time possible. It ought therefore to reach the factory in the best possible condition.

The spring of the year is regarded as a favorable and economical time for the coming in of cows, for then the climatic conditions are right and the feeding problem begins to take care of itself.

WISCONSIN CHEESE MAKERS' ASSOCIATION PRIZE CHEESE.

The next thing we plan for is how to keep up this large flow of milk as long as possible without interruption. And this leads us to consider the supplying of feed.

THE QUESTION OF FEED, PASTURE.

The feed given the cow will affect the quality as well as the quantity of milk produced. The kind of feed used is therefore of great importance both to the producer and consumer, if not also to the cheesemaker.

Pasture grass is a balanced ration for the cow, and one reason for starting in spring is that we may supply this balanced ration to the cow abundantly the whole summer, or as long as possible. Therefore I plan to have an abundant supply and succession of pasture for the whole growing season, and to select such as will not unfavorably affect the quality of milk. The first grass the cow gets in spring is from the old, or permanent pasture, which is made up of a variety of grasses according to its location. Much of it is June grass which starts early in spring, and is at its best for a short season only. It will not injure the cow to eat this early spring grass. But as it is now limited in quantity it forms but a small part of her ration. Her regular winter feed must be kept up and only gradually diminished as the grass increases in quality and abundance. For the main cow pasture a field of red clover is prepared every year. This is quite necessary, as second year clover is much more apt to winter kill than new seeding. But because clover starts to grow early, we do not therefore turn our cattle on it early, but wait till it gets a good start and covers the ground abundantly. The cows are not left on the clover all day, nor is it even yet, their only feed. They are fed some hay at least in the morning before they are turned on to the clover, and the permanent pasture is still made use of so as not to overfeed the cows on clover, or have them run over the field needlessly when they have had sufficient for the day.

If in the course of the summer this one clover pasture does not prove sufficient we get a new supply by using the second crop of clover for pasture instead of mowing it for hay. And if still later in the fall this should also prove insufficient we have still a third supply of clover new and unused in the new seeding of the present year grown in the fields of grain. We

depend mainly on clover for pasture, and with our three different sources of supply during the same year, we have a relay that does not often fail.

A SYSTEM OF PARTIAL SOILING.

In order that there shall be no unnecessary diminution in the flow of milk for want of sufficient and proper feed, a system of partial soiling is practiced. For this purpose we use corn in a limited way even if the pasture is fair. And if the pasture should be short, we start using it as early as possible, according to necessity. When once we have started using corn it is never discontinued, but it is used in addition to clover pasture and not exclusively. At this time of the year we make a special effort, if need be, to keep up the flow of milk, for the price is nearly as high as in winter. If pasture should be short earlier in the season, before the corn is mature enough, we have used the different grain crops for soiling purposes. If they would not greatly increase the flow of milk, they would at least keep it from going down, and that is one of the chief things to guard against in the production of milk.

Housing the cows includes not only protection against cold but also shelter against the excessive heat of summer. Open sheds or convenient wood lots will often be sought by well fed cows in summer. When thus provided, the flow of milk is not appreciably diminished by any external annoyance to the cows. In as much as it is more laborious to stable cows than to let them run out, the proper housing of them is often unduly delayed in fall, but always at considerable loss. It does not take more feed to house them but it takes more labor, but it is labor that will be well paid, for the bad effects of a cold night or storm continue to a great extent for the rest of the season. In connection with stabling, too great care cannot be taken to secure cleanliness of the milk. This can be secured only by keeping everything else clean. One advantage of having cows come in in early summer is that cleanliness is secured with greater ease than at any other time. Cleanliness is of the utmost importance in producing milk for cheese making purposes, for here, not only the cream but the whole milk is used. If there be some fault with the milk it is therefore more difficult to eliminate it from the cheese.

CONCLUSION—SUMMARY.

In conclusion then, it will be seen that by having the cows freshen in spring they have a long season before them when it is possible to produce a large amount of milk with the least labor and care on the part of the manager. The milk is delivered in the cleanest and best possible condition because it is not held over by the farmer but is taken directly from the milking to the factory.

There will be a time, from the middle of February to the middle of April, when the farmer delivers no milk to the factory. If this practice were universal, there would be no so-called "fodder cheese" made,—a term which ought never to be used. It would also give the cheesemaker a yearly vacation, and would greatly lessen the farmer's duties for a part of the year.

A system of four different relays of pasture is used. First, the permanent pasture, then the main field of new clover seeding, after harvest the second crop of clover, and last, the young clover seeding sown with the present year's grain crop for late fall pasture. And to supply still further any possible deficiency, the corn crop is used for soiling purposes.

There are other field crops that could be used in the production of milk but are objectionable on account of the taint they impart to milk, especially when not carefully fed. We get along with the least amount of grain and commercial feeds; but give some ground feed and oil meal a while before the cow freshens. Stabling the cow should be begun sufficiently early in the fall, and some shelter should not be neglected even in summer.

If rightly conducted, the production of milk for cheese making purposes, then, is an exacting yet profitable business,—profitable for the farmer, the maker and the consumer. But if the requirements of cleanliness and economy are disregarded, few enterprises will prove so unsatisfactory and unprofitable.

DISCUSSION.

Mr. Moore: Mr. President, last year at the Farmers' Institute round-up I read a paper on the care of milk, and in reading it over to some friends of mine beforehand they objected to my saying anything about the aeration of milk. They said, "You better look out, for just as soon as you get through some of those old farmers will jump on you." And so it proved. But I held to my plan in that regard and kept the aeration in my paper. I would like to ask Mr. Ostenson what he thinks about aeration of milk in making cheese?

Mr. Ostenson: I think there are some times when aeration is very necessary, but in my own methods I start in with the milk in a condition where aeration is least needed, perhaps. I think aeration is not only all right, but often necessary, especially toward spring and in the winter.

Mr. Moore: When you have a rank growth of clover, wouldn't it be a good plan to aerate the milk?

Mr. Ostenson: Yes, especially if one is not careful how he feeds it. If cattle are allowed to eat all of it that they want to, it would be quite necessary, but cows certainly ought not to be allowed to eat as much clover as they want to, not close onto the time of milking any way.

Mr. Moore: How about the straining of the milk?

Mr. Ostenson: Of course, the straining of the milk will make it cleaner in a certain way, but the milk should be handled in such a way that the straining would not be much of a help; in other words, there should not be much of anything to be strained out. No matter how well strained dirty milk may be, it would not compare in value with milk that was clean to begin with.

Mr. Moore: Down at the World's Fair in St. Louis I saw an idea there by the Connecticut Experiment Station in filtering out the filth of milk. In the southern part of the state where milk is shipped to Chicago at a certain place, I took the strainer and rinsed it off, there was sufficient dirt on there so that I got a very considerable quantity of material on the filter paper. Last fall, when I was out at the sanitary milk plant at Pewaukee,—and it would pay all of you to go there to see their methods of operation,—I noticed that they used an absorbent cotton for the strainer. I got some of those ab-

sorbent cotton strainers, and I strained the milk at these creameries, and any of you who were at the state fair and saw the exhibit there, can tell a good deal about the kind of dirt strained out of milk that was supposed to be already strained at the farm before it came to the creamery. It is a fact that our cows are not properly cared for, and it is necessary under our existing conditions, even if this stuff is strained out, the bacteria that are in the dirt originally, remain in the milk to grow under the conditions existing. I do not know much about the conditions existing in Green county where our foreign cheese is made, but I do know that some of the milk comes there in pretty bad shape. I understand that the Swiss cheesemakers will not permit the farmers to strain their milk before coming to the factory, and some of it comes in pretty bad shape. We have samples under glass that show the condition of some of it, and it is simply a fright and it is impossible for any man to make good Swiss cheese or butter out of milk in that condition.

I was talking with ex-Governor Hoard not long ago, and he was telling me about some babies that refused to eat this Eskay food or malted milk or anything like that, and yet when he fed them some really pure milk the babies liked it and picked up immediately. I doubt if very many of the farmers know what first class, really good milk is.

Mr. Monrad: I agree with Mr. Ostenson from the cheesemakers' standpoint that it is preferable to have the cows come in in the spring but I want to ask you if a cow coming in in the fall and another cow coming in in the spring, which cow will you get the highest result from at the end of the year? I am talking from the farmer's standpoint, not the cheesemaker's, which cow will give the biggest yield of milk for the whole year?

Mr. Ostenson: I think that will depend a great deal on the feeding problem. With a silo I think he will get as much milk by having the cow start in the fall as in the spring, but it depends on how the farmer is situated, how easily he can get help. It requires less labor to start in with the cows in the spring than in the fall. The cows have to have constant care in the winter, while in the summer they will take care of themselves to a degree, and it is easier to produce the milk by half, and in my own case I can produce more. Of course, it depends upon how the farmer is situated and whether he likes to

work harder. With some people it is as easy to get help in the winter as in the summer.

Mr. Monrad: I am rather astonished at that remark. I thought you could hire help in the winter at something like ten dollars a month as against twenty dollars in the summer. The gentleman spoke about taking extra care of the cows. It is just for that reason that the cows will give more if they come in in fall, because the farmer must and is willing to feed them well as long as they will give milk, but if they are dry through the winter the farmer thinks any old thing will do to feed them and keep them just alive, and when they come out of the pastures in the spring, it will take quite a little while to get them in condition.

Mr. Ostenson: There has been a change in labor conditions; we used to be able to get help in the winter for ten dollars a month, but that is not so now. There are three times of having cows come in; besides the two we have spoken of we can have them come in, some in the spring and some in the fall, and scatter along through the season. Which way a man wants to do is merely a matter of preference; he must consult his own circumstances and no one can say for another which is the best way.

Mr. Michels: What Mr. Monrad says fits in with my experience. There was a time when all of my patrons had their cows come in in the spring, but for the last ten years they have been changing, and I find that the farmer with the very same cows after he gets them changed around so that they come in in the fall, will make more money, because they give more milk and the milk carries a higher test and he will receive from ten to fifteen dollars more per cow. I am sure, from the farmer's standpoint, there is more money to be derived from the cows that come in in the fall. The point is that when they come in in the winter everybody knows that they must feed them to get them to yield anything, then in the spring time there is no feed like good pasture, and when they get into this good pasture, they are in good flow and they still give nearly as much milk as the cows that come in in the spring. Then when the pasture gets short, and the flies get to bothering, we don't expect so much of them, and it is time for them to drop off, even the cows that come in in the spring we expect to drop off then.

Mr. Wallace: Explain this higher test.

Mr. Michels: When cows give the most milk, the test is always lowest. Where they come in in the fall, they never give so much milk at any one time, and you will find the average for the year has been a higher test. I have watched them a good many years and have kept the figures and can show the figures today. I figure that a cow will yield about a thousand pounds more milk a year, each cow.

Mr. Ostenson: In regard to it being more profitable to have the cow start in in the fall than the spring, the only way you can make this out is by a man not taking his work into consideration. It is a great deal more work and it is harder, and the work cannot be done so fast. As far as the cows drying up in summer is concerned, the farmer does not want them to come in in the spring unless he is prepared to supply them with good food all the way through. It is foolish to go into the dairy business at all, unless he is prepared to take care of his cows. My opinion is that the amount of reduction in the flow in hot weather has been greatly overestimated. You think by looking at the cow that she suffers a great deal from heat, but according to my experience she reduces her milk flow very little, providing the pasture is good.

Mr. Michels: About this labor question, the farmer has more time to devote to his cows in the winter than in the summer when everything else is rushing. He has nothing to do but to sit by his fire and smoke his pipe after he has made his firewood, and he might as well attend his cows.

Mr. Ostenson: It is the general impression that the farmer hasn't so much to do in winter, but the days are much shorter and I find I am as busy in winter as in the summer time, and it is much harder to get help in some parts of the country.

CHEESE SCORING CONTESTS.

George W. Rankin, Whitewater, Wisconsin.

Editor Cheese and Dairy Journal and Creamery Reporter.

Mr. president and gentlemen of the convention—I want to say first that I deem it a distinct compliment to be placed on this program, because I believe any speaker that faces this

audience is facing the best intellect and the most progressive spirit that is typified in Wisconsin dairying, including Wisconsin's butter makers.

The subject that has been assigned to me is "The Value of Educational Cheese and Butter Scoring Contests." It is not a new subject by any means, and the gentleman who is to follow me, I am sure, can give a great deal more practical advice through his years of experience than I can possibly hope to do. So I shall only endeavor to take the lid off, as it were, and trust the discussion will follow of itself.

But for the sake of argument, suppose that we consider educational scoring tests in three divisions:

First. Are they of any value to the cheese and butter industries?

Second. If so, is the value commensurate with the time, trouble and expense necessarily used in promoting them and carrying them on? and

Lastly, can we get them in Wisconsin?

To answer the first question, we will have to turn to the experience of some of our neighbors, having had practically no experience in this state in scoring contests. We will turn to Minnesota. I dare say that the vale or hamlet that has not heard of Minnesota butter never heard of a good dairy cow.

Now, what is the reason that has placed Minnesota butter in its present position today? I believe that it is nothing more than the continuous scoring tests through the entire twelve months of the year. You cheesemakers, some of you, enter a cheese at this convention, and next week the butter makers will enter a tub of butter at their convention, and there you stop for the rest of the year. They don't do things that way in Minnesota; they keep at it the whole twelve months. For an expert opinion on this matter, I took the trouble to write to the Dairy and Food Commissioner of that state, also to the editor of the Dairy Record, and this is what they replied:

Editor Cheese and Dairy Journal:—

Our butter and cheese contests have been conducted by this department and all expense has been born by the commission. It has been our plan to hold monthly scoring contests and we dispose of the butter and cheese after it has been scored and return the proceeds to the exhibitor, less freight or express charges. This is the only expense the exhibitor is subject to,

and all premiums and prizes are awarded by this department. We believe that they have been of unquestionable value to the industry and feel that whatever money is used towards carrying them on is well expended.

EDWARD SLATER,
Commissioner.

St. Paul, Minn.

IN MINNESOTA.

Editor Cheese & Dairy Journal:—

We are glad to note the interest that you are taking in getting a scoring contest started in your state.

All our expenses of the contest, except express on the butter, is paid by the Dairy and Food Commission. The contests are held once a month. The contests as conducted here in Minnesota are giving great educational value to the buttermakers patronizing them regularly.

We hope you will succeed in getting a scoring contest started in your state.

H. P. OLSON,
Editor Dairy Record, St. Paul, Minn.

Now, along with Minnesota, the state of Iowa ranks very close, the honors are pretty nearly equally divided, and whenever Minnesota butter carries away the prizes, Iowa is a close second. This is what the Dairy and Food Commissioner of the state of Iowa has to say concerning their scoring tests:

Editor Cheese and Dairy Journal:—

Our butter contests are held each month, except those months when the State Dairy Association is held, at which meeting butter is also scored. We are able to secure cold storage without expense. That is the butter is shipped to us at a city in the northern part of the state and the local storage firm takes care of it for us. A week later the Assistant Dairy Commissioners arrive and score the butter, criticising the same fully, stenographer in attendance. This score and criticism is sent the maker of the butter and a copy retained by the scorers. They then make an effort to visit each creamery and with the

criticisms in hand point out and correct the defects in methods or appliances.

The expense is the amount of express paid by the sender of the butter. That is we sell the butter for what we can get for it and remit that amount less express charges to the maker. The expense of the scoring and postage and like expenses are a part of the work of this office anyway and the state pays that as it does the other expenses of our men.

H. R. WRIGHT,
Dairy Commissioner.

I read this also from Mr. Shoemaker, the editor of the Creamery Journal, corroborative of what Mr. Wright has said:

IN IOWA.

Editor Cheese and Dairy Journal:

In our state the monthly scoring contest is conducted by the Iowa State Dairy Commissioner, Mr. H. R. Wright.

There really are no funds for use for this purpose, but the only big storage plant in the state kindly donated its use for the twelve scorings, and this has really made it possible to carry on the test.

The butter is sold each month for the best price possible and returns made to the buttermaker.

No prizes are offered except a medal which is to be given by The Creamery Journal. One scoring is held each month.

We feel that these tests have been of great value to the buttermakers of our state, who have displayed more interest in them than in anything of the sort ever before attempted. Furthermore, I have taken occasion to personally keep track of the scores, and in a number of instances have observed that buttermakers, who, on the start, were down to 88 or there abouts have crawled up to a point where their scores are now running in the neighborhood of 95.

E. R. SHOEMAKER,
Editor Creamery Journal.

Waterloo, Iowa.

Now, to cross the lake to the state of Michigan— we are not accustomed to thinking of Michigan as one of the leaders in

the dairy group of states, but if scoring contests are a milestone marking progress, certainly in dairy progress Michigan has got us beat. This is what the Dairy and Food Commissioner of the state of Michigan says:

IN MICHIGAN.

Editor Cheese and Dairy Journal:—

I would say that the educational scoring contests which have been conducted by this department for the past six months are authorized by Act No. 49, Public Acts 1905, of the dairy and food laws of this state. Not until March ninth of this year has this department had the authority to hold these contests. The good results of our work are so apparent that without doubt the contests will be continued. It is the practice of the department to hold these contests monthly in the city of Detroit. Detroit is chosen because of its accessibility to those interested in dairy work. From all sides the department has received words of commendation, and the condition of the trade for Michigan butter in the eastern market at present warrants the claim that the dairy products of Michigan are bringing at least one half cent per pound more, both at home abroad, as a result of these contests. The entire expense is paid by the state, the interpretation of the law being so broad that we are enabled to bring in from outside the state disinterested judges, paying their expenses from the funds appropriated for the department work. It has been the practice of the department to have present at these contests its entire force of dairy inspectors in order that these inspectors may more thoroughly familiarize themselves with the work in hand, and better equip themselves for their duties. The inspectors have been on pay when attending these meetings, their expenses also provided for by the state. This practice, however, will not longer continue since we believe the inspectors have had all such training as should be given them for the present. The work has been under the direct charge of Hon. C. C. Lillie of Coopersville, the Deputy Commissioner of the department. Mr. Lillie is also president of the largest and probably the most successful co-operative creamery in the state.

A. C. Bird,
State Dairy & Food Commissioner.

Lansing, Michigan.

There is testimony from three of our sister states, and I hardly think that we will be willing to yield the palm to any of them as a leader in the dairy business, yet all three of them have outstripped us in acquiring and successfully operating scoring tests.

In the great Empire state of New York,—possibly we can draw a little solace from conditions there and it is said that misery likes company. Mr. Monrad has written us that their attempt in New York to establish scoring tests resulted in their interesting three makers. They volunteered to do all the work and I believe we have practical experience of the same kind in Wisconsin. I think the commissioner here attempted a year ago to get the makers of this state interested, but without success.

Certainly this expert testimony from men who stand at the head of their respective departments in these states can be taken for full measure. If any further evidence is needed, it can be had from almost any source and certainly the verdict cannot be otherwise than that scoring contests are beneficial, and of course are beneficial commensurate to the amount of interest that is taken in them by the individual.

To reply to the second query, whether the desirable results to be gained are commensurate with the time, money and expense of carrying them on, before arguing the point, I take it that every man who engages in the cheese making or butter making profession does so with the aim and object of doing the best he can, of acquiring excellence and efficiency in his chosen work, and if that be true, it seems to me that there is absolutely no question but what he will gain a splendid skill and a record prominent among his fellowmakers and fellowmen by the continuous following of these tests. The maker who exhibits his best product in a contest, brings all of his knowledge and his painstaking care to bear upon the production of that product. He may be careless in ordinary, but in this one instance he exercises the very best care and judgment that he can and even solicits his patrons to assist him in that. He sends his finished product to the scoring tests, and when the returns come in the chances are more than even that he will be disappointed; that he probably had a higher idea of his capabilities than was transmitted to the judges, and the first result of his scoring test will probably be the reduction of the bump of self-conceit to its normal size, but a far more lasting

result will be his determination to profit by the criticisms that have been passed upon his product and to thereafter incorporate them into his very best make. The maker that is made of the right kind of mettle will do that and the next scoring test he enters into, assuming that he has profited by the criticisms made upon his work and from the time that his product leaves his hands he knows he is entitled to a higher score than he received before, everything else being equal, and it is the knowledge of this and the gained power following therefrom that enhances his value to himself and to his employers as a technical cheese or buttermaker. Following this through a continuation of months or years there can only be one result, and that is the constant elimination of the imperfections that were first noticeable in his work as he gradually approaches the limits of perfection.

There is also another element that enters into cheese scoring contests that cannot be overlooked or underestimated, and that is this, the ruling motive in every human being alive is the impulse to excel, and certain it is that the maker who enters his product into these scoring tests does so in a large degree from a desire to excel his fellowmakers, to gain recognition from them, and not only from them as a class but from his fellow citizens, from the community at large. To acquire this, he knows that he must do certain things; he can only produce a finished product by the closest attention to the methods and details of manufacture, by bringing all his knowledge and concentrating it into the finished article which he is producing and throughout it all it is a long, hard road that he must travel if he is going to reach the top of the ladder and there are many who do not reach it. There are those who sit in this audience who do reach it, but they didn't reach it at the first jump.

Another point that must be considered is this, factory managers and factory owners do not hire makers and put them in charge of their factories unless they come possessed of the necessary qualifications, and young men who have sought positions will bear me out in the statement when I say that the maker who produces to his manager and can show, for instance, a little gold medal or a bronze or silver one for that matter, bearing his name with the inscription showing success in a cheese scoring test, finds it worth more than a bushel of gilt-edged recommendations, and that is something to be considered of value to the individual engaged in this work.

There are a great many things that might be said on this subject. There is nothing new that has ever come under my observation. The time for talking is probably past. What we need now is a little action, and I think that this body of men stand on record as being men who are capable of action. I think that the great advances that have been made in the dairy industry in this state in the past are due in some measure to this association and allied associations, and I trust before this convention closes that some concerted action may be taken as a convention that will make toward the fostering and maintaining, the putting on a practical working basis of these scoring tests in this state.

CHEESE SCORING CONTESTS.

J. G. Moore, Madison, Wis.

Assistant Dairy and Food Commissioner.

Mr. President, Members of the Convention, Ladies and Gentlemen: I gave you my views on this subject last year, but there was very little response on your part.

Mr. Rankin drew some comparisons between the policy and the success of the states of Minnesota, Iowa and Michigan, comparing those states with what has been done or can be done in Wisconsin. Now, the conditions in these other states are somewhat different, and I would like to recount them to you a little in order to let you understand a little better why these conditions are what they are and why we have been so backward.

First of all, the Dairy and Food Commission of the state of Minnesota is working under a different plan. The legislature there gives the commission a lump sum of money without any limit to the manner in which it shall be spent. That is not so in Wisconsin; the Dairy and Food Commission cannot spend a cent without there is a warrant in law for it, and so you see we are handicapped and while the Dairy and Food Commission would no doubt be very glad to extend any aid in its power to help the cheesemakers of the state of Wisconsin to hold a scor-

ing contest, so far as we can see now and so far as our interpretation of the law is concerned, it is an utter impossibility for us to furnish money for that purpose as has been done in Minnesota.

There is no doubt in my mind, however, that the buttermakers and the cheesemakers of the state of Wisconsin not only need a scoring contest, but that they would be just as much benefited by it as are the boys in Minnesota, Iowa and Michigan.

We hear a great deal about Minnesota. Minnesota, allow me to tell you, is a little bit overrated. When people want good butter and good cheese, they come to Wisconsin for it. Since I have been secretary of the Wisconsin Butter Makers' Association and since we had our state fair last fall, I am more and more aware of the advantages of advertising, and I can readily see how the policy pursued by the Minnesota Dairy and Food Commission has resulted in advertising that state to the great detriment of the state of Wisconsin. I believe that the esprit de corp existing among the buttermakers and the cheesemakers of Minnesota is mainly due and the credit should be given to the industry of the commission working in among the boys, trying to help them in every way that it is possible for an inspector to do.

Up to this last July, the force furnished by the legislature of this state for this particular work was a very meager quantity. In fact, when you consider that the state of Wisconsin has more creameries and cheese factories than any other state in the Union (and since the first of July they have inspected about 3,010, about 1,800 cheese factories alone), you can readily see that the work of cheese inspectors and creamery inspectors could not be very thorough and couldn't do much good, but since the first of July we have had an addition of ten men to our force and it is up to you to have them help you more in the future than they have in the past. If the butter and cheese makers of the state of Wisconsin desire to hold a scoring contest, there is no doubt that the commission will furnish their aid in this behalf. They can possibly furnish you some help in the way of clerical force and you must understand that the conducting of a scoring contest along the lines it should be carried on in order to give the greatest benefit, will take a vast amount of work. I have no doubt that Commissioner Emery will be willing to stretch a point to help you along that line,

but as far as furnishing any money is concerned, it is an impossibility. We could, however, if we got a contest started in this state, furnish a place in Madison or Milwaukee, in fact, such places have been offered to us before, with cold storage for the product and we can secure judges if you are satisfied with judges inside the state, and you will remember what I said in regard to the outside men who have done such work, but we have excellent men in our state who would, I think, offer their services as judges. You must understand that these men who are competent to act as judges (and that is the only kind we want), are men who are sensitive to criticism, and when they offer their services free of charge, you will see they are making some sacrifice for the cause; not only that, but they have themselves lost money in expenses, and it is hardly fair for them to be subject to the criticism of the makers when it is not due them.

I heard his morning that there was the largest amount of cheese entered at this convention that was ever gotten together in a world's fair or anywhere else, eighty-eight entries. When you consider that we have 1,800 cheese factories in the state, that seems very little to me, and not anything to be proud of, and unless you would do better in holding up such contests as are propesed, it seems to me there is very little prospect of their being very large or successful.

Mr. Monrad: The secretary said it was the largest exhibit of foreign cheese.

Mr. Moore: I misunderstood then, but when you consider eighty-eight entries out of a possible eighteen hundred, it is really a very small percentage. There may be a great many reasons for this small percentage, and I can readily see that many makers are handicapped by unsanitary cheese factories, by poor milk delivered to them and by such complications as we know exist, which prevent their doing better, but we are handicapped in anything we undertake to do, and we want to overcome those difficulties.

We ought to have legislation in this state. When you consider that the dairy industry of this state brings into the state about $55,000,000 or more every year, it is certainly the main industry and should be recognized as such by the legislature, and should be given such aid as will allow the holding of these contests, if they are a desirable thing, and I think that no one will say they are not. Let us try to do our best as individuals,

but above all let us combine our strength in this organization and otherwise, and compel the legislature to be just to us, then there will be no reason why the state of Wisconsin cannot have a contest along the lines that have proved so beneficial in other states.

DISCUSSION.

The Chairman: We would like to hear from some of our Canadian friends about these contests. How is it, Mr. Johnston?

Mr. Johnston: We have done nothing along those lines that I have any record of, either in the east or the west. The only cheese scoring tests that we have have been in our cheese fair the same as you have here, but I believe it would be beneficial. With us, we make up one class of cheese; with you, the different states make a lot of different classes of cheese. I was over in Michigan at one time when the scoring test was on. They brought a New York state man there to score the cheese; he went through two or three lots and threw up the job, he said he couldn't score them at all, but having your cheese score contests and having your judges picked from your own state where one class of cheese is made, your American cheddars, I don't see why it wouldn't do you a great deal of good if you can get the makers interested enough to send their cheese down at their own expense, and if they have the welfare of the cheese industry at heart, I don't see why they shouldn't. I suppose some of them do not get large salaries, and if they have to pay it out of their own pockets, it would be quite an expense, but I think it would be to the interest of the factories themselves to know about this, when it would be brought out what kind of a man their maker was, and it would enable them to gather all the information necessary in regard to the manufacture of cheese.

Mr. Monrad: Don't you have virtually a scoring contest in your syndicate system?

Mr. Johnston: I suppose it is. I might say that at our convention we have a cheese scoring contest but it is confined to the makers. They have a chance to enter and make individual scores themselves. Then prizes are distributed to

those who come nearest to the judges' score in the contest. In regard to our syndicate, our inspectors there act as judges, they go from factory to factory once a month, and they score the makers as a rule if they do not score the cheese, and if they do not score it, the buyers do.

Mr. Moore: At the Wisconsin Butter Makers' Convention, which is to be held next week in Madison, we have a premium fund of $1,122.57, the largest ever offered in a state organization. Now, how did we obtain this? The major portion of it was subscribed by the buttermakers themselves, and the way they did it I think would be valuable among your cheesemakers. Our boys sent butter to the convention to be scored and the butter winning prizes is sold and that fund used for the next year's fund. Last year the butter sold at Fond du Lac brought $800, and after paying all expenses, we had some $560 left for this year's premium fund and we are hoping for a very large exhibit of butter.

THE MANUFACTURE OF BRICK CHEESE.

FRED WUETHRICH, Mayville, Wis.

The subject on which I have been requested to prepare a paper by our secretary, Mr. Baer, is the manufacture of brick cheese. While I realize that this is an important topic, I feel that almost everyone who is directly interested in the manufacture of brick cheese as it is carried on to-day, is just about as familiar with the subject as I am. I will, however, specify a few points which I consider of importance in the manufacture of brick cheese, and, by so doing I may be able to impart some ideas of value to someone who has met with difficulties along this line.

Brick cheese making of to-day is not any more the simple coagulation of the milk and the cooking of the curd as it probably was years ago, but it requires skill and study by the maker of all questions connected with the making of brick cheese. To begin with it is necessary for us to go back to the farm where the milk is produced. The brick cheesemaker

first of all things should teach his patrons the necessity of having all dairy utensils and surroundings of the barn in a clean and sanitary condition, as cleanliness is the cornerstone for the successful manufacture of brick cheese as well as all dairy products.

I also consider it of great importance that the farmer should be taught to treat his cows gently and not to chase his dogs after them when bringing them home from the pasture, but to allow them to walk home with ease and comfort. If the milk cow is chased all over the field just before milking time the chances are that the cow will be in a heated and excited condition and such milk is liable to form a certain gas germ and the consequence is a more or less gassy cheese. Regularity in milking is also of great importance. The cow stable should always be kept as clean as possible, the milk cans should not be left standing in the barn while milking, but should be kept where it is clean and no smell of the barn can get at it and before the milk is poured into the can it should be strained and aerated or run over a cooler, as this will take out the dirt and the animal heat. There are some old cheesemakers who do not want the farmers to strain the milk before it is delivered to the factory. This, however, is entirely wrong. They say they cannot tell whether there are any curd lumps in the milk, but if the farmer is honest he will see that himself by straining and will not send such milk to the factory and of course all farmers *ought* to be honest.

One great fault among brick cheese factory owners is that they do not pay according to test but pay by the hundred. Steps should immediately be taken to remedy this and all cheesemakers should pay according to test. If we keep on paying for milk by the hundred I believe that farmers will become more and more apt to keep such cows as Holstein cows that produce quantity of milk rather than quality and we all know that the best cheese is made from milk testing between 4 and 4.5. It is a known fact that the average milk obtained from Holstein cows is not as rich in butterfat as that from any other breed. It is also a known fact that the best cheese is made in fall when the test is highest.

Now in order to induce the patrons to adhere to this principle of cleanliness the cheesemaker should set them a good example at his factory, in keeping every thing there as clean as possible. Mr. Emery and his inspectors of the dairy and

food commission have accomplished wonders during this last year along this line of cleanliness in factories and we hope that this good work will be continued. The next thing for them to do is to go after the farmer as he would sooner obey an inspector than he would the cheesemaker, for in order to make good cheese it is necessary to have good milk. The cheesemaker, therefore, should be very careful when he takes in the milk, tell the farmers to clean their cans with some good washing powder and reject all milk which he does not find in good condition. Particular care should be taken where the milk is delivered only once a day during the summer that no sour milk is accepted, for if such milk is used for making brick cheese it will become brittle and have a sour flavor, something that is not wanted in brick cheese.

Milk for making brick cheese should not contain more than from .15 to .18% acidity. A starter should always be used where milk is delivered twice a day, in fact I believe in order to get a uniform cheese it is of great value to use a starter for all milk, especially so where they have trouble with gassy milk. If a good starter is used the lactic acid germs will overrule the gas germs. I would advise the use of about from ½ to 1 per cent for milk delivered twice a day, and ¼ to ½ per cent for milk delivered only once a day; of course this percentage depends somewhat on the condition of the milk. Now in case the cheesemaker notices that the cheese commences to huff or blow up, due from gassy milk, the Wisconsin curd test should be applied at once and after you have located the farmer who brought the poor milk a curd test should be made of the individual cow or cows. By doing this a great deal of trouble and worry by the maker can be avoided and it will also prevent a loss in the sale of cheese.

After the milk is all received it is warmed up to from 88 to 95 degrees F., depending upon the season of the year and the condition of the weather and the milk. It is a good plan to use the rennet test the same as they do for American cheese making in order to ascertain the acidity of the milk and I think that by doing this a more uniform cheese can be made and the maker would know exactly how to handle his curd. The milk should be coagulated in about from 25 to 30 minutes. If too much rennet is used we will get a quicker curing cheese, but such cheese would not do for storage as it will become soft and will have a tendency to take a limburger flavor

as it gets older. After the milk is nice and thick and will break easily over the finger it is ready to be cut, first with a horizontal knife lengthwise and then with a perpendicular knife both ways. Next let it stand for about five minutes and cut once more with the perpendicular knife both ways; and after that comence to stir slowly with the so-called curd scoop. Stir about five minutes and then use the rake, stir again for about from five to fifteen minutes, depending somewhat upon the condition of the milk and the season. Steam is then applied under continuous stirring until it has reached the required temperature which is about 110 to 130 degrees F., also depending upon the condition of the milk and the season of the year. Care should be taken in no heating too fast as only the outside of the curd granules will cook and the inside will stay milky. After reaching the required temperature it is stirred until the maker finds it firm enough to draw off the whey. I think it would be a good plan to pasteurize the whey as it is drawn. Of course this would not be of any benefit unless the whey tank is cleaned out daily. Sufficient whey should be left on the curd to prevent it from matting together and it will be of some benefit to add a little salt to the curd in the vat as this will check the lactic acid fermentation. After the cheese is dipped into the moulds and pressed it should be turned enough to get it sufficiently dry within twenty-four hours, after which it is put on the salt table. Care should be taken in salting. Too little salt will make wet and smeary cheese and cause the outside to rot; if it has not enough salt when taken from the salting table a little may be sprinkled over it while it is lying on the shelf. It should be washed often enough to keep it from getting mouldy and dry.

Now the cellar should also be clean as well as the make room and all utensils used for making cheese. It should be whitewashed at least once a year and shelves and floor should be cleaned as often as necessary. The right temperature for curing of brick cheese is about from 60 to 68 degrees F.

I think the next thing for the Dairy and Food Inspectors to do is to introduce the Commercial Starter, the Wisconsin Curd Test and the Rennet Test. If all things are applied in the manufacture of brick cheese, I am confident that the poor quality of cheese will be reduced to a minimum and Wisconsin will not only deserve the name for making the best American cheese, but also the name for making the best foreign cheese.

DISCUSSION.

Mr. Noyes: How much acid do you develop for the manufacture of brick cheese?

Mr. Wuethrich: It should not have more than .15%. You are liable to get sour cheese if you have more.

Mr. Noyes: You think it is desirable to have some acid in the milk?

Mr. Wuethrich: Yes, I think so. I think it would be desirable to use a good starter.

Mr. Noyes: If the milk was gassy, you would certainly use a starter, wouldn't you?

Mr. Weuthrich: I would use a little starter and I would work it a little faster than I would otherwise.

A Member: In applying the rennet test, at what point would you consider the milk ripe?

Mr. Wuethrich: I have never used the rennet test in making brick cheese, but I think it would be advisable to use it.

Mr. Noyes: We have three or four kinds of rennet tests. A man must acquire the knowledge of using a certain one, or using them all. He has got to know how it works. You take the Monrad, the Harris or the Marshall, they are all worked differently, and every factory works a little differently, and the maker has got to have a knowledge in using any of those rennet tests to know when to set it, whether by the second or by the space or how it is.

The Chairman: Some of us American cheesemakers would eat a good deal more brick cheese than we do if we knew where we could get it.

Mr. Noyes: How much starter would you use for a thousand pounds?

Mr. Wuethrich: I would use about fifteen pounds.

The Chairman: Do your patrons strain their milk?

Mr. Wuerthrich: We are preaching that to them right along, and most all of them do. We are getting out pretty clean work.

Mr. Monrad: How much moisture do you have in your curing room?

Mr. Wuethrich: I couldn't say; we have a pretty moist curing room. The cellar used to be a beer cellar years ago, and it makes a very good brick cheese curing room.

The Chairman: Is there anybody here can tell us the per cent of moisture he likes to have in his curing room?

Mr. Noyes: At the university, we have about 90 per cent on the average, all the saturation that the air will carry. We could carry a little more if we had a little more circulation in our curing rooms.

Mr. Monrad: At what temperature?

Mr. Noyes: About 60–62.

A Member: You speak of cooking the curd up to 130 Fahr. Do you mean that degree of temperature should be applied to a good curd or to a gassy curd?

Mr. Wuethrich: It has got to be heated enough in order to get it firm enough. Last fall we used to heat the curd up to 135 in order to get it firm enough. We took the milk in once a day. The milk is not in quite as good condition as when delivered daily. We use a starter.

Mr. Noyes: These soft bricks that we see around the country that are open, soft, that is due to the cook, isn't it, more than the curing?

Mr. Wuethrich: I think it is due somewhat to the gas in the milk, and to the process of making of the cheese.

Mr. Noyes: What effect has salt upon that? Would you salt that brick cheese heavier if you knew you had that kind of cheese?

Mr. Wuethrich: No, I don't think the salt would have any effect on the quality of it.

Mr. Noyes: Don't you think it would make it a little harder, firmer?

Mr. Wuethrich: I don't think so. Of course the poor cheese does not take up the salt as readily as the good cheese, therefore it has to be salted a little heavier.

Mr. Berg: How can you tell whether a brick cheese is salted enough, after it is on the shelf, without trying it?

Mr. Wuethrich: The cheesemaker learns that by experience. Of course he couldn't tell exactly, but you can guess it pretty nearly right. We salt the curd in the vat and three times on the salting table, and that is sufficient. It is salted in the whey in the vat a little bit.

Mr. Berg: What grade of salt do you use in salting brick cheese?

Mr. Wuethrich: We use Colonial Brick Cheese salt.

A Member: Did you ever use just common salt?

Mr. Wuethrich: Yes, we did, we find the Colonial salt is better.

Question: Cheese salt would be a little bit too strong, wouldn't it?

Mr. Wuethrich: I couldn't say, I never had any experience with it.

A Member: It melts too fast, that is the trouble. You have to have a specially coarse grained salt for brick cheese, one that will melt slowly. How long would you leave brick cheese in the mould after it is bloated?

Mr. Wuethrich: I would take them out of the mould as soon as I could. I don't think it is any use to leave them in the mould any longer than say in the afternoon some time.

A Member: Do you think that pressing a cheese when it bloats will help it any?

Mr. Wuethrich: No, when it gets out of shape I would take it out of the mold at once.

A Member: A gassy cheese has a natural tendency to retain moisture. If there would be some method to get that moisture out, wouldn't it be an improvement to your cheese?

Mr. Wuethrich: I think so. Of course if the cheese was very bad, we would cut it with the curd mill and make it over and make a pretty good article out of it, warm it up and repress it.

Mr. Monrad: Don't your salt remove some of the moisture?

Mr. Wuethrich: Oh, yes, the salt will remove the whey, the moisture.

A Member: I know people who salt brick cheese in the tank with salt water right along and it seems to work alright.

Another Member: I have seen that done, but I think it is best to salt it dry.

Another Member: I have had a little experience with huffy brick cheese and I would take it down cellar as quick as I could and salt it and this salt checks the fermentation, but if I saw by the looks of the cheese that it was going to huff bad, and you can tell in a short time, it breaks out of the boxes, I would just let it huff until about six o'clock in the evening until it gets done, then I would take the curd mill and grind it all up again, wash it out with water at 112 degrees and put that back in the mold and I have a good solid cheese.

A Member: Then it will resemble very closely American cheese in its flavor.

A Member: It will not have as good a flavor as it had at first, but it won't huff the second time, at least I never had any that did.

A Member: Would you put that curd to press dry after grinding it?

The Member: Yes, I put it just as it was after I washed it, the same as if I was dipping it out of the vat at first. I simply pour on enough water to nicely wash it, and I find when I drain off the water I always have a good solid cheese. It decreases the yield to wash out a good deal of the fat, and of course when you take the fat away it decreases the capacity for retaining moisture.

Question: Would not the cheese be better if it was cooked at 103 or 104?

Mr. Wuethrich: I don't cook it, I wash it at 112.

Mr. DeLand: Why wouldn't it be well to salt the cheese in the curd sufficient to get the proper flavor, I mean in the vat?

Mr. Wuethrich: You would have to use so much salt.

Mr. De Land: Well, it is cheap.

Mr. Monrad: There is where the action of salt comes in. By salting on the outside this slow melting salt withdraws a lot of moisture. If you put the salt in your cheese, it does not have the same effect.

The Chairman: Yes, it does.

Mr. Noyes: You take an American cheese and oversalt it, and you have got a mealy, dry cheese.

Mr. Monrad: Now, you compare two things that are different.

The Chairman: If you put salt on an American cheese curd it always draws the water out.

Mr. De Land: The object of salting American cheese is simply for flavor. Now, isn't that true with the brick cheese? Brick cheese made as he states will be flatter than our cheddar plan of making American cheese. I have made cheese and put one part in a vat and salted it as usual, the other part I have pressed and made cheese of without any salt whatever. Now, so far as the taste is concerned, the salted cheese was of a better flavor, but there was absolutely no difference in the texture. Now, why can't we salt brick cheese just sufficient to give it a flavor?

Mr. Noyes: You must consider the keeping quality.

Mr. De Land: Salt does not preserve a cheese, I know that, for I have kept an unsalted cheese, and it keeps the longer, but it doesn't have as good flavor as a salted cheese. The only reason for salting cheese is to give it flavor just as the only reason you put salt on your potato is to give it flavor.

Mr. Monrad: You see, Mr. Noyes, in applying your salt in the Aemrican system, you give it time for draining off. The salt is practically applied upon the curd particles in your vat and you give it a long time for draining, and while it is doing that it draws out the moisture from the curd particles. With brick cheese we immediately put it in the mold. You do not give it time and the action is different. You can't compare those two systems.

Mr. Noyes: You cannot get the same results to salt the curd as to salt the cheese.

The Chairman: You don't want to.

Mr. Moore: I assume from the fact that your secretary has placed upon the program for the last two years an article regarding this cheese scoring contest that there must have been some interest in it. I do not feel satisfied with the way that subject was left here, and at the suggestion of Mr. Monrad, I ask an expression of opinion as to how many cheesemakers here would enter such a contest if it was started. Won't you please hold up your hands? Well, there are over fifty. Now, Mr. President, in view of this expression at this time, I would like to move the adopt ion of a resolution as follows:

"*Resolved,* That we, the Wisconsin Cheese Makers' Association. are in hearty sympathy with the project of holding cheese scoring contests and hereby pledge our support to such contest if one can be started."

Motion seconded, put to the house and carried unanimously.

PREPARATION AND PROPOGATION OF STARTOLINE AND STARTERS.

MARTIN H. MEYER, Madison, Wis.

Instructor in Butter Making, Wisconsin Dairy School.

It is a cause for special pride that the Wisconsin Cheese Makers' Association is the largest of its kind in the world. We are prouder still of the fact that it has as members the best cheesemakers of the United States. But we are proudest of all, gentlemen, of the fact that this association has lifted the state of Wisconsin from the low plane in the line of cheesemaking which it has occupied, due to the irresponsible makers of filled cheese, to its present position as a banner cheese state. You all remember what occurred at the World's Fair in St. Louis in 1904. That Wisconsin cheese received the highest score is proof of your ability as cheesemakers. Still, though you have achieved such splendid success, no one will deny that there is still room for improvement in the quality of the average cheese. To raise the quality of average cheese we evidently need to follow the methods of the makers of first class cheese. One of the most important things among these is the propogation and care of the starter, for upon this will largely depend the quality of the cheese.

Among the modern improvements and developments in the art of cheese making, there is perhaps no other one factor which influences the product to a greater extent than the use of a good commercial starter. Recent experience seems to demonstrate the fact that the successfully prepared and properly used starter is invaluable in modern chedder cheese making. It is today a universally recognized fact among up-to-date cheesemakers that a good starter is one of the main factors controlling abnormal fermentations in cheese. Experiments by Prof.F. C. Harrison show that gas-producing bacteria produce a bad odor and flavor and also cause a mottled appearance in cheese. The latter being probably due to the bleaching action of the gases generated by these undesirable organisms. When these gas-producing bacteria are present the good effect of a lactic acid starter is very noticeable and causes a great improvement in the flavor and appearance of the cheese. We know that when

ever abnormal fermentations predominate, the flavor and texture are, to a greater or less extent impaired. Therefore it is evident that some controlling factor is essential, when we consider that in some cases cheddar cheese has been known to actually *walk off the shelves.* It is necessary then in order that this stage of the development of abnormal fermentation may not be reached, that something be done to prevent it.

Let us consider first, what these microscopic organisms which control the undesirable fermentations are, how they are obtained and how propogated. They are very delicate little plants which will grow well under favorable conditions and die under unfavorable ones. These little lactic-acid bacteria are selected in laboratories and grown under the most favorable conditions of temperature and moisture. When the proper conditions of growth are reached, and the bacteria have the desired lactic acid producing qualities, a quantity sufficient for making a startoline is mixedwith a sterile solution or powder and put up in small bottles for shipment. The contents of these bottles now take the name of "Commercial Culture," "Butter Culture," "Lactic Ferment," etc.

There are today a number of commercial cultures on the market. The Douglas Company of Boston, Mass., sends out three different cultures: "The Boston Butter Culture," "Lactic Acid Culture" and "Duplex Culture." S. C. Kieth of Charleston, Mass., also sends out three cultures, bearing the same names as those of the Douglas Company. Some others are: "Elgin Butter Culture," handled by the Creamery Package Company of Chicago, "Ericsson Culture," manufactured by Elov. Ericsson, Mankato, Minn., "Hansen's Lactic Ferent," manufactured at Little Falls, N. Y., and Park Davis & Co's. "Flavorone," manufactured in Detroit, Mich.

As cold does not spoil or kill these little plants, and heat does, it is very necessary to exercise the utmost care, in order that the culture does not get overheated. It should always be kept in a cool place until needed for immediate use.

The preparation of milk for the propagation of a pure culture is very simple. Select two quarts of good sweet whole milk (unless separator skimmed milk is obtainable, in which case it should be used in preference to whole milk), heat it in water to 185 or 200 degrees F., and hold it at this temperature for about thirty minutes or longer. Then cool quickly to about 70 or 80 degrees F. Now get your little bottle of pure cul-

ture, clean the sealing wax carefully from the neck of the bottle and empty the contents into the pasteurized milk. Carefully close the jar or vessel containing the milk and shake it at intervals of five minutes for about an hour. Then let it stand at a temperature a little above 70 degrees F., until nicely coagulated. When this stage is reached you no longer have a pure culture, as applied to starters, but the preparation now takes the name of startoline and has the age of one generation. A startoline then is a mother starter, and every continuous propagation adds one generation to its age, a generation being one souring, renewal or propagation. If the startoline is propagated every day for thirty consecutive days, you have a startoline of the thirtieth generation. This startoline or mother starter must be very carefully t aken care of in order that it may produce good results. Frank Bowar of Cazenovia, Wis., whose butter scored 98 at the Wisconsin State Fair 1905 says: "The care of my startoline and starter amounts to nearly as much as all my other creamery work." However, we need not be alarmed. It may not always require as much time as that. I do however, wish to emphasize the fact that it takes persistent, well directed care to keep the startoline in good condition. Whenever obtainable glassware should be used in growing the startoline, because when glassware is cleaned and sterilized it may be stoppered and left for a day or longer without acquiring a bad odor. The only smell which would manifest itself upon opening a glass vessel which has been closed for some time would be a dead-air smell. This is not the case with a tin vessel, for no matter how carefully cleaned and sterilized it may be, if it be closed tightly for 12 hours or less, upon opening it, a very offensive odor is noticeable, somewhat resembling rotten milk or an old tin can. Due to contamination from this source, all tinware for growing the startoline should be discarded wherever used, and should be replaced by glass vessels. A few glass quart jars with glass stoppers if obtainable, in addition to utensils already at hand, are all that will be needed for the handling of the startoline. The glass jars can very easily be sterilized either by boiling them for five minutes or by applying live steam to them.

Prof. E. F. Pernot of the Oregon Experiment Station in bulletin No. 83 of December, 1904, gives a method used by the dairy students of that college. By Prof. Pernot's method the startoline has been perpetuated for three months, and at the

end of that time it still retained its original purity. But, however crude our methods, and however limited our knowledge may be today in the handling of cultures, I believe that by following closely a few simple rules we ought not to fail to achieve good results.

As we have already seen, we obtain our startoline by inoculating sterilized milk with a pure culture, and allowing it to coagulate. For the perpetuating of the startoline the milk may be taken daily from the can of milk pasteurized for the starter. Having the pasteurized milk and the startoline vessels ready, break the coagulated starter up thoroughly, add from 1/3 to 2% of startoline to every can and fill with pasteurized milk to within an inch from the top. This space at the top of the bottle is to allow the contents to be thoroughly shaken. After adding the milk to the startoline, shake up well and set it at a temperature of about 70 degrees F. This is our second generation and should not be grown at a temperature lower than 70 degrees F. because the little plants cannot produce the desired flavor when grown at a much lower temperature than 70 degrees for the first three generations. With most cultures the first three generations are not fit to be used for starter making as the media in which the germs are sent out impart a peculiar odor to the startoline; therefore it should not be used for starter making until free from such odors. The per cent of startoline necessary to be used from day to day for the propagation and perpetuation of the startoline is governed by the strength and condition of the startoline used, the temperature of the room, the time allowed for its growth until it is to be used, and the possible variation of room temperature. In ordinary room temperature (70 degrees F.) the milk, when ½ to 2% of startoline is used, should be well coagulated after the lapse of from 10 to 16 hours, and should have an acidity of from .55 to .75 of one per cent. Should there be danger of the startoline getting overripe before it is to be used, shake it up well, pour some out and add enough pasteurized milk to fill the vessel. This will lower the acidity and give the lactic acid germs a chance to multiply and retain their vitality, which is so essential in growing a good startoline.

The care to be exercised in selecting, heating and cooling milk for the starter is not necessarily different from that exercised in the handling of the milk for the startoline. The can

or cans used for the making of the starter should be well tinned and all seams should be smooth, to allow it to be easily and thoroughly cleaned. Old cans, especially when the tin is worn off, or if they are somewhat rusty will impart a "tin-can flavor" to the milk, which will affect the flavor of the starter and impair its usefulness. The per cent of startoline necessary to be added to the starter milk to have it ready for use at a certain time depends *first,* on the temperature of the starter milk when startoline is added; *second,* on the average temperature at which the milk will be kept during the ripening period; *third,* on the average temperature of the room; *fourth,* on the time allowed for the starter to ripen before it is to be used; *fifth,* on the vigor and acidity of the startoline, and *sixth,* on the faculty of the startoline to produce acidity under variations in temperature. Being influenced by these conditions and the kind of culture used the average temperature at which the starter can be grown may vary from 62 to 68 degrees F. with practically the same results.

When the starter is at the point of coagulation at a temperature higher than 63 or 64 degrees F. and is not to be used at once, immediate cooling is imperative, since the starter is likely to become overripe and whey off, a condition in which a starter is almost unfit for use, as its action is greatly impaired by this condition and the effect which it should produce on milk for cheese making is partly or even in some cases wholly destroyed. It is a good plan to see to it that the starter coagulates at a temperature lower than 64 degrees if not to be used at once, since when coagulation takes place at a comparatively low temperature the texture of the starter is more likely to be loose and silky. When in this condition it will when poured have the appearance of nicely ripened cream, leave no streaks or show specks or particles of curd. Starters grown at too low temperatures and for too long a period of time invariably develop sour, slightly bitter, rank or flat flavors, and will if the startoline is saved out from the starter, under such conditions impair its future usefulness for perpetuation. It is perhaps needless for me to say that the startoline should not be saved out from the starter. During the hot season the starter should not be inoculated in the morning for the next morning's use, since when it has developed quite a degree of acidity it is difficult to prevent its becoming overripe. When the starter milk is inoculated in the evening, the startoline hav-

ing the proper temperature and acidity, the starter will as a rule, be in good condition when needed in the morning. During cool weather, however, there is not much danger of the starter spoiling when set in the morning and cooled before evening.

It is a good practice to propagate your startoline every day, even though the starter is used only every alternate day. When coagulation has taken place at a comparatively low temperature the starter and startoline if kept cold may be preserved for several days without having their good qualities materially impaired. When under these conditions the startoline or starter may even be shaken up and preserved for several days without wheying off.. It must however be borne in mind that these conditions exist only when coagulation has taken place at a comparatively low temperature.

The startoline and starter should be judged by smell, taste and appearance. They should have a clean sour-milk smell, a clean acid taste, be free from all cheesy or curdy taints, free from lumps and smooth when broken up.

When a culture produces a low acidity and a sweet flavor in the starter this can be remedied by ripening the starter to a higher degree of acidity for several days. Also if the culture is slow in coagulating the milk, you will find it will improve in activity by ripening the starter at a temperature higher than usual and using a large quantity of startoline for some two or three inoculations. The slowest culture can in this way be made more active in a few days. If a starter is too acid in flavor it can be brought back to a mild pleasant flavor by ripening it to a low acidity. This is especially noticeable if the starter is cooled to below 56 degrees while still sweet after the inoculation, and kept cool for about 6 to 12 hours. It is then to be heated to about 75 degrees F. in order to quickly coagulate it, when it will be found to have a mild pleasant taste. When this process is used the starter must be used as soon as coagulated because there is danger of it wheying off if allowed to stand.

Instances are known in cheese factories where, to save work, sour whey is dipped from the whey tank and put into the milk for a starter. Another method of having a starter without much trouble is also used. It is as follows: The starter can is not washed after the starter is taken out of it, more milk is put into it and it is left to sour in the filthy can as best it may

to be used next morning. More milk is again put in and the same thing is repeated from day to day. The principle is that enough "startoline" adheres to the can to sour the milk by the next morning. Imagine a can used day after day without being washed! It seems that no one could suggest a filthier method than this, and such methods should of course be condemned upon the slightest knowledge of their existence. Is is any wonder when such mthods are still in use that there is so much poor cheese on the market? Imagine the condition of the above mentioned starter in the hot season! The can uncovered and totally unprotected from dust and flies. As flies are mainly attracted to objects by their sense of smell, the strong-smelling starter attracts them in great numbers to refresh themselves. We can easily imagine how many of them meet their death by drowning. Of course great numbers finish their meal and depart in peace, but have left behind them innumerable bacteria. Regarding this matter Prof. F. C. Harrison of Ontario Agricultural College, in bulletin No. 41, says: "Single flies were placed in test tubes containing a measured quantity of sterilized water and well shaken. This water on analysis was found to contain large quantities of gas-producing bacteria. Frequently 50,000 bacteria were obtained from a single fly, and of these over 20,000 were gas-producing." Imagine then, if you can the great number of bacteria which the starter previously referred to must contain. Even the best of milk would be ruined by the addition of such a starter.

A very simple arrangement for handling the startoline and starter, and one which every cheese factory could have consists of a heavily made wooden tank with steam and water connections and an overflow pipe. This tank should be large enough to hold the starter cans and the startoline jars, or whatever vessels are used for startoline. A wooden rack should be placed in the tank to keep the cans in place, and under part of the rack a wire netting should be placed to prevent the startoline jars sinking to the bottom of the tank. By such an arrangement both the startoline and starter could be cared for with almost the same amount of work as that required for the care of one of them. By this system the temperature can more easily be controlled and better results can be obtained. It certainly is much superior to the commonly-used method of letting the starter can stand in room temperature or placing it in a can of water. Radiation of heat is much less when wood

is used instead of metal as a protector. What I consider an ideal method for handling startoline is as follows: Have a tank made especially for the purpose, similar to the one just described, only have it heavily zinc-lined, with a metal rack for holding the startoline jars in place. There should be three startoline jars, and three cans for heating the milk for the startoline. I should want three cans because in order to perpetuate a startoline and preserve its purity, the milk should be heated more than once. By having three cans the milk for the startoline can be heated three successive times before it is to be used, and in this way can be or is, made practically sterile. For instance, the first day all three cans are heated, the contents of one can is used, and the can refilled. Next day the three cans are heated again and the second can is used and refilled. Next day they are heated and the third can used. So after the first two days we can always have a can of milk which has been heated three times. The heating should be done by means of hot water rather than by direct steam as there is less danger of the milk scalding unto the sides of the cans when water is used than when steam is applied directly to them.

While methods of handling a startoline or starter may vary considerably under different conditions, we must bear in mind that in this as in most other things, the fundamental principles must be adhered to.

I thank you for your attention.

DISCUSSION.

Mr. Dassow: What is the object of heating the milk three times? I understood it was heated once a day for three days.

Mr. Meyer: That milk is heated once. First, you kill mostly all the germs and by keeping that milk at the proper temperature, it will not deteriorate. The next day heat it to about 180 degrees, about half an hour. Then that milk can be held at as low as 50 degrees or even 60 or a little higher, so that the spores that are left can again grow and sprout and the next day be killed. It could be kept practically indefinitely, providing infection be excluded. That is the milk for the startoline. You don't want to confuse the startoline with the

starter. The startoline is a small quantity of milk to be used to grow the startoline in and used to inoculate the milk for the starter. It was not the starter milk that was to be heated three times, but the startoline milk.

The Chairman: What do you think of porcelain lined cans for the starter?

Mr. Meyer: I should think they would be very good if well taken care of so that the porcelain will not crack.

Mr. Moore: Do you advocate taking off the top inch of the starter before adding it to the milk or cream?

Mr. Meyer: Yes, I would under certain conditions. It depends on the kind of can you have. You must exercise great care in skimming it.

The Chairman: Why is it desirable to skim off the top and discard it?

Mr. Meyer: It would be desirable on account of the infection that might take place in the upper layers after the milk starts to coagulate, but before that time those germs that enter the milk go down to the bottom. I would rather take good care of the whole process and use it as a whole.

The Chairman: A starter can then should be so covered that nothing can fall into it?

Mr. Meyer: Oh, yes, a startoline can should have a good cover, the starter can also, otherwise you cannot keep it from infection.

Mr. McCready: Do you think it desirable to recommend the addition of hot water or steam directly into the milk instead of heating it from the outside?

Mr. Meyer: I would not advise the injecting of steam directly into the milk. That is simply putting infection into the sterilizing process.

The Chairman: How do you understand that live steam is infectious?

Mr. Meyer: It is not due to the steam itself, but to the holes in the pipes where the steam comes through, and of a peculiar odor that always exists in steam from boilers. We know that germs do exist in such a pipe and they might gain entrance into the milk.

The Chairman: At what stage of the game would you reserve the startoline from the starter?

Mr. Meyer: As a rule I would not reserve the startoline out of the starter. I would try to educate myself to carry

them separately, I would exercise great care to have close jars, some vessel that I could keep clean well and carry them separately. I would under no conditions take the startoline out of the starter, because, no matter how careful you are, a little infection takes place every day and by preserving these jars every day some infection will be added, while by growing it separately in small cans we can better take care of it than we can with a big can. I would advise growing them separately.

A Member: How much would you put into, say, a two-quart glass fruit jar?

Mr. Meyer: If I was in the habit of carrying them over night, I would add about one per cent of whatever vessel I might use. If I was in the habit of carrying them during the day I would add such a per cent of startoline to my startoline milk as would coagulate during that time, and then I would put it in chipped ice and keep it over night. But the trouble is cheese factories, as a rule, have no ice, and there the danger is of getting the startoline too ripe. Now, if you have this little tank where you have three cans, each for startoline purposes, and three cans for growing startoline, you can handle it at every stage. I would advise this system, then you can take one can and as soon as it is ripe inoculate the other can, and then you can keep this system going around.

Mr. Noyes: Would you advise adding water to the startoline the night before, say, one third or one quarter, directly into the starter?

Mr. Meyer: Provided you do not use a starter to save out your startoline, there, perhaps, may not be much objection to adding some good clean water, but if I was in the habit of doing that and found that it gave me good results, I would try to heat the water and add some of that, and it would save the starter from getting too sharp an acid flavor. I have not treated this particular subject, because it more refers to the buttermaker. I have used water in making starters and found it works quite nicely, especially when you want to inoculate a starter early in the day by adding some water before you sterilize the milk and the starter will not get so overripe and not have this sharp acid flavor, and in some respects it breaks up somewhat easier and is smoother. I have used as high as 30 per cent of water in unpasteurized milk and then pasteurized the whole of it. Of course you must never add the water after you have pasteurized.

Mr. Moore: Do you advocate the continued stirring of your starter for, say an hour, or would you let it alone?

Mr. Meyer: I wouldn't stir it not so very long. By adding the startoline, you can in five minutes stir it as well as it needs to be stirred, but when you fix up the pure culture I would shake it at intervals of every five minutes for half an hour in order to get a good mixture.

Mr. DeLand: Would you advocate the use of a starter made in any other way than what you have suggested, for instance, a can of milk taken from a good neighbor across the way and left to stand in the factory or in a basement cellar for a day or two, would you call that a starter, providing you did not have this better way?

Mr. Meyer: No, I would not under any circumstances use that. I have not touched on natural starters as they are not generally used. As far as natural starters are concerned, if you can get good sweet milk from a healthy cow and all other things for handling in good condition, you can perhaps grow nearly as good a starter as from commercial cultures, but you have not the same control and of course the natural starter will run out quicker, due to the foreign germs that gain entrance during the process of milking, etc., no matter how careful we may be. The cow whose milk is used should be in milk about from three to four months, I would under no circumstances take milk from a cow that had been six months or seven months in lactation.

A Member: Would you leave the cover on the can?

Mr. Meyer: That is a matter of minor importance. By having the can open, circulation of air is always taking place and you might as well make it worse instead of better, because as soon as you stop, those germs that had access five minutes before it was closed, will develop, and they will cause you trouble. The point is not to take any milk for a starter that needs aerating.

Mr. Noyes: Did you ever take whey, sterilize it, put in the starter and use that?

Mr. Meyer: I haven't any experience in cheese making and I don't know what could be done with that, but I suppose by pasteurizing the whey and adding a commercial culture to it, you might, perhaps, get good results.

Mr. Noyes: We have done that in the dairy school with good results. Of course it took a larger per cent of it to ac-

quire the same amount of acid than with another starter, but we have had good results. Those cheese will be scored a little lower only.

Mr. Michels: Do you find any trouble with commercial starters?

Mr. Meyer: Well, yes. I have handled quite a few from different firms, and find a great difference; in fact, so much so that I could not use some of them. I have had some that had an awfully disagreeable strong odor that would sour the cream and show quite an acidity, and yet be sweet to the taste, which is very undesirable in butter making and I suppose would have a very detrimental effect on flavors in cheese. We had some that had an old flavor. I have also noticed that cultures that were too old were no good. I would rather take natural milk and believe I would have better results than from old cultures. By that I mean, a pure culture beyond age before it has been used. That is, if they are not used when they are comparatively fresh they simply develop these off odors.

Mr. Dassow: How are we going to tell whether they are old?

Mr. Meyer: When they are old the startoline has a bad smell; somewhat dull, flat and disagreeable.

Mr. Dassow: How can you tell before you buy it?

Mr. Meyer: You can't tell it before you buy it. There are of course quite a few firms that put the date on and you can easily calculate that they should not be used beyond a certain date. Where they haven't got the date on, you have to trust to their honesty.

Mr. Dassow: Do I understand that you keep your starter tightly closed?

Mr. Meyer: Yes, I would keep it as tightly covered as I could. I would have a cover made that was tight, because you know the air circulates through, no matter how small the crevices are, and that affects the contents.

Mr. Dassow: Would you keep the can covered while heating the milk?

Mr. Meyer: Yes, I would. I would cover the milk as soon as I got it in and leave it covered. That you can do if you are using the small can, turn it right into the hot water. Where you have to use a hand stirrer, you have to uncover it of course, unless you have some special arrangement going through the cover, but the can should be kept covered any way.

I think it is very important to keep it stirred while the heating is going on. We all know it is a pretty hard thing to get a uniform temperature from heating in hot water, but by keeping it stirred it will heat more uniformly.

Mr. Michels: Do you use the cans put upon the market for that purpose, or an ordinary can?

Mr. Meyer: It will somewhat depend upon the quantity of starter necessary to be used in the factory. You can get quite small sized starter cans and I would prefer them, although they would need some arrangement for stirring. If I couldn't have those I would take a common can or have one specially made with a tight cover and with a stirrer going through the cover, and then keep it closed tightly during the sterilizing process.

The Chairman: I take it from your remarks that tin is not the proper material for a starter can.

Mr. Meyer: As far as the starter can is concerned, it is not so bad, because the starter is used once, it is grown and used. But the startoline is propagated day after day and from that point of view there would be no more infection of the tin can odor than there would be in the starter can.

Mr. Moore: These starters, of which Mr. Meyer has spoken, are sent to the consumer every week. Now, isn't it a fact that sometimes when the second installment of the starter comes, the starter on hand is apparently in as good, if not better condition than when it was first used. In that case, would you advocate throwing away that fine starter and using the new one? Or, would you put that bottle of culture into the startoline, using the new altogether?

Mr. Meyer: If I understand your question, it is after you get the pure culture whether you use the first coagulation.

Mr. Moore: No, after you have a starter from the first bottle that has run along for several days, should you use that; in other words is it wise to keep a starter longer than a week? By that time the manufacturer sends along another bottle. Will you use that to make an entirely new starter, or will you keep on with the other if it is in good condition?

Mr. Meyer: If my startoline was in good condition, I would keep using it, even though a fresh sample were sent to me, I would use the new perhaps to start to grow the next sample, because my own might get too old.

Mr. Noyes: How long would you carry your startoline if it kept in good condntion, and use it right along?

Mr. Meyer: This would entirely depend upon the skill of the person handling it. One man may carry it for a month and another may only be able to carry it a week. I have known of men who were able to carry it for three months in general factory practice, but as soon as I would discover off flavors I would drop the poor culture and grow a new one.

Mr. Noyes: Some say they carry them a year and I think we have one record of carrying them even five years.

Mr. Meyer: I doubt whether that can be done in the average factory.

Mr. McCready: I understand Mr. Robert Johnston carried one for nearly two years. I would like to hear from him.

Mr. Johnston: I did carry a starter for five years and I think some of that starter is in use at the present time, and that was three years ago. We do not use commercial starters with us at all, we have not had good results from them. If we want to change a starter, they grow them in the Agricultural College over there under the direction of Prof. Harris, and anybody can get a starter there, but it is absolutely true that the starter that I started with has been in use now for eight years. They call it the Johnston starter, and you can get it all over our section of Cananda and it is in nice condition today.

The Chairman: Mr. Meyer what would be the result of a starter having one per cent of acidity in it? Would it be as noticeable as a starter having .8 of one per cent?

Mr. Meyer: I don't think there would be very much difference in propagating a startoline for about a week or so whether we had .8 of one per cent or one per cent of acid. Of course there is great danger of spoiling at that high stage of acidity, it seems that the germs have lost their vigor.

Mr. Johnston: I found in our experiments in regard to the starter that if there is anything over .8 of one per cent of acidity it is not as active, and even below that, .8 is the limit and as the acidometer is used in every one of our factories they can control that.

The Chairman: At what stage of acidity does this milk coagulate?

Mr. Johnston: I couldn't tell you that. I am not actively engaged in the cheese making business, it would coagulate, I would suppose, at .5 of one per cent.

The Chairman: Do they add water to their milk?

Mr. Johnston: In some cases.

Mr. Michels: I would like to ask Mr. Johnston his method of propagating.

Mr. Johnston: I can only say I took particular care, nobody touched my starter but myself. We carried all through the summer. I kept my cans and utensils in good shape all the time and kept them covered. We do not make cheese on Sunday and carrying it from Saturday to Monday morning, used to be our greatest trouble, but with the cheese iron, which we always put in, we are able to overcome that trouble and not have our starter with too large a percentage of acid. Of course I pasteurize everything in connection with my starter. My dipper was put in scalding water before I used it in my milk at all. We have to stir; while we have a few such cans as were spoken of here, they are in the creameries, none in the cheese factories. We generally use a can that will hold forty or fifty pounds of milk. We have a tank with a cover on it, but we do not carry the starter ever at a temperature of over 70 after it is pasteurized, it never gets any higher, and we have had very good results. We find in our country that the best cheese is made where a man looks after that business himself. I think I was the second man in Canada that used a starter and the way I started to use it was an accident. We took the milk, let it sour and then carried it on. The trouble was it would go off every three or four days and we had to throw it out. When I started in the butter business, we used to use buttermilk to start with, but when I got a starter it was propagated at Guelph at the Agricultural College, and we never had to use any more than twenty to forty pounds on 6,000 pounds of milk. The trouble in those early days was that they used to dump in a can of starter, thirty, forty, a hundred pounds sometimes for the simple reason that they thought they could hurry the finishing up of the making, and in my experience a large percentage of starter does just the opposite thing.

Mr. Moore: Is it a fact that the amount of acidity after the point of coagulation is always the same, does not vary?

Mr. Meyer: The acidity at the point of coagulation may vary considerably. Sometimes we find the starter coagulated when it had .45 per cent and sometimes it had .6 at the point of coagulating. There are two conditions which influence this, first, a condition where the starter is grown at a little too low a temperature at the end of the souring; or where the acidity

is developed merely to the extent, say, of about .6 per cent at a low temperature. The starter would not coagulate unless it is warmed to about .65.

A TALK WITH THE BOYS.

J. H. Monrad, New York City.

Editorial Staff New York Produce Review and American Creamery.

Mr. President and Fellow Members: I have criticised the secretary for overloading his program and feel it my duty to cut my talk very short.

I have but two subjects in which I desire to arouse your interest, one is the co-operative cow test association, and the other the milk scoring problem. You, as cheesemakers, are vitally interested in both, the one is to secure more and richer milk and incidentally more satisfied patrons, and the other is to secure better millk and hence not only better cheese but *more* cheese. The first subject I cannot try to discuss at length, it would take the whole day but I have culled a few facts from some of the Danish Tests Associations. It is years ago when I first announced the first year's work of the first association 1896, when it was shown that in thirteen herds aggregating three hundred cows the cost of producing a pound of butter varied from fifteen cents to seventy-eight cents. This startling result produced a sensation and Denmark now counts four hundred associations, Sweden two hundred and seventy-three, Norway one hundred and sixty-three, and Germany sixty-seven.

Soon combinations were made by the various associations for uniformity of reports and general education. On the Island of Zeeland 54 associations out of 65 had joined the Zeeland combination of test associations in 1902 and the average yield per cow in 45 herds varied from 5175 pounds of milk to 7151 pounds, and from 195 pounds of butter to 273 pounds with a general average for all the cows of 6169 pounds of milk

and 235 pounds of butter. This represents, after three years of testing, an increase in the average yield per cow of 490 pounds of milk and 23 pounds of butter. At the same time, however, the yield per 100 fodder units had been decreased from 143 pounds to 137 pounds of milk and from 5.34 pounds of butter to 5.23 pounds. This is not as it should be. In most cases we find an increase instead of a decrease.

The above report comprises cows and heifers—all, but if only the older cows (five years or more) are considered, we get an average of 41 herds to be 6265 pounds of milk and 233 pounds of butter, whereas the third year shows an average of 6711 pounds of milk and 254 pounds of butter.

Of the cows three averaged from three to four thousand pounds of milk, 42 from four to five thousand pounds, 217 from five to six thousand pounds, 423 from six to seven thousand pounds, 180 from seven to eight thousand pounds, 37 from eight thousand to nine thousand, and 7 from nine to ten thousand pounds of milk.

Again as to butter one year under 150 pounds, 11 from 150 to 175, 62 from 175 to 200, 168 from 200 to 225, 260 from 225 to 250, 218 from 250 to 275, 124 from 275 to 300, 40 from 300 to 325, 16 from 325 to 350, 6 from 350 to 375, and 3 from 375 to 400.

In the Kolding combination of twenty test associations with 6963 cows, we find the average pield per cow for 1904 to vary in the herds from 5433 pounds of milk to 6719 pounds, and from 201 pounds of butter to 262 pounds, with a grand average for all the cows of 6229 pounds of milk and 2353 pounds of butter. This is an increase of 476 pounds of milk and 19 pounds of butter in the first year, of 1901. In this association I find an increase of from 133 pounds of milk to 137 pounds per 100 fodder units and in the butter from 5.01 pounds to 5.09, not very much but yet an increase.

But great as the combinations are for the combinations, we find still greater variations in the herds; thus in Gording association with 29 herds and 305 cows, the average yield per cow in the herds vary from 3526 pounds of milk and 135 pounds of butter up to 7120 pounds of milk and 276 pounds of butter, with an average for all the herds of 5630 pounds of milk and 208 pounds of butter. The former used 3799 fodder units per cow, the latter 4549, but that the heavier feeding paid is shown by the fact that while the former produced 93

pounds of milk or 3.8 pounds of butter per 100 fodder units, the latter produced 150 pounds of milk or 5.85 pounds of butter. The average yield per fodder units was for all the herds 130 pounds of milk and 4.82 pounds of butter.

But enough of this, your own Hoard's Dairyman has for years hammered at this subject and it is time that you cheesemakers get to work and create an enthusiasm among your patrons for testing the individual powers which can best be done through co-operation.

This scoring of milk should be inaugurated at every cheese factory with or without premiums but it should always be surprise scorings and they should always be posted at the weigh can—they should include a careful Wisconsin curd test and 50 points be given for that while the other 50 should be on what the receiver is able to judge of at the weigh can including condition of can and cleanliness of wagon.

This means extra work but not half the work you now have to expend on making a commercial cheese out of poor milk.

DISCUSSION.

Mr. Michels: I would like to ask Mr. Monrad a question. I have been carrying on cow tests for a number of years and I carry them on free of charge and do the testing. All the patrons do is to raise the milk and bring it to the factory. I do the testing and the figuring. Now, it is getting so I cannot handle it, there are too many of them, and I ask you what is the next best step for me to take.

Mr. Monrad: You have got to hire a man and, by the way, that would help out our dairy school graduates and our short course men and build up a new field of work. Hire a young man for that work as they do in Denmark and Germany. You can hardly afford to drop it. Of course I know it is easy enough for me to talk to you about getting up these associations and I know that half your patrons are thinking there is nothing in it, but, gentlemen, if you are not going to be the leaders, how are we ever going to get improvement? You have got to shine as lights at your factories, not only by your own personal cleanliness and atmosphere in every way that the patrons

will look up to, but you must be in their confidence and hold it. I know it is hard work, but I hope you will tackle this subject and get your patrons interested so that they will chip in and hire a young man to do the work and you might, Mr. Michels, for instance, might very well chip in $100 to that cause, because I believe it will result in your getting better milk. You see if you just take their samples they do not get the effect of that experience, a man calling at the station incidentally doesn'a know so much about it. I also believe that the state should do something in this matter. I forget now the exact amount, but I think that little Denmark gives something like twenty-two thousand pounds to keep up such associations a year, but they only give it to those patrons who will help themselves. You have every chance to educate your patrons, tell them to take Hoard's Dairyman and see how one cow returns $15 for her feed and another $75.

Prof. Emery: What about these cow tests in communities where the factories themselves buy their milk by the hundred and make no difference whatever in the quality of the milk?

Mr. Monrad: Well, you strike the happy medium. They made that mistake in some of the districts in Sweden, they do not pay by the test in many factories; but, unless you do, the patrons won't care for the richness of the milk.

Prof. Emery: The point is to start the reform at the factory and see to it that the factory begins paying by the test for the milk.

Mr. Monrad: I understand that in Wisconsin the majority of them do.

The Chairman: The sweet curd factories do not. The majority of those that make American cheese do pay by the test.

Prof. Emery: I have read reports from about 1800 cheese factories, and my observation is that there are a very large number buy milk by the hundred weight.

Mr. Noyes: Some of the factories' patrons will not furnish milk paid for by the test.

The Chairman: Mr. Michels, how long have you been carrying on this test for the farmers?

Mr. Michels: Two years.

The Chairman: Are there any of those who were there when you began that ceased to be interested on account of the test?

Mr. Michels: You can't shake them any more. There are more added every year.

Prof. Emery: Suppose that in this matter of scoring the milk at the factory, you put up the figures where every patron can see them, how would that work?

Mr. Monrad: A very good plan. Of course those written records would stay up quite a while and at lots of factories they do not come there very often, but when they did come in addition to seeing the figures, they could see and smell the milk, too.

A Member: I have tried that this summer, and also put down the curd test, and it has helped. In making the cow test, I take a small test and I go to their barns at night when they are milking to do it. I have done it for three years and have not got around yet. I test the cows as they are milked, taking a sample of the milk. It doesn't take very long and I have noted improvement.

Mr. Monrad: That is a very good plan as a starter, but I confess to a supreme contempt for these short records. When our breeders of pure bred cattle brag about how much a cow did in one week or one month, I don't take any stock in that, I want to know what the whole herd did and has done for a year. That is what I am trying to get at.

The Chairman: In order to get this record and have a record that is practically correct, how often have you got to test the milk?

Mr. Monrad: Well, that varies. There are a few of the associations that test only once a month, but most of them test every two weeks. Of course that is a matter that could be arranged. I would really prefer a two or three days' test running or even a week's test, then test again after three months, providing I kept good track of the milk and then again I want my visits to be a surprise to the farmer, because farmers are like cheesemakers, they want to get a big record and if you let them take the samples for testing there is a little danger. The only way to be sure is to have a disinterested person take the sample.

The Chairman: If they are taking their milk to the creamery it can be very easily verified from the creamery returns, whether they are helping out their product.

Mr. Michels: The creamery or cheese factory will show just how many dollars and cents they received for that milk

which is to be distributed among the number of cows that they own. The only thing they could do would be to take it from one cow and give it to another.

Mr. Monrad: And they might claim they used so much for the calves and for the household. They can pad it out.

Mr. Michels: The way I have been doing is to take three days in the month, the 10th and the 20th and the last of the month, take samples mornings and evenings and weigh it; also take samples of the same milking and put it in a composite test jar, and then we have our composite test. I have found some bad mistakes, but I find the most of them are very close. One man, with seventeen cows, came within $2.63 of the total amount of money received at the factory; that is on the whole year's record, for twelve months.

Prof. Farrington: The subject of testing cows and the cleanliness of milk is something that you can talk about for a good many hours, and I do not propose to talk about either subject, but just one thing has occurred to me recently that I think may be useful to the patrons of creameries and cheese factories. You know the powers of persuasion are often exhausted in trying to induce the patrons to take better care of their milk. At the present time, we have laws in this state in regard to the sanitary condition of milk and of the milk cans in which the milk is brought to the factories. Nearly every factory sends a statement to the patrons along with their checks every month and you could on that statement give certain figures in regard to the amount of milk brought and its test and the amount of money paid and have these printed. It has occurred to me it would be very helpful in the way of improving the quality of your milk if you will copy on this same statement that you send out every month, a statement in regard to the amount of milk, these two paragraphs of these laws concerning unclean and unsanitary milk and milk cans. It is only about a hundred words in the two paragraphs; one is in regard to the cleanliness of the milk and the other in regard to the cleanliness of the can. Copy those two paragraphs of the State Law on your statement so that every time that statement goes to the patrons, they will see what the State Law is in regard to cleanliness of the milk and of the cans. I don't see why that should not be a help along these lines.

Adjourned until 9 o'clock a. m., next day.

MORNING SESSION.

The convention met at 9 o'clock Thursday morning, January 4, 1906.

The president in the chair.

WHEY BUTTER MAKING AT WISCONSIN SWISS CHEESE FACTORIES.

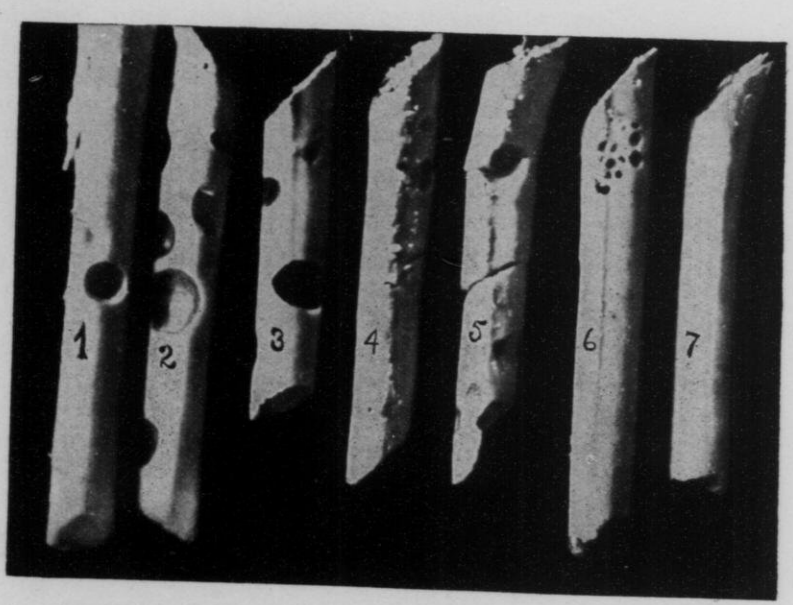
PROF. E. H. FARRINGTON,

In Charge Wisconsin Dairy School.

During the past summer I have spent several weeks among the Swiss cheese factories in the southern part of Wisconsin. In these visits I learned something about the making of Swiss cheese and also about the relation existing between the Swiss cheesemaker and his patrons, as well as about the long days and the hard work with which every Swiss cheesemaker is familiar.

My principal object in making these visits was to study the question of whey butter making. I was informed by Mr. Fred Marty, who has traveled extensively through the Swiss cheese section of the state, that there were about ten Swiss factories in which centrifugal separators are used for skimming the whey for butter making. These are the results of our work at the Dairy School where we have been giving instruction for several years in whey butter making and the use of a separator for skimming whey.

The great majority of the factories I find separate the cream from the whey by either the cold process or the hot process, and I visited factories where both these processes were used as well as a few in which separators have been placed. I stayed at the factories several days and followed through the entire process of skimming, cream ripening, churning, and butter making, as carried on by the Swiss cheesemakers.



A series of plugs from Swiss cheeses of different quality, Nos. 1, 2, 3 would be classed as No. 1 cheese, though No. 2 has rather too many holes. Nos. 4 and 5 show the cracks of a glassier and the corresponding pasty appearance. No 6 at the upper end indicates a nessler, though a typical nessler would have the small holes the entire length of the plug. No. 7 is what would be termed a blind cheese as there are no "eyes" or holes.

THE COLD PROCESS OF SKIMMING.

When whey is skimmed by the cold process the butter is almost invariably strong and sells for about the price of lard or less. It cannot often be used for table butter but there is some demand for it by bakers and confectioners. As a rule the cheesmaker himself will not use the cold process butter on his own table. When he wants butter he separates some cream by the hot process and churns it, making a decidedly better quality of butter than is possible by the cold process.

It is hardly worth while for me to go into the details of the two processes of separating the cream, but I can say in general that in the cold process the whey as it comes from the Swiss kettle is run into wooden tanks placed at one side of the cheese factory under a loose board roof; the whey is allowed to stand in these tanks for about twenty-four hours and the cream which rises is skimmed off and placed in wooden wash tubs in the cheese curing cellar, where it is kept until a sufficient quantity of cream has accumulated to make a churning. Those who are familiar with butter making will understand from this description that the whey as it stands in the tank at one side of the factory in warm weather soon sours, and that the cream which rises is overripe when skimmed. This, together with the odors which the cream absorbs while waiting in the cheese cellar for a sufficient quantity to make a churning, gives the cream and the butter made from it a decidedly strong and rancid flavor.

THE HOT PROCESS OF CREAM SEPARATION.

When the cream is skimmed by the hot process the whey in the kettle is heated to a temperature of about 175 for some time, the whey being constantly stirred during the heating process. The fat rises to the surface of the whey and is then skimmed off with a wooden scoop and placed in tubs to cool and settle. Considerable whey separates from the cream and this is usually drained off through a hole near the bottom of the tub.

In the hot process of skimming the cream is thoroughly pasteurized by the continuous heating it receives and therefore it does not sour so quickly as the cold process cream. The butter made from the hot process is, therefore, considerably

sweeter than that from the cold process cream, and on this account a better price can usually be obtained for it.

From the observaions made at factories where the cold and the hot processes were in use, it was found that by the cold process the skimming was inefficient—about one-third of the fat in the whey was not separated. The hot process skimming was more efficient, the skimmed whey testing in some cases as low as one-tenth of one per cent fat.

CONDITION OF THE WHEY.

The whey from the cold process of skimming was very sour, having in some cases as high as seven-tenths per cent acidity. This sour whey when returned to the farmers in the whole milk cans of the patrons, will, of course, contaminate them. It has been found that defects in the cheese may easily be caused by this transfer of sour whey from the factory to the farm in the whole milk cans.

The whey from the hot process is sweet when taken from the kettle and it could undoubtedly be returned to the farms in good condition if the whey barrels were kept clean.

THE CHEESEMAKERS' METHOD OF RIPENING THE CREAM.

As a rule the cheesemakers' method of ripening the cream and working the butter is unsatisfactory. A wooden tub is not a good cream-ripening vat, and a cheese curing cellar is not a satisfactory place for holding cream while it is being ripened. The wooden tub absorbs strong odors which cannot be removed by washing it. neither can the cream be warmed or cooled very easily in it. These are two serious objections to the use of a tub as a cream vat.

The cheese curing cellar generally has an atmosphere that is not desirable to have in butter and when cream stands in such a place for the purpose of ripening, the cellar odors are often absorbed by the cream and transferred to the butter.

One of the things which the cheesemaker needs very much is a cream ripening vat of some sort. It need not be an expensive one, but the double walled vats used in farm dairies, or a cream vat built like the creamery starter can, will make a very satisfactory piece of apparatus for ripening the cream at a Swiss cheese factory.

The cream must be protected from outside odors and cooled or warmed as desired by changing the temperature of the water surrounding the cream. A covered milk can set in a tub of water is better than a wash tub as the water in the tub surrounding the can may be changed and the cream cooled by stirring it.

THE USE OF A SEPARATOR FOR SKIMMING THE WHEY.

I visited three factories where separators were used for skimming the whey immediately after the curd was taken from the kettles. In every case the skimming was efficiently done, only a trace of fat being left in the skimmed whey. The cream from the whey in some cases was thin, testing only about twelve per cent fat, but this cream when skimmed a second time gave a cream containing thirty to forty per cent fat.

The separator cream from the sweet whey was certainly of as good quality as a creamery buttermaker could ask for. I am sure it was sweeter than the cream obtained at many creameries from whole milk, and that many creamery buttermakers would consider themselves fortunate if they could obtain a cream so sweet as that skimmed by the separator from sweet whey.

DISPOSING OF THE SEPARATOR WHEY.

The whey as it comes from the separator is perfectly sweet, and at one factory it was pumped into a whey tank similar to the creamery skim milk tank, from which the farmers filled their cans by means of a hose. I tested this whey as the farmers were drawing it into their cans and found that it contained less than two-tenths per cent acidity. Such as this will certainly not contaminate the patrons' cans as it may be returned to the farmers in a perfectly sweet condition

A whey storage tank should be provided at Swiss cheese factories and this whey tank should be cleaned carefully each day in the same way that creamery buttermakers clean their skim milk tanks. The sweetness of the skim milk delivered to patrons at creameries depends in a large measure on the care with the skim milk pipes are cleaned daily. The same attention should be given to the skimmed whey, but since the milk received at the Swiss cheese factories is generally sweeter than

that received at a creamery, the separated whey will undoubtedly be sweeter than the skim milk. The separator, therefore, at a Swiss cheese factory makes it possible to deliver to the patrons a perfectly sweet whey.

The cream skimmed by the separator from the whey is sweet and in excellent condition for ripening. It will be necessary, however, to use a starter and some sort of a cream ripening vat as mentioned before, in order to handle the cream properly.

THE SWISS CHEESEMAKERS' CHURN.

The churns ordinarily used at a Swiss cheese factory are wooden barrel churns. They are often saturated with a sour whey odor and when churnings are made in them the butter absorbs the odor and this spoils it for use as table butter. It is, therefore, desirable when a separator is placed in a Swiss cheese factory to inspect the churn and see that it is clean and wholesome with no "cheesy" odor about it. A small combined churn and worker would undoubtedly be a valuable piece of machinery for a Swiss cheese factory to use in making whey butter. It will obviate the necessity of taking the butter from the churn and working it on a table worker or board where it may be injured in warm weather.

The details of salting and working the butter are things a Swiss cheesemaker needs to learn more about than he knows at the present time. He can easily do this, however, if he is provided with proper utensils.

COMPOSITION OF THE WHEY BUTTER.

I took several samples of whey butter at different factories and I found that the butter made by the cold and the hot processes of separating the cream, and by the primitive methods of cream ripening and churning, contained an excessive amount of water and rather a large percentage of curd. The butter, however, which was made by skimming the whey with a centrifugal separator and then ripening the cream in a milk can which was placed in a tub of cold water so that it could be cooled immediately after separating, had a composition corresponding to that of ordinary creamery butter. The quality of this butter showed conclusively that good butter can be made from whey at Swiss cheese factories by skimming the whey

with a separator and then ripening and churning the cream by modern methods.

LOSSES AT SOME FACTORIES.

At one factory I visited there was received from ten to twelve thousand pounds of milk daily. At least ten thousand pounds of whey was obtained from this milk and as my tests at several factories showed that the whey often contained as much as one per cent butter fat, this factory must have left at least one hundred pounds of butter fat in the whey daily. At the time of my visit the cheesemaker was making twenty-five pounds of butter per day by the cold process and selling it for about eleven cents per pound. At least seventy-five pounds of butter fat were being returned to the farmers in the whey and while this undoubtedly is good stock food, it is an expensive one. If this seventy-five pounds of butter fat was made into butter and sold for only fifteen cents a pound, it would amount to $11.25 per day, which is certainly more than the farmer gets for the butter fat by feeding it to his pigs and calves.

This example may be an exaggerated one as very few Swiss cheese factories receive so much milk as this per day; but many of them are receiving five thousand pounds of milk per day and losing proportionately in the whey as shown by the calculations at this factory.

A WHEY BUTTER CHURNING STATION.

It has been suggested that a profitable business could be done if a churning station was built in a neighborhood where there was a considerable number of Swiss cheese factories, the cheesemaker at each factory skimming the whey with a separator, then pumping the whey into a clean storage tank, and the parties running the churning station gathered the cream each day from a number of cheese factories. This churning of the cream at one central place which is well equipped for the purpose would give a better quality of butter than that made at each of the factories and would also relieve the cheesemakers of the butter making. I am inclined to think that this proposition could be worked out advantageously to all parties interested. At the present time the whey butter made at Wisconsin Swiss cheese factories is not a first class article of table butter; it sells

for about the price of lard and only about one-half the butter fat in the whey is recovered. The old methods that are responsible for these losses should be changed as the use of a separator for skimming the sweet whey, and modern appliances for ripening the cream and making the butter will easily double the amount that has been received for whey butter in the past.

DISCUSSION.

Mr. Marty: What per cent of water do you find under the old process of making whey butter?

Prof. Farrington: As a rule such whey butter contained over sixteen per cent of water. This separation butter that we made contained less than sixteen per cent, every sample that we made. Its quality was good, although it had continued heating in the Swiss cheese process. I knew of one case where they were selling this whey butter for 19 cents, when the Elgin market was either 19 or 20. That is a demonstration of the fact good butter could be made from whey. At that time the old process whey butter was bringing from nine to eleven cents, usually about the price of lard, and it is used for about the same purposes that lard is used, except that confectioners use it. We did not have any of this butter scored. We sent it to some commission men. I asked the owners of the factories to get some scored, but they never reported to me any scoring. I did the best I could to score it myself and I know from the price received for the butter that it must have been a good quality.

Mr. Marty: Isn't it a fact, Professor, that there is a little more difficulty in obtaining the same results in the manufacture of whey butter than in the whole milk system? I think we need a higher per cent of acid on our cream. Also, as to the grain of the butter I think there is a marked difference in the two.

Prof. Farrington: I have mentioned that difference in the texture, the body of the butter. It cannot help being quite different in texture on account of the long heating that the milk gets in the Swiss cheese making process, and the cream must be handled somewhat differently than the cream from whole milk, both in the ripening of the cream and in the cool-

ing of the cream. It will be somewhat difficult to overcome this softer, mealy texture, but at any rate the product will be greatly improved in quality over the old process product. I do not see why you cannot improve the texture of this whey butter in the same way they improve the texture of process butter, which, as you know, is quite different from that of whole milk butter.

Mr. Marty: I have found that by making it a little higher acid, say .6 of one per cent or .65, as we usually have it at the dairy school, it works better, and also in working the butter you have got to be very careful not to overwork it.

Prof. Farrington: That is one of the details that the man who has the churning station could work out, and although I would not advise that as the best thing to be done in regard to making whey butter, it strikes me it is worth thinking about and if the man devotes his whole attention to making whey butter at this churning station from a lot of cream from a lot of factories, he can overcome these defects and make a much better grade of butter in the state of Wisconsin than can a cheesemaker who is trying to make his own butter.

Mr. Marty: The old method, the hot process which used to be applied to the manufacture of Swiss cheese I would be much more in favor of today than the use of the separator, but that process has been done away with, simply for the purpose of saving labor. As the professor has said, we used to work in these factories from twelve to eighteen and twenty hours a day and when the hot process was applied to the manufacture of whey butter morning and night, it kept a man around till half after one in the morning, and that was why the cold process was adopted as a means of saving labor, but as the professor says, that is liable to get us into the more difficult problem connected with the delivery of this unsanitary whey back to the farm. I know of instances where whey has remained at the building thirty-six hours before it is returned to the patrons. If we can find ways and means to get a separator I think it would be a step forward and help solve that problem which is important.

Prof. Farrington: Did I understand you to say that the butter from the hot process whey cream was better than that from the separator whey cream?

Mr. Marty: I mean to say this, that by using the hot process method, it is like pasteurizing your whey before it is delivered to the patron, which should be adopted throughout the

state of Wisconsin, both by the cheddar cheesemakers and the foreign cheesemakers, because in that way the temperature is brought up to about 180 Fahr., and that is beyond the necessary heat for sterilizing that whey, and I think much better than even the separator as to sanitary conditions, and the butter was a very good quality from the hot process, and the yield I have found practically the same as by the use of separator.

The Chairman: How about the flavor, Mr. Marty?

Mr. Marty: The flavor is perhaps not as good as by using the separator, but the flavor of the separator-made butter is not as clean and not as good, I find, unless you have some sort of a commercial starter or skim milk starter and add a large per cent of it to the cream during the ripening process. Thereby you incorporate that peculiar flavor of whole milk butter.

Mr. Noyes: Isn't that desirable? Doesn't it pay if you can make the finer butter by using the separator and sterilize your whey afterwards?

Mr. Marty: That would mean extra labor again. Your whey would have to go back into your kettle.

Mr. Noyes: Oh, no, you can do it in your vats.

Mr. Marty: What if you have an open fireplace? Then you will need an extra boiler for sterilizing your whey.

Prof. Farrington: Even in this separating of the whey by the separator, you have to a certain extent pasteurized the whey in the cheese making process. You have heated it up to 125 or 130 and you thereby get some of the benefits of the high heat, even if you use the separator.

The Chairman: At what temperature does whey separate the solids from the watery portion?

Mr. Marty: In what process do you mean?

The Chairman: No process at all, just heating the whey?

Mr. Marty: Why, you can heat your whey to 212, and there will be no separation of butter fat.

The Chairman: I don't mean butter fat, I mean the solids, whatever solids are there, there are albumenoids, sugar, a kind of a scummy substance comes to the top.

Mr. Marty: You can boil whey to 212 and you will not have any separation of butter fat unless you add a lactic ferment, which we add at a temperature of 62 Reaumur.

Mr. Noyes: At 212 Fahr., you will have just a clear watery substance.

Mr. Marty: It has no influence on the butter fat.

The Chairman: No, I wasn't talking about butter fat. It will set free the albumen and the sugar.

CHEAP FEEDS FOR MILK PRODUCTION.

GEO. MCKERROW, Madison, Wis.

Supt. Department of Farmers' Institutes.

Mr. president, ladies and gentlemen, members of the Cheese Makers' Association—Some thirteen or fourteen years ago, I think it was, the farmers' institutes of Wisconsin began to carry about with them that then new invention, the Babcock milk test, with the object of acquainting the farmers of the state and even some of its cheesemakers and buttermakers at that time with the workings of the Babcock test.

At Plymouth, Sheboygan county, in the center of the old dairy district in Wisconsin, with a very large audience in attendance, we were operating the Babcock test. Mr. Goodrich, of Fort Atkinson, was explaining its workings and its advantages to the farmer and the factoryman in making both the farmer and the cows honest. Some of the farmers in that meeting and some of the cheesemakers were opposing the introduction of this test into the factories, and we were having a pretty good "set-to," when I noticed—at that time I was presiding over the meeting—way back in the audience a lean, slender sapling of a youngster without any beard, arose, and the thought flashed through my mind, what does this youth know about the Babcock milk test? But I thought I would allow him to ask his question, but instead of asking a question he entered into the discussion, and made his point very clear before he got through, and I wondered who that fellow was and where he got his information in his short life.

That man has developed into considerable of a fellow since that time, so much so that we have used him in the Farmers' Institutes of the state and you have elected him your president. But that is not my subject.

I am to talk about cheap feeds for milk production, I be-

lieve. Now, I understand I am talking to an audience of cheesemakers. You look a little slicker than the average farmers' audience but I don't know that you are any wiser in a general way.

I am in the habit of talking to the farmer, and I may say a good many things that do not apply to you fellows here, but when I was asked to attend this meeting and address you and to choose my own subject, I knew that I couldn't tell you how to make brick cheese or cheddars or even whey butter, but I could discuss with you some of the problems that you, as well as the farmers, are interested in. To some of you they may appear out of place, but you will agree with me that we are living in an age of education and that every man ought to do his part in the educational work; that you as cheesemakers come in contact with the farmers of your district and it is not only your duty, but a part of your business, to discuss any questions that relate to your business, as intelligently as you can, with these farmers. If you cheesemakers have clean cut ideas about how to produce cheap milk and good milk and can give the farmers the benefit of those ideas so that their milk may be produced a little cheaper in your neighborhood and brought to your factory in a little better condition then you are helping yourself as a business proposition. For that reason I suggested that I might talk on a subject like this.

CHEAP FEEDS FOR MILK PRODUCTION.

Now, we sometimes, even the best of us, get wrong ideas about things, and at the outset I don't want any of you to get the idea that this word "cheap" used in this connection, means low-priced feeds. Sometimes the concentrated foods that you can buy at $12 or $15 a ton are much dearer than other concentrated foods at $25 a ton. The farmer ought to know the difference between the value of these food stuffs, the real producing value. If there are any farmers in the room, you know you can buy a cow for $25 that will be a much dearer cow to you than another one bought at the same time for $50.

Now, my idea of cheap is based upon this, not the food that costs the least per ton, but the food that costs the least for what it will give you, what it will do. With that idea in your minds, I think we can proceed to discuss the question of cheap feeds for milk production, and you as cheesemakers are interested in

this question, because the cheaper your patrons can produce the milk delivered at your factory, the more profit there is for them. That means that they will, if they are going to make an increased profit, they will increase their milk production and that will increase the output of your factory and cheapen your goods and give you a better field to work in.

Now, the farmer, of course, should not only have knowledge of how to get the cheapest feed to produce his milk, whether he raises it or buys it, but he should also have some knowledge how to combine the different food stuffs so as to keep his animal up and get the best production from her without injuring her.

We Wisconsin people are very proud of the record of some of our Wisconsin cows; we have produced in public tests some of the best cows in the world, so far as records go. When we look into the matter, we see that these cows have been handled and fed while they have been making these records and that a great deal of intelligence has been exercised in the feeding of these particular animals and if it had not been the record would not be here to show it. So with your farmer patrons, the more intelligence you can get into them in handling these feeds, in combinations, as they feed them to their cows, in the amount each cow can take the better for their business, and that means the better for yours.

Now, I think we may lay it down as a fair proposition as a rule that the cheapest feeds for the milk producer are the feeds produced upon his own farm—as a rule, I say—and yet people can often buy feeds and make large profits by doing so, so that I do not mean to say they ought not to buy, but it is always best for the milk producer to grow all he can of the cheapest kind on his farm. When we stop to think about that and about the different feeds in Southern Wisconsin, we immediately think of the corn plant, and it does produce a very cheap feed, but you know a farmer who attempts to produce milk with all corn makes a failure of it. He should produce as much corn as he can use in his feeding operation, and keep that in as good form as possible so that it will be eaten by his cows readily and digested easily. The form which is best is probably in the form of ensilage. Silos are scattered all over Wisconsin, nearly every first class dairyman has a silo, or he is thinking about having one, expects to have it. I see in this room before me some farmers who had some of the first silos in the state of Wisconsin, and their experience along that line is

better than mine, though I have had a silo for a good many years, and I know that good silage—and that is the only kind that is cheap—is a good thing for the cow. I have seen ensilage that was gotten in the silo at a very low price per ton, and it was very poor ensilage, and it was very dear ensilage because it ruined the digestion of the animals it was fed to. It proved to be the dearest kind of feed, although it cost but little per ton. The kind of silage I am speaking about is made of good, matured, well-filled corn; such silage contains a great deal of substance, and is good feed. It should be put into the silo mature so that it will not show later on too much acidity,—it will be sweet ensilage,—then your animals can eat that ensilage when fed in the right proportions with other feed and get the most out of it and that is the cheapest kind of ensilage, although it costs much more to put into the silo than another lot, which will turn out to be poor, sour, watery ensilage; the good ensilage might cost $2.50 or $2.75 a ton to put up, but it would be cheaper than that which only cost you $1.60 a ton. I knew of a man who ruined his whole herd of cows, feeding them poor ensilage and too much of it. His ensilage did not bring back the $2.00 a ton which it cost to put in, but on the contrary, it brought back a damage of $5.00 a ton.

Nearly all you chessemakers have some ideas about ensilage, I presume, because silos are so plenty in Wisconsin. We have made it our business to talk silos all over the state for fifteen or twenty years. At first we did some ridiculous talking, but we have added to our information, and we know it is a good thing now.

The clover plant flourishes well in Wisconsin and has helped and will help to make Wisconsin the greatest dairy state in the Union, and one of the greatest dairy spots in the world. You all know something about the clover plant and yet lots of our farmers who know considerable about it do not handle it right. They do not grow it right and they do not feed it right. There is a great difference between one ton of clover hay and another ton of clover hay. I do not think there is quite as much difference as there is between the different qualities of ensilage, but still there is considerable difference. Another point in clover hay as compared with ensilage, the farmer cannot control the conditions of making clover hay quite as well as he can for making ensilage. There is no excuse for the farmer making poor ensilage, but there is some excuse for his making poor

clover hay, because the Lord interferes, but the man who thinks about it and has his plans well laid and has his hay caps in the shed ready to put on, can make and does make much better clover hay than the fellow who says, "Let her go."

It is your business to try to educate the farmers to make good clover hay.

We are growing a new plant in Wisconsin that is to my mind one of the cheapest food producers for the dairy cow or any other animal that we have ever had, and that is alfalfa. We find now that alfalfa is being grown nearly all over this state. I have grown it myself for a few years and I think that the land that I am growing it on is about the poorest in the state to grow alfalfa on, and yet it is as successful on my farm as clover or any other feeding crop, and it gives the best food product for our cows, or any of our other animals that we have ever grown in coarse food. Good alfalfa cut early enough when the first blossoms are appearing and then curing just as well as you can cure it, is better than the best clover hay; that is, I have seen alfalfa that I would just as soon take per ton of its feeding value as I would take some of the bran that we buy these days where we get all the mill sweepings in it. Of course, the alfalfa is a coarser product than the bran, and as a rule is not as valuable, ton for ton, but it is very valuable, and when the dairymen throughout the state are all growing alfalfa and you find that you can make milk considerably cheaper than you are producing it today, that is one side of the business that we are to look out for, the cheap production of a product. We want you cheesemakers to make a good product, to keep up the record of Wisconsin in the world's markets the record that we foolishly lost a few years ago in 1900. We have got it back, but I want to tell you in 1900 I spent a little time in the city of London, visiting butcher shops and groceries, where American products were being dispensed to the people, and I talked about the meats and I talked about butter and cheese with those people that they were supplying, their customers, and when I mentioned American cheese to the grocers there, they all turned up their noses and they looked at me as much as to say, "If you are one of those Wisconsin fellows, you better get out of here." They said further, "You fellows used to make good cheese in Wisconsin, but you have grown so smart you take out the butter fat and put in another fat and send your cheese over here and you have

killed the whole trade, and now we don't want to see a Wisconsin cheese."

You see honesty is the best policy. I was taught that when I was a little boy. I haven't always practiced it, but I have got back to it pretty well. We have got back our record pretty well for good cheese in Wisconsin and you want to stick right to it and make the best product possible with the cheap milks that your farmers who get cheap foods can produce. The farmer should be educated up to this point that he should be ready for any emergency. Some seasons clover kills out badly in different sections of the state, and some seasons that will happen to alfalfa, and then we are obliged to supplement this food with some other cheap food to get along with. Every dairyman in Wisconsin ought to have his ensilage, because that is something he is sure of. I have never seen the year when we could not raise a corn crop in Wisconsin, and I have lived fifty-three years in the state. You can raise it way up in Central Wisconsin and mature it enough to have first class ensilage. Then you have that cheap food to start with and your alfalfa and your clover come along to help you and the combination is a good thing. The combination of peas and oats will make a good feed. Let the farmer plow up immediately the field where the clover or alfalfa has failed, drill in his peas and sow his oats. I tell you a dairyman must be a thinking farmer; if he is not he isn't fit to be a dairyman, and he better go to raising sheep or hogs or something of that kind.

Now, as to purchasing feeds. The farmer who is short on concentrated foods—and most farmers will be short—will have to buy something. You have your ensilage with plenty of corn in; now, your thought should be, what protein foods in a concentrated form can you get that will be the cheapest and best for you? I think it is true that oil meal at $25 a ton is cheaper for him to feed with his ensilage, in a very limited quantity, of course, than bran at $16 or $17 a ton. The farmer should study that side of the question, just what is best for him to buy. It may be cheaper to pay $25 a ton for oil meal to balance up the other foods and to give tone to the health of your animals, which oil meal does to a greater extent even than bran. Then, oil meal digests well, helps the other food to digest better than any other food, unless it be blood meal, or something which is much more expensive. There is a lot for the farmer and the cheesemaker to think

about before he will fully understand the value of such foods as bran and oil meal, both good and yet under certain circumstances and conditions, where a farmer has a great deal of corn on his farm to feed, I believe the oil meal will be the cheaper to feed in limited quantities.

There is a lot to think about here, the man who has ensilage which he has grown on his farm and produced cheaply, makes a mistake if he does not buy such foods and feed them to his cows as will give them a balanced ration.

He makes another mistake if he does not give them variety. Every dairyman should understand that his cows like variety just as well as he does, and that variety should be of the right kind, of the kind that will help the cheap production.

Now, I have briefly outlined a few of my ideas along this line of cheap feeding for milk production.

DISCUSSION.

Mr. Marty: In the manufacture of foreign cheese we are much more dependent upon the different foods than you are perhaps in the manufacture of cheddar cheese and butter. The foreign cheese is known to everybody as sweet curd cheese, subject to gassy fermentation, and the condition of the milk is undoubtedly beyond the control of the best makers. We have to be careful in looking upon this question of feeding not to mislead our people. We can't use silage to any amount in the manufacture of Swiss cheese. Will alfalfa be helpful to us?

Mr. McKerrow: How is it with clover, has that a bad effect?

Mr. Marty: When it is in blossom, in its green form—that is only about two weeks in blossom. When it is cured, it has no bad effect.

Mr. McKerrow: I think you can safely say the same thing about alfalfa.

Mr. Steinhoff: What varieties of corn do you use for the silo?

Mr. McKerrow: Our farms are out here only twenty miles away on heavy clay, and the influence of the lake keeps it cold

in the spring. We grow early varieties of corn for our field and the silo, too; that we are pretty sure will mature. Of late years we are growing Flint corn.

Mr. Steinhoff: What do you mean by mature, past the glazing stage?

Mr. McKerrow: Yes, we cut at that stage for the silo. Many plant in drills, but much lighter than we do. We have a good crop of corn. Our corn the same as we put in the silo makes about 120 baskets to the acre.

Mr. Steinhoff: How much corn do you plant to the acre?

Mr. McKerrow: A bushel plants about six acres.

Mr. Steinhoff: Can't you get about twice as many bushels out of Dent corn?

Mr. McKerrow: We have grown early dents and they mature pretty well, but not as well, and they got caught by the frost more or less in the last few years. If we were further back from the lake, I certainly would grow dents.

Mr. Steinhoff: Do you consider that corn must be kept and put in the silo before the frost catches it?

Mr. McKerrow: No sir, I have seen very good ensilage made from corn that was frosted badly, but the sooner it can be got into the silo the better.

Prof. Emery: Have you seen poor ensilage made from such corn?

Mr. McKerrow: I have, where it was allowed to stand until it got too dry and no water put onto it.

Prof. Emery: In such cases do you tramp carefully?

Mr. McKerrow: Yes, we tramp thoroughly around the outside and we spread thoroughly. I think there is as much in that as in the tramping.

Prof. Emery: What size silo have you?

Mr. McKerrow: We have a stone silo about twenty-two feet square.

A Member: Would you advocate a round one?

Mr. McKerrow: I would, on general principles; although where we were building we could get the door into our silo better without affecting the other buildings close by. We have just one door, seven feet high, and that is the only break in the stone wall. The corner where that door is is left open. We put two stout planks in. Between where we fill that corner is the chute and the ladder goes up there. From the bottom of the silo up to this door, the corner is arranged so it matches the rest of it.

A Member: Did you ever put clover hay or alfalfa in a silo?

Mr. McKerrow: I never have. I have seen some very good clover ensilage come out of a silo, but in all cases where it was good there was corn above it, several feet that acted as a weight on it. Now, I see in this audience Mr. Steel, he has one of the oldest silos in the state and very likely he can give you better information than I can.

Mr. Steel: You are doing very well.

A Member: How do you sow peas and oats?

Mr. McKerrow: If it is a clover field killed out, we call it a clover sod, but it is not really a sod. We do not plow that very deep not to exceed four inches, then we harrow it thoroughly, and if it breaks up very fine we probably only run the smoothing harrow over it; then put in the peas, a bushel or a bushel and a half to the acre, and they should be drilled in probably three inches. Then we sow oats right across the other way, but sow them on the surface, sowing them right away, about a bushel and a half to two bushels, but after having had some considerable experience, we prefer to have a pretty good lot of peas and we are inclined to sow a bushel and a half of peas and a bushel and a peck of oats.

A Member: How about harvesting that crop?

Mr. McKerrow: We mow it, the same as any other hay.

A Member: You haven't told us how you cure your hay.

Mr. McKerrow: We sweat all our hay that is cut early enough. All these plants get too woody if they are allowed to stand too long and that makes their value less. We cut our hay when the dew is off and that applies to clover, alfalfa, peas and oats, all kinds. We cut in the forenoon and if it is very early in the season, while the hay is sappy, and the ground sappy, we usually have to run the tedder over, air it up and probably do not put that in the cocks until the next day; but if it is not too sappy we will cut it in the forenoon and get it in the cocks in the afternoon. Just as soon as it is partially wilted, turn the cocks over carefully. We have used hay caps and I like them, but we have so much of our hay that it is a big job to cap them, and we usually do not put the caps on, but it is put up in this green condition, and it will shed off almost all of the showers. We allow it to stand in those cocks, if it is dry weather, from two to three days. The cocks are about two or two and a half feet in diameter. Then we air out and

haul it to the barn just as quick as the surplus moisture that is sweated out of the clover or alfalfa has gone. You understand that by putting it up in this green condition, the leaves stay on it, and the leaves are lungs of the plant, and they throw out moisture.

A Member: Do the cattle eat the stems?

Mr. McKerrow: Yes.

The Chairman: I read a short time ago in Hoard's Dairyman where Mr. Hill, the president of the Dairymen's Association, recommended to farmers when they were sowing grass seed to add about two pounds of alfalfa seed to that grass seed for the purpose of getting the soil inoculated with alfalfa germs. I would like to have you explain the purpose of that.

Mr. McKerrow: Alfalfa does not seem to grow well on some of our farms, you dig up the roots and you do not find those little warts on the roots, they are lacking. You know the theory is that those little knots or nodules on the fine roots of the clover or alfalfa or pea or bean or any other leguminous plant, have within them bacteria that have the power of drawing in nitrogen from the air and the soil and feeding it into the plant, and fixing it there, making it valuable as a food product, and also as a fertilizing product when those roots are turned over. A great deal has been done along the line of experiment of the alfalfa bacteria, and they conclude that there is not the same bacteria on the medium clover plant, but there is the same bacteria found on the sweet clover plant. Down here at the Illinois station they have experimented somewhat and used that bacteria from the sweet clover plant, and have inoculated the soil for alfalfa, and it has produced the same organism as the bacteria from alfalfa. For some years we have sowed a little alfalfa in with some of our clover seed, not to get an alfalfa crop, but I thought it was a good thing for the lambs to pick at, and it grew so that we have a little alfalfa in the soil before we try to grow an alfalfa crop, and I find those bacteria on the roots. If you have sweet clover on the roadside, you can introduce some of the soil but do not take the seeds. We find if we do that there is no trouble.

A Member: Out in Kansas they have found such soil contains a good many bad weed seeds.

Mr. McKerrow: It is safer, of course, to use the soil from an alfalfa field. In most of Wisconsin fields, we are not going to keep the alfalfa up as well as they do in some places; for

instance, Kansas; because June grass is indigenous to the soil. At least it has been my experience that we cannot keep alfalfa in the soil more than five or six years.

The secretary read an invitation from Madison to hold the next convention there; also a letter from the mayor of Madison.

MADISON, Wis., Jan. 3rd, 1905.

To the officers and members of the Wisconsin Cheese Makers' Association, in convention assembled:—

GENTLEMEN—In behalf of the Madison Hotel Men's Association and business men of this city we extend to you a most cordial invitation to hold your next convention in Madison.

Madison is centrally located, easy to reach from every part of the state, and cannot be surpassed for beauty. It is the seat of the state government, and here is located the greatest dairy school in the country of which you all feel proud. If your committee should see fit to select Madison for your next meeting place we shall welcome you back here and make every effort to make your stay a pleasant one. We have ample hotel accommodations for all.

Hoping you will give this matter your consideration, we beg to remain,

Yours truly,

Signed, MADISON HOTEL MEN'S ASSOCIATION,
E. F. BUNN, *President,*
L. B. BURTON, *Secretary and Treasurer.*

MADISON, Wis., Jan. 2d, 1906.

U. S. BAER, Secretary,
Wisconsin Cheese Makers' Association,
Milwaukee, Wisconsin.

DEAR SIR—It is my pleasure, in behalf of the citizens of the most beautiful and picturesque city in America, to extend a most cordial invitation to hold your convention for the year 1907 within our gates. Our hotel facilities are excellent. Our citizens will extend to you a most cordial welcome, and I trust that your association will act favorably upon the invita-

tion which I have extended to you. Assuring you that you will not regret having selected this beautiful spot, for which nature has done so much, as the place for holding your meeting, I remain,

Yours very respectfully,
W. D. CURTIS,
Mayor.

SCOPE OF THE NATIONAL DAIRY SHOW.

In the absence of Mr. E. Sudendorf, secretary of the National Creamery Butter Makers' Association, Mr. J. H. Monrad spoke to the above subject as follows:

Mr. Monrad: I am always willing to help out "Sudy," but he makes a mistake when he says in his letter that I am fully conversant with the scope of that show. But I am conversant with one thing, and that is that the cheesemakers do not advertise as much as they ought to. There is no other business but what will spend considerable money on advertising, and from what I heard Mr. Johnston say yesterday about Wisconsin cheese, it seems to me it is only good business policy for you cheesemakers to send down cheese to that show and not only to send the cheese down there, but to cut it up and distribute it amongst the consumers, so that they may know the quality of good Wisconsin cheese.

Mr. Sudendorf has worked hard to make that show a success, and I feel confident it will be a great success, and while nominally it is inaugurated under the auspices of the National Creamery Butter Makers' Association, there will be a great dairy show with cattle and all kinds of implements and all kinds of cheese, and on behalf of Mr. Sudendorf I want to urge you to send down cheese to advertise the quality of the goods in that way. Sell it, if you want to; send it down and cut it into little packages, containing a quarter of a pound and sell them, or if you prefer cut them up in small pieces and give the consumers pieces of your cheese; in some way let the consumers know what good cheese is.

The date of that show is February 14th.

Let me give you a little incident which will illustrate what this getting at the consumer means. Several years ago they

made some experiment cheese in Madison, and they were all old cheese, and I had charge of feeling the market on the quality, and I went to South Water street men and they turned up their noses, they said, "Well, that cheese would be good for the saloon trade." Then I went to one of the best retailers who kept a grocery store. He appreciated it a little more, he was willing to pay fifteen cents a pound for it and wanted more. Then I cut up one of those cheeses and gave it to men on the train. I lived outside of Chicago seventeen miles and rode back and forth on the train, and I gave pieces of cheese to them, and I had no peace after that for about three months, those fellows on the train were always after me, "Gt us some of that cheese; we don't care if we pay twenty cents." You need to get nearer to the consumer and for that reason, I say send on your cheese, and either sell it or give it away in small samples. Besides that, you will see lots of interesting useful things there and you will enjoy a visit to the city of Chicago. I thank you.

The Chairman: We are lucky enough to have with us Mr. J. B. Schilling of Chicago. Mr. Schilling is editor of the Chicago *Produce,* president of the National Dairy Union, and as I understand president of the Iowa State Dairyman's Association.

Mr. J. B. Schilling: Mr. Chairman, Ladies and Gentlemen:—I can assure you that you are no more surprised than I am to see me standing here before you. I must take a little bit of exception to the statement of the president. I don't know how he got the idea that I was from Iowa. I must also take exception to the statement that I am editor of the Chicago Dairy *Produce,* I am what they call the "devil" down there.

I am not going to talk to you about cheese making. If I did you would soon find I was in the air; what I don't know about it would make a big book, but I am going to talk to you a very few minutes about the National Dairy Union. We never have taken any great pains to extend the work, but you cheesemakers and all cheesemakers of the country are really interested in the work that we are trying to do. I will go back into the ancient history of the organization, you all know how your grand old man, Governor Hoard, was one of the main factors in this organization, and how Secretary Charles McKnight of Chicago has worked for the association, and has done so much to bring about legislation for the dairymen. The association, I believe, is something that should have your support.

There is at the present time a move on foot to repeal the law that we succeeded in getting. We have all along been looking for some kind of a move to be made, but we did not know just what it was going to be, although we have figured that it would be along the line of preventing the coloring of butter instead of the direct repealing of the law. We do not believe that they are sincere in the move they are making now, because we cannot figure that they have got any show of success, but we do know this, that there has been a material change in the senate. We have reason to believe that a measure of that kind probably can be gotten through in the senate, but with the make-up of the house we do not believe it possible for them to effect any change in our present law; that is, if we use the power within our means to prevent it, which I assure you we are taking every measure to do. We will introduce probably in the opening days of the senate another measure in order to keep the oleo men busy. They are exactly like the idle boy—the devil finds some work for those idle hands to do, and if we can keep them busy instead of their keeping us busy, we believe we will accomplish what we have started out to do, and that is simply to prevent any change in our present law. We are going to undertake to amend the law compelling them to sell their product only in the original package. I am not going to tell you now why this should be, except to say this, that inside probably of the last ninety days in the city of Chicago the output of oleomargarine went up nearly two hundred per cent, and on any explanation that is something startling, and when we come to investigate we find that fully seventy-five per cent of this is sold as butter, and is taking the place of butter. We think if we can pass this bill that the internal revenue officers would have this matter under their control better. Commissioner Yerkes said that he would turn out every man in his place to work on the sustaining of the law in the city of Chicago. The commissioner in St. Louis told me yesterday that he had made thirty arrests during the last twenty days, had secured eighteen convictions and had assessed fines on all of them of from $200 to $600. This shows what has been done and what can be done by a proper enforcement of the law. During the month of November, their output was 3,694,366 pounds and in December in the face of the higher market and in face of the fact that they put forth greater efforts than ever before, the output was 3,413,577 pounds, a shrinkage of 280,789

pounds. While I have not the figures direct from St. Louis I understand that they are greater yet that is, that they have cut the output of the product a great deal more in St. Louis than in Chicago, for the simple reason that up to that time they never made any attempt to enforce the law there.

I do hope that we may enlist the interest and services of the cheesemakers, because, while it does not affect your product directly, it affects it indirectly. All of the milk turned into butter takes so much away from the cheese product. Over in Iowa, if we make any cheese, we have to ship it over to Wisconsin and have it come back again before it is any good. I don't know why this is, unless it is the lake air. A while ago when we first started this industry, we were going to make all kinds of money at it. We bought milk and skimmed it and made poor butter out of it, and put the butter back again into the milk and made cheese out of that, and so we got the reputation we did.

I believe it is to your interest to support the National Dairy Union organization so far as this—it is not a matter of dollars so much as sympathy and co-operation. I believe we can safely boast the largest membership of any such organization in the United States. Every creamery company that contributes to our support, the members of that creamery company become members of our organization, and I believe we can reach today between one and two hundred thousand men and get petitions going to the legislature that will compel them to recognize us as a power, and I hope you will add your strength too so that we may all work together. I thank you.

The Chairman: This matter will be taken up by the resolution committee and we are very glad to have heard from Mr. Schilling.

RECENT LEGISLATION AFFECTING THE DAIRY INDUSTRY.

J. Q. Emery, Madison, Wisconsin.

Wisconsin Dairy and Food Commissioner.

Mr. President, Members of the Wisconsin Cheese Makers' Association: I believe this is the third time that I have been invited to speak before this association, and always my addresses have been on the subject of legislation.

I am most heartily in sympathy with the remarks that your president made to the effect that the law is of little value unless there is a public sentiment behind the law, helping to sustain and enforce it. The dairymen of this state, the cheesemakers of this state, the buttermakers of this state, all these associations, the Wisconsin Dairyman Association, have in the past been earnest and persistent in the demand for certain measures from the legislature to promote the dairy interests of the state. I want to say to you that legislation of any kind does not come by chance, particularly legislation affecting such great interests as these. To secure legislation it is necessary at all times that some one shall be interested in it and shall follow those measures from the beginning of the session until it is closed.

I shall interpret "Recent Legislation" as including legislation of the last three years.

I have been among the number who hold that giving instruction in dairy matters, valuable and highly beneficial as that is, is not sufficient to secure the requisite results in the dairy industry. Not very many people act in accordance with their best knowledge, and many people are as lazy or indifferent as circumstances will permit. It comes to pass in this dairy business that the heedless, careless and untidy producer causes losses, not only to the public in the purity of product, but to the co-partners in the industry, who are tidy, intelligent, careful, painstaking and efficient producers.

In consequence it has been a belief of mine, which I have persistently and earnestly advocated, that in this great co-operative industry, where so many people and factors are involved, the law should regulate in the main the course of pro-

cedure. It should fix a standard of sanitary conditions and standards of honesty in all phases of the industry. It should fix a minimum legal standard for milk, and require all to meet those standards, and it is the duty of the state to make such legal provisions and enforce them. In other words, there is a place for law and its enforcement in this great dairy industry. The factor of law is a valuable and highly important one. It must reduce to a minimum the losses sustained by the public and by the honest, careful and intelligent producer caused by the heedless, unclean and dishonest producer. Persuasion only in this business is insufficient. Some coercion is a necessity and that is exercised through the police power of the state.

In 1903 the legislature added to the dairy laws of the state by defining unclean and unsanitary milk, and making it unlawful to sell the same or to deliver the same in any creamery or cheese factory or milk condensing factory. It also prohibited the manufacture for sale of any article of food from unclean or unsanitary milk or from cream from the same. It defines unclean and unsanitary milk as that drawn from cows that are kept in barns or stables which are not well lighted or ventilated, or that are filthy from an accumulation of animal refuse or from any other cause, or from cows which are themselves in a filthy condition, and milk in or 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.

In chapter 138 of the laws of 1905, the legislature declared as unclean and unsanitary milk that which is drawn from cows within eight days before or four days after parturition, or milk to which has been added or into which has been introduced any coloring matter or chemical or preservative or deleterious or filthy substance or milk drawn from cows kept in a filthy or unclean condition, or milk drawn from any sick or diseased cow or cows having ulcers or other running sores, or milk drawn from cows fed unwholesome food, or milk contaminated by being kept in stables containing cattle or other animals, and cream from any such milk or cream in any stage of putrefaction.

It is important that cheesemakers and buttermakers should know that the law forbids them to manufacture into cheese or butter any unclean or unsanitary milk or cream from the same, and that the manufacture of such unclean or unsanitary milk or cream from the same into a product for sale as human food

is a misdemeanor punishable by a fine of from twenty-five dollars to one hundred dollars or imprisonment in the county jail not less than thirty days nor more than sixty days.

I suppose that one purpose and effect of this law is to stimulate the spinal column of such cheesemakers and buttermakers as would otherwise manufacture into cheese or butter unclean and unsanitary milk or cream rather than lose a patron.

The legislature of 1903 enacted a law requiring that all premises and utensils employed for the manufacture or sale or offering for sale of food products from milk or cream from the same be kept in a clean and sanitary condition. That legislature further enacted that cans, bottles or vessels used in the shipment of milk or cream, where those bottles or cans or vessels must be transported over any railroad or boatline, must be emptied before the milk or cream in them becomes sour, and that they be immediately washed and thoroughly cleaned and aired before return shipment. Violation of either of these laws is a misdemeanor and punishable by a fine or imprisonment.

That legislature also made legal regulations for the use of the Babcock test, requiring among other things that cream should be tested by weight and that the standard unit for testing cream shall be eighteen grams. It makes it a misdemeanor to underread or overread the Babcock test or to falsely manipulate the same, or to make any false determination by the Babcock test or otherwise. Perhaps no law in its enactment or its enforcement was more needed in Wisconsin than this.

The legislature of 1903 also enacted a law which added an assistant chemist at fifty dollars a month for the dairy and food commission, and two cheese factory, dairy and food inspectors at three dollars a day and their necessary expenses. This was an addition of three to the force of the dairy and food commission, making the total number eight instead of five as the greatest number up to that time.

The legislature of 1903 also provided for the publication by the dairy and food commissioner of 10,000 quarterly bulletins, which should contain among other things the results of inspections of cheese factories, creameries and dairies. The legislature of 1905 increased the number of such bulletins to 15,000. There can be no doubt, I think, that the publication of these bulletins has added an improving and stimulating influence to the dairy industry in this state.

The legislature of 1905 amended the dairy laws relative to adulterated milk. It makes the sale or the furnishing or delivering of adulterated milk or adulterated cream a misdemeanor punishable by a fine from twenty-five dollars to one hundred dollars or thirty days to sixty days imprisonment. It changes the standard for milk and declares the following kinds of milk or cream to be adulterated and therefore unlawful: Milk containing less than three percentum of milk fat, or milk containing less than eight and one-half percentum of milk solids not fat, or milk drawn from cows within eight days before or four days after parturition, or milk from which any part of the cream has been removed, or milk which has been diluted with water or any other fluid, or milk to which has been added or into which has been introduced any coloring matter or chemical or preservative or deleterious or filthy substance or any foreign substance whatsoever, or milk drawn from cows kept in a filthy or unhealthy condition, or milk drawn from any sick or diseased cow, or cow having ulcers or other running sores, or milk drawn from cows fed unwholesome food, or milk in any stage of putrefaction, or milk contaminated by being kept in stables containing cattle or other animals. The term adulterated cream shall mean cream containing less than eighteen percentum of milk fat, or cream taken from milk drawn from cows within eight days before or four days after parturition, or cream from milk to which has been added or introduced any coloring matter or chemical or preservative or deleterious or filthy substance or any foreign substance whatsoever, or cream from milk drawn from cows kept in a filthy or unhealthy condition, or cream from milk drawn from any sick or diseased cow or cow having ulcers or other running sores, or cream from milk drawn from cows fed unwholesome food, or cream contaminated by being kept in stables containing cattle or other animals, or cream to which has been added or into which has been introduced any coloring matter or chemical or preservative or deleterious or filthy substance or any foreign substance whatsoever, or cream in any stage of putrefaction. This law raises the standard of milk in several particulars, but in addition to this makes the law clear in its meaning and workable.

The legislature of 1905 also amended the law relating to the sale of renovated butter, making the requirements for labeling the same much clearer and more rigid.

But of all the laws enacted by the legislature within the past three years, or within the past many years for that matter, by far the most important is chapter 390 of the laws of 1905. That law which was approved June 17th, 1905, provides for a second assistant dairy and food commissioner at sixteen hundred dollars a year; an assistant chemist at twelve hundred dollars a year; three creamery, dairy and food inspectors at twelve hundred dollars a year; four cheese factory, dairy and food inspectors at one hundred dollars a month and one chief food inspector at twelve hundred dollars a year. In addition to their salaries these officers are reimbursed for their necessary expenses. The law requires that the second assistant dairy and food commissioner, and the three creamery dairy and food inspectors shall be expert creamery butter makers, skilled in the technical work of creameries, competent judges of creamery products and versed in modern scientific and practical dairy husbandry. The law also requires that the four cheese factory, dairy and food inspectors shall be expert cheese makers, skilled in the technical work of cheese factories, competent judges of cheese factory products, and versed in modern scientific and practical dairy husbandry.

This law was secured by the result of a vigorous campaign conducted by the Dairy and Food Commission, The Wisconsin Dairymen's Association, the Wisconsin Cheese Makers' Association, and the Wisconsin Butter Makers' Association. It came as the result of persistent and long continued efforts during the session of the legislature. It is a great triumph. Its importance to the dairy interests of this state can scarcely be realized; it cannot be stated.

Until the year 1903, the Wisconsin Dairy and Food Commission was so small in numbers, in consideration of the vast amount of work it was required to do, as to be ridiculous. The addition of three men by the legislature of 1903 was sufficient to awaken some hope for the future. The addition of ten men by th legislature of 1905, making a total of eighteen members of the commission, and the legal provisions providing that only experts could be appointed to those positions, have made the commission of such size and character as to make it a recognized force in the great dairy enterprise in this state.

Between the Fourth of July and Christmas, all of the 2,852 cheese factories, creameries and skimming stations in this state have been inspected and reported by members of the Dairy and

Food Commission. The results of these inspections in sanitary and other lines have been of the most stimulating character. These inspections have been made with the sole purpose of enforcing the laws and securing a betterment of conditions in cheese factories, creameries and skimming stations which has been so long needed and so long sought

But this was only the beginning which is to continue in future years and which should and it is to be hoped will make the Wisconsin cheese factories, creamerics and the dairy industry in general second to no other state in the union. To this end your support and hearty co-operation is urgently solicited.

When we were seeking this increase in efficiency, one of the argumnts that was brought against such a law was,—that means places for politicians. We had to meet that, as you all know. Now, gentlemen, I invite your attention to that argument today. The law that was passed by the last legislature practically required that the men who should be appointed should be experts and that has been done. I tell you we had no right of way in this matter, no royal road to success; we had to fight for what we got, and we had to give our reasons to the committees and to the members of the legislature. We had to convince them that such legislation was to improve conditions purely along the line of cleanliness and sanitary matters, throughout the whole dairy industry, in the factories and creameries and upon the part of the patrons or producers. They were disposed to cut this bill, but I said, "Gentlemen, you must have competent men for this work. If you are to have incompetent men, you might just as well not pass this bill, and for my part we would rather you wouldn't pass it than to cut to such salaries or compensation that first class, competent, technically skilled men could not be employed. I said, "If you have to cut this bill, cut down the numbers, but I pray you, do not cut down the salaries of what men you have for this commission, but leave it so we can have good men to go into the field to work, and then you can judge the future by the work these men are doing. The gentlemen took that view of it, and they did cut the number. I asked for seventeen and they gave us ten. To be perfectly candid I never expected to get but ten. Well, they passed the bill; the question came up for the appointment of these men and it was up to me to make good what I had said to the members of this legislature. I looked over the field; I received applications from many good men in the state. Not all could be appointed.

In the early history of my administration there was a vacancy in the position of assistant dairy and food commissioner, and that position I had to fill with the approval of the governor. I went to the governor, and I said to him, "My notion of this is that a man to occupy that position should be a man who is thoroughly skilled in the dairy industry, who is an expert in judging dairy products, indeed, the law requires that. We have some young vigorous organizations in the state of Wisconsin, the Cheese Makers' Association, and in their constitutions they set up their purposes. It is the same with the Dairymen's Association, which we all recognize has been the strongest in all these years of any association in producing improvements throughout the state." I said that this commission should co-operate with these organizations and keep in line with these organizations. I said to him what I say on this floor, that a man who had ten or fifteen or twenty years' experience, but whose experience has never given him the spirit of progress and who is today where he was twenty years ago. if you put such a man in this position, it will be the blind leading the blind, and both shall fall into the ditch. I showed him that the kind of person we wanted in this position was a progresssive person, up-to-date in the business of dairying, knows it as it is today, and in looking for that man I came to the man who is your secretary, and I believe I have not to make any apologies for doing that. I found Mr. Baer and the position was tendered to him, and he took the position and holds it today.

You see I was after a man who was acquainted with the results of modern investigation in this great dairy industry, with the revelations which have been made in the matter of dairying, the new knowledge that has been brought to light by our Canadian friends and everybody else.

And these were the same arguments that were used when we came to fill these later positions. I found next your president, who had been occupying the position of instructor for the Wisconsin Dairymen's Association for many years, thoroughly skilled, who had been thoroughly trained for this work in the Wisconsin dairy school.

I found another man who had been instructor in the dairy school, trained in the dairy school, thoroughly versed and skilled in the Swiss cheese manufacture, your treasurer, Mr. Marty.

I found another one of your officers, Mr. Cannon, a graduate of the dairy school, skilled and versed in all the mysteries of cheesemaking. These men had these positions tendered them and they have accepted them and I trust that this is a line of appointment that must meet your approval, and I trust the time will never come in this association when the members of the Wisconsin Dairy and Food Commission shall need to make any apology for being members of this association and that no apology need be made for taking a man out of this association and making him a member of the Dairy and Food Commission. I am sure every member of this association and all these other associations desire that the Wisconsin Dairy and Food Commission shall be composed of strong, capable, energetic, vigorous, progressive, technical men; men who have this great dairy interest at heart, who want to see it improve, not content to let things be as they are. These young men have been instructed and they understand that it is their business to insist that the patrons shall deliver clean and wholesome milk at the factory and that they shall deliver it to clean factories, not to dirty factories. They were instructed to go over this state as rapidly as possible, and do good work. I said to them, I want you between factories to hustle, but at the factory I want you to do the best work you can; I want you to acquaint these men in the factories with the laws of the state with reference to cleanliness and sanitary conditions. If you find factories that are not clean, give them a reasonable time in which to put that factory in good condition, before you bring any prosecution. And that was done. Moreover, I said, "I want no prosecutions brought upon the report of one man, I want a second or a third inspection made so that there can be a report from two men and we can all be certain there is no unfair advantage taken of any man." We are to enforce these laws, this is the demand of this dairy industry and it must be understood that we mean business. No prosecution has been brought, except upon the judgment of two men. Now, out of the 2,853 creameries and cheese factories in this state what has happened? We have found the almost universal sentiment that when we find these conditions, these men are willing to go to work and clean up. Many men who are making cheese do not know what a clean factory is, and these men from our office have taken off their coats and gone to work in those factories and cleaned up the utensils and the vats, or part of them so that

the operators could see what a clean thing means by that object lesson.

They say to these men, "You must put your whole factory in that condition within a reasonable time," and in the vast majority of cases those factories have been cleaned up so that out of 2,583 we have been compelled to bring only about thirty prosecutions and that is something wonderful. Some of them thought we were simply bluffing and didn't mean what we were talking about but they found out that they must comply with the laws.

Now, in conclusion, as I have said, you people stand for progress. These men have been instructed to treat all men with civility and courtesy, and never under any circumstances, be provoked to be otherwise than civil, and so far as my knowledge extends, those instructions have been obeyed. In every case they report to me and of course the responsibility for these actions I take upon myself.

I thank you for your attention.

AFTERNOON SESSION.

The convention met Thursday, January 4th, 1905, at 2 p. m. The president in the chair.

YEAST AS A CAUSE OF GASSY FERMENTATION IN SWISS CHEESE.

DR. H. L. RUSSELL, Madison, Wis.

Director Wisconsin State Hygienic Laboratory.

This subject that I have to bring before your attention this afternoon is a good illustration of what co-operation is doing for the dairy industry in Wisconsin. It concerns the production of an abnormal fermentation in the Swiss industry.

This last year the Dairy and Food Commission was appealed to to find out if possible, the cause of an abnormal fermentation which occurred in this industry in a factory in Green county where practically the entire output of cheese was being lost as the result of some sort of trouble.

The inspectors under Commissioner Emery inspected this factory and found that the conditions were satisfactory so far as cleanliness was concerned, the method of manufacture of the cheese was in accordance with the best rules and practice, and they were unable to locate what the cause of this abnormal trouble was. At that time they brought some samples of the affected cheese to the experiment station to see if it were possible for us to locate the cause of the trouble and to see if after locating the cause of the trouble we could find some means of remedying the same.

I will pass around a few pictures of the cheese as showing the charactr of the fermentation, and that will indicate what I have to say. Here we see one of the affected Swiss cheese and the characteristic of this fermentation is noted especially in the cracking of the cheese along lines of least resistance, that is the conjunction between the side and the top of the cheese.

The formation of gas in Swiss cheese of course is a very common phenomenon which usually, however, is attributed to the development of gas-producing bacteria, which cause a fermentation of the milk sugar, and the formation of carbonic acid gas and hydrogen in various proportions. These germs are able to grow in Swiss cheese very much more readily than in the American cheese, for the reason that Swiss cheese is made up in a sweet condition and there is not that development of acid as in ordinary American cheese. In the American cheddar industry, the development of the straight lactic acid results more in the suppression of these gas-forming bacteria that do not have an opportunity of development. The Swiss cheese industry, therefore, is bothered a great deal with these gas troubles, and when this cheese was first brought to us, we thought it was one of these gas-forming bacteria that made the trouble.

Here is the picture of a cut section of one of these cheese. I will call your attention to the movement of the curd particles toward this point of least resistance. You will see from the

elongated nature of the gas holes that the curd is moving that way along the lines of least resistance.

Here is one of the whole cheese, the drum Swiss, showing the characteristic fermentation, which has a cracking of the cheese under the influence of whatever agent is capable of bringing about this change. Here is another one, in which you see a highly developed gaseous condition which of course affects not only the texture of the cheese, but its flavor, and very materially impairs the results obtained from such material as that. In fact, in this factory the man for the larger part of the season lost practically his entire output.

This man was buying milk outright and paying for it so much a hundred, and therefore the loss fell entirely upon him, and the loss inside of three months amounted to several thousand dollars.

An examination of this cheese did not reveal very much, we did not find the gas organisms present that we expected. The trouble, however, was so persistent and so severe that the factory was visited by a member of the Experiment Station in order to find out, if possible, if some condition prevailed in the factory which would be responsible for this trouble. When we got to the factory, we found it was possible, even at a glance, to tell where the trouble lay. The method of recovering the butter fat from the whey which was practiced in that factory was what is known as the cold system; that is, the whey was taken from the cheese kettle and placed in a vat, and allowed to stand and sour for a period of twenty-four hours. The fat, of course, then rose to the surface in this sour whey and the cream layer was skimmed off and set aside in a vat until a sufficient quantity was secured for churning. At the time we visited the factory, one could see bubbles of gas rising from this cold whey, and the vat of cream in the cheese cellar was covered with a layer of foam about six or eight inches in depth. There was a yeasty odor present, which at once betokened the presence of a yeasty kind of fermentation. This is exactly the kind of smell which we get raising bread. That of course gave us a very strong clew as to what the trouble was due, and upon examination of some of this cream it was possible to separate from it without any difficulty a yeast ferment.

Now, these gas-producing bacteria, or organisms, are most common in milk so far as abnormal fermentations in milk are concerned. Yeasts, however, have not been recognized as an

important agent in the production of these abnormal fermentations, and I therefore bring to you this abnormal fermentation and will consider it from two points of view. It has a decidedly practical application and then it is a matter of exceeding scientific interest, because the yeasts, as I say, have not hitherto been recognized as important agents in the production of abnormal fermentations. There are or have been a few instances describing the abnormal fermentations in cheese, caused by the presence of milk sugar splitting yeasts, but these milk sugar splitting yeasts are by no means of common occurrence. The ordinary beer yeast and ordinary bread yeast has absolutely no effect upon milk; you may add this material to milk directly and so far as the milk sugar is concerned, it is unable to ferment it unless that milk sugar is first converted over into dextrose, glucose. In milk, the sugar which is present is of course milk sugar, which is not susceptible to the action of yeast ferments. There are, however, a few yeast ferments that have a power of splitting up milk sugar and forming carbonic acid gas and alcohol, and this is an illustration of one of them.

I have a sample of an organism, which I will pass around so you will see what it looks like. It has a sort of a sweetish, sickish flavor. There is more alcohol in this than there is in a good many brands of beer. I tried to make milk champagne out of it.

You can see the fermentation which is going on, and you get the yeasty, alcoholic odor and if any one cares to taste it they can see that there is not a very disagreeable taste, a sort of a sweetish taste that is not so very bad. As this organism multiplies, however, in the milk, it produces in addition to the alcohol, a characteristic acid, producing a flavor, more or less undesirable. One of the characteristics which is effected by this trouble is that it has a sickish, sweetish flavor. There has been an yeast germ discovered in Canada, but the flavor there was a bitter flavor, while this organism produces nothing of any bitterness. It is a sweetish flavor and one of the characteristics which is the effect of this kind of yeast germ, is that it does not ripen rapidly, and the character of the cheese is materially different, not only with reference to the texture, but the flavor and the general appearance of the product.

Now, this organism we found very abundant in this factory, and one of the first things which we wanted to find out was the characteristics of this germ, so that we made a scientific study

of that organism to find out how difficult it was to kill; in other words, to get some idea of the life history of that germ so that we might be able, intelligently, to advise a factory affected as to the possible means of overcoming the trouble and, at the same time, as to how this organism got the upper hand of the original lactic acid bacteria that are generally present in milk.

I have here a number of bulletins which describe this trouble more in detail, and any one who is interested can secure a copy at any time; I will therefore not go into detail in this matter. We have that bulletin printed in German as well as English, knowing that a great many cheesemakers in these Swiss cheese regions are native Germans, who do not in many instances understand the English language.

Now, a few of the characteristics of this organism. In the first place, this is a yeast germ, and one of the first things desirable to find out was the conditions which favor the growth of this germ over and above bacteria of a gas-producing nature. We have right here the explanation and the description of this organism.

The dairy and food inspectors, when they made an examination of this factory, applied the Wisconsin curd test, and they failed to obtain at that time evidence of a gassy fermentation. One of the reasons of that was that this was caused, not by bacteria, but by yeast, and one of the characteristics of yeast germs is that they grow better in sour solutions than in neutral solutions. Bacteria, generally, grow more rapidly in fresh milk than in sour milk; yeast, on the other hand, prefers very much acid solution and in material, which is therefore, of a higher degree of acidity than normal milk, there are fine conditions, better for the growth of the yeast germ.

That explains why it is that in the Swiss cheese industry this particular organization is to be found very much more abundantly than in the cheddar industry or in butter factories.

We tested, for instance, the vitality of this germ, both in a dry and in a moist condition. We found that the organism was able to withstand drying for a long period of time, so that if a factory is once infected, we will say, this summer, that organism may remain there in a dry condition for a sufficiently long period of time so that it may wake from its dormant state the next season and re-infect the factory.

It is also able to retain its vitality in a moist condition, in old milk; in sour whey, the organism lives for many weeks and

consequently any such material around a factory gives an opportunity for the continuance of the life of that germ, and so will of course lead to its further spread.

It is important to know the temperature at which this organism loses its life. Most of the bacteria are destroyed at 140 degrees F., where this temperature is maintained for a period of ten minutes. This is what is known as thermal, the death point of an organism, and for most bacteria that do not produce spores this temperature of 140 degrees for ten minutes is sufficient.

Now, as you know, in the manufacture of Swiss cheese a much higher temperature is employed than that which is used for the American cheddar cheese and an attempt was made to find out whether the temperature, which was used in making Swiss cheese, was sufficiently high to kill this organism in the process of making, and experiments were made to test this point. The temperature which is employed by the best Swiss cheesemakers is 132 degrees F., 44 degrees Reaumur. Experiments were made in the highest medium, sour whey, for periods of fifteen, twenty, twenty-five, thirty and thirty-five minutes, and this organism retained its vitality, so that it shows that by the process of manufacture, the temperature is not high enough to destroy the vitality of this yeast germ.

Now, so far as methods of destroying this germ are concerned, we have found a two per cent hot soda solution to be very much the best for it. Although corrosive sublimate and formaline are recognized as the best standards that we have for disinfection of any organism, but we have found that the destruction of this yeast organism occurs more rapidly with hot soda solution than even with these strong disinfectants. A hot soda solution can easily be used for cleaning purposes, it has a solvent action upon fats and grease and therefore can be used in a factory and for cleaning utensils very easily and a two per cent hot soda solution has been found in our experiments to be the best germicide which we can employ. Washing utensils with it will kill this yeast ferment inside of two minutes, whereas a longer exposure at a much higher temperature fails to do so.

A Member: Is that what is known as sal soda?

Prof. Russell: Hot soda is a lye. It is sold under the term of ordinary lye.

There are certain processes which are followed in the Swiss cheese industry that in our judgment are responsible for the

introduction of this germ. You must remember that none of these organisms originates out of nothing. Prof. Meyer has been preaching to us right along in regard to the action of dirt and some of you may have gotten the idea that it was the dirt itself, that is the actual particles of soil and dirt which were responsible for all these troubles which we find associated with the dirt. That, however, is not the case, it is the organisms which are associated with dirt, which are the cause of the trouble, and the same thing is true with reference to disease germs. Typhoid fever cannot originate from any decomposing matter; diphtheria does not come from imperfect drainage in a house, but imperfect drainage and filth of various kinds are apt to serve as a medium for the distribution of the typhoid germ or other disease. In order to have a disease of this class, we therefore must have, first, the organism which causes that disease, existing in some outside source, and therefore we cannot get this abnormal fermentation in our factories unless the germ which causes this trouble, namely, this yeast germ, is introduced in some way from the outside. The most practical question which we can consider is how these organisms have been able in our Swiss cheese factories to undergo that degree of development which enables them to overcome the ordinary lactic acid bacteria.

There are two or three customs in vogue in the Swiss factory, which will account in many instances for this kind of trouble and those are conditions which are regarded by some workers as perfectly satisfactory. Other makers look upon them as being more or less unsatisfactory, but the true nature of that sort of trouble has not been pointed out in anything like the degree it ought to be, and those three practices are these:

First. The method of recovering the butter fat from the whey. That is one custom which gives the opportunity for the development of this yeast producing germ.

Second. The method of soaking whole rennets in sour whey, and

Third. The barrel method of whey distribution; that is, taking back to the farm in the same utensils used to bring fresh milk, whey that has been allowed to stand in barrels where they are not thoroughly cleaned out.

Now, let me point out how these various practices give an opportunity for the development of this gas-producing germ. Take the first one, the method of recovering the butter fat.

There are several methods which have been advised for the purpose of recovering the butter fat in the case of a Swiss cheese factory. As you know, of course, the manufacture of Swiss cheese leaves in the whey a large quantity of butter fat, and it is necessary, from an economic point of view to recover this butter fat and from it is made the ordinary whey butter. Prof. Farrington has explained this morning in regard to one of the methods most scientific, and the most feasible and practical methods for the recovery of this substance, namely, to take the whey and separate it with a cream separator and churn this cream which has been secured in this way.

Now, there are two other methods, other than this separator method that are used to a greater or less extent. One of those is to take the whey after it is taken from the cheese kettle and set it in the vat and allow that material to undergo a process of fermentation which results in the production of a large quantity of lactic acid, in other words, this whey reaches a stage of advanced souring. That souring process causes the butter fat to rise more readily than it otherwise would. Of course it would rise by gravity upon the whey in any event, but the souring process hurries this up, I presume by a cutting possibly of the albumenoids or caseins which surround these small fat globules. At any rate this sour whey is regarded as a necessary part of this cold process of recovering butter fat. This cream layer is then skimmed off and set aside; that is what is known as the cold process of recovering butter fat.

The other method of recovering the butter fat is to take this whey fresh from the kettle and heat it up to a temperature which will coagulate the albumen in the whey and also cause the fat to rise to the surface very quickly. This material is skimmed off and set aside for churning. That process is what is known as the hot process.

Now, let me call your attention to the comparative importance of the cold process and the hot process so far as giving an opportunity for the spread of this yeast germ. You will recall that I said that one of the conditions absolutely essential for the presence of this yeast organism is the presence of a large quantity of acid. In the hot process, we do not have that present, the whey is heated immediately and at a temperature which practically pasteurizes it and therefore kills out the lactic acid bacteria. In the cold process, however, that whey is set aside and allowed to ferment and therefore we have the

most ideal conditions for the development of acid, and therefore there is an increased opportunity for the growth and development of the yeast germ if, perchance, that germ happens to be present.

Now, we have made an examination of a large number of milks taken from various sources. We find that this yeast germ is very sparingly present in milks distributed here and there. For instance, at our University Creamery we found out of twenty-eight or thirty patrons this germ in the milk of four or five of them. Now, as I have said, if you take the cold process for the recovery of the butter fat, you get the most ideal conditions for the development of this yeast germ if it is present. I have here a photograph which will illustrate this. In some factories, for instance, both processes are used; that is, the cold process at night and the hot process in the morning to save time. At night they can take the whey and set it aside and allow it to sour, thus using the cold process for the night's milk, and in the morning they can heat up the morning's whey and skim it off quickly and thus use both the hot and the cold processes.

In this factory I spoke of, I took two quantities of whey, one heated by the hot process, the other the butter fat recovered by the cold process, and introduced bacteriological yeast cultures in order to see what were the conditions actually present in those two kinds of whey, and we have here photographs of the plate cultures; this one being a culture made from the cold process and this from the hot process, heating to a temperature of 140 or 145 degrees. One of these contains thousands of yeast colonies, while the other is perfectly free from them, showing the influence of the cold process of recovering the butter fat upon the development of this yeast organism. Under these conditions then, we see that the yeast germ grows fast, and therefore in this old sour whey, even if it is not held for a longer period than twelve hours, the conditions are such that the organisms are there in enormous numbers in comparison with what would have been the case if that whey had been heated up to the pasteurizing point.

Now, that is one of the conditions which determines the development of this yeast germ.

Another one is the method of soaking the whole rennet in whey solutions in order to extract the rennet out of it. Of course, in our American cheddar factories, we use almost uni-

versally the rennet extract, but the conservatism of the Swiss makers is so great that we find them using the old-fashioned rennets themselves. These rennets are placed in a whey solution and allowed to sour so as to extract the rennet out of them, and then this rennet is added to the milk to curdle the milk. For this purpose a jar is provided and these dry rennets are taken and placed in this jar and covered with a mass of whey. If, for instance, sour whey is taken or whey containing this organism in ever so small numbers, it is set aside in a warm place and allowed to incubate for a number of hours, the conditions are exceedingly favorable for the growth and rapid development of any organisms which it might contain, and in some factories we have found that this old sour whey, such as was found where the butter fat was recovered by this cold process, was used to soak the rennets in. The result was, of course, that every drop of that rennet solution contained, in addition to the rennet extract, which had been extracted from the whole rennet, a jar or small globe of germ life and where it was soured these yeast organisms were there in very great abundance. We have found several instances where the trouble arose in this way. One of those came to our attention through one of the members of the Dairy and Food Commissioners' force, Mr. Carswell, who found in a factory in the southern part of the state an illustration where this same kind of trouble was occurring in a brick Swiss factory. I have photographs where you can see that the cheese has been burst right open under the influence of this imprisoned gas. That trouble got into that factory solely through this means that I speak of, soaking the whole rennets in whey and allowing that material to incubate and develop, and then adding that material to the milk for the purpose of coagulating it. That was proven by the fact that after Mr. Carswell's visit to the factory, in place of using whole rennets, they used rennet extracts, and the trouble disappeared entirely, indicating that the source of the trouble was directly attributable to the use of the small quantity of whey in which the whole rennets had been soaked.

In this connection I want to speak of the other factor, namely, the method of the disposal of the whey in barrels. This method is not as widespread as it was some years ago, but it is altogether too common a method of procedure with our Swiss factories in the southern part of the state. We find some, many of them, providing their patrons with individual barrels

for the whey. Of course there is always left some amount of whey in the barrel, which inaugurates this process of fermentation naturally, and under these conditions it is impossible for the growth of these organisms not to take place. Sour whey gives you the most ideal conditions for the development of it, and the result is that this whey placed in these individual barrels is in a much more advanced state of fermentation than if the whey was disposed of in a more sanitary manner. This whey pollutes the milk cans, the milk cans are infected with this yeast organism, and even if the milk can was thoroughly cleaned on the farm, which it is not, and cannot be without the use of steam, it would still be dangerous. A complete disinfection requires the use of scalding water for a long time before this germ is killed. The result of all this is that in the Swiss cheese regions the cans are infected much more with this yeast germ than in any other portion of the state.

We have been making a canvass of this matter, examining milks from not only the cheddar region and the Swiss cheese region, but in Canada and we find that this yeast germ is very much more abundant in southern Wisconsin than in the cheddar regions or any other portion of the United States, although we found them all over to some extent. The reason of that lies not in the greater susceptibility of this milk, but simply that the conditions under which the milk is handled are such as to procure a much more rapid development of these organisms which are normally present in milks in very small numbers.

When we come to understand the life history of this organism and the way in which it gains access to milk and is propagated in the factory, it becomes a very easy matter for us to put into operation methods of control which will succeed in wiping out entirely troubles of this sort. I have no fear of troubles of this sort gaining the upper hand of us as long as we know how the thing originated, because it is possible to hold the thing in check. The case is an exceedingly interesting one, as proving the benefits which come from coupling up science and practice together. As I say, the work has been done largely through the co-operation which has been carried on by the Dairy and Food Commission. This fermentation would not have to come to us for the purposes of scientific study had it not been that it was found by the factory inspectors who are keeping in close touch with these men, who are going up and down through the state and whenever they run across abnormal troubles, which they cannot get at, they pass it along and give

us an opportunity for scientific study of the question. I think in a very large measure, the success of what has been attained in Wisconsin, both from the practical and the scientific sides, comes from the co-operation that we find in this state; that all the forces are working together and are co-ordinating their methods along these lines so that the aggregate is very much greater than if we were each working independently, and I am very glad to bring this to you as an illustration of what science is doing for the dairyman and cheesemaker when it is also dealt with from the practical point of view.

Prof. Emery: Mr. President, Dr. Russell has inidcated one particular in which co-operative effort upon the part of a portion of these dairy forces can bring about important results, and I was reflecting on the inestimable value to this association, to this body of men, to this great dairy industry of a man whose preparation is ample, devoting his life to this cause of taking up troubles of this kind when they arise, many of them new and which would in olden time simply appeal to our imagination and wonder, and which would give us infinite trouble, but here the man of science devotes his energies to this, he studies the problem and he comes to us with a scientific conclusion; he brings us the truth concerning which there can be no doubt. Now, we know the cause of the trouble we know how it can be remedied and save immense loss. It simply indicates in another way, that in all this work of dairying we need to have open and receptive minds, and we need to call to our aid all these various forces which contribute to our success.

Then, this idea of co-operative effort. Here we have the dairy school and the dairy and food commission and the Wisconsin Cheese Makers' Association and the Wisconsin Butter Makers' Association and the Wisconsin Dairymen's Association and the dairy press, all these things. Now, suppose that these various strong forces were permeated with little petty jealousies and they pulled apart and got to criticising each other, you can easily understand how quickly the dairy interests of the state would suffer. But let all of these forces, as they have in the past, look above these little petty jealousies and pull together and we can be strong, we can be successful. We all know how it has been with the Wisconsin Dairymen's Association. This is an offshoot of that association, and we appreciate the tremendous power it has been in this state and the secret of that power is, that there were thirty-two or three years ago

some men interested in this great dairy cause who, seeing that individual effort was not sufficient, combined for co-operative effort and study. They formed that association and those men have always been men of vigorous, intelligent, independent thought; they have been open and frank in their discussions, but there have been among them no jealousies, no bickerings, and that has been in my judgment the secret of its great power. We need this co-operative effort all through the state, we need to have minds open and receptive, and the only thing we want to beat or get ahead of is ignorance and lack of progress. If we will do this, if we will pull together, we can make the dairy interests of this state stand where they ought to be, second to no other state in this union.

ADDRESS.

HON. EDWARD K. SLATER, St. Paul, Minn.

Minnesota State Dairy and Food Commissioner.

Mr. President, Ladies and Gentlemen: Some way or other I feel at home when I get to Wisconsin, though I never have lived here. But my father and mother were raised in Wisconsin and spent their younger days within your portals. My father served in the army, enlisted from Camp Randall in the 37th Wisconsin. Further than that, my mother went to school to your dairy and food commissioner, Mr. Emery, so I feel I have claims upon Wisconsin.

It is a great pleasure for me to be here today, though I am not here to try to tell you cheesemakers how to run your factories. We do not have very many cheese factories up in Minnesota and we couldn't get a cheesemakers' convention together. I think we have not more than twenty cheese factories running at the present time, though there will be about sixty when the summer comes around. With us, the manufacture of butter is more popular. We can get good cheese by sending over to Wisconsin.

I want to say just a word regarding the dairy and food department work up in Minnesota. We are simply trying to do

the best we can, and I am glad to be able to tell you what our legislature is doing for the dairy and food department. At no time since I have been familiar with the work of the department, which is nearly four years now, has there been less than fifteen men connected with that department. At the present time we have a force of twenty-seven people, five of them young ladies, we have at the present eighteen men in the field. We have only one cheese inspector, and he fills out his time doing some creamery work. We have ten dairymen devoting their attention to the inspection of dairy interests in the state. They are practical creamery buttermakers, and give instructions to the creamery buttermakers. We have something like 750 creameries operating at the present time. A man likes to be loyal to his own state, and I would like to be able to say we have as many creameries as Wisconsin has and we would like to have our people feel that Minnesota is the only dairy state on the map.

Our law requires that the dairy and food commissioner shall be a practical dairyman. It does not say whether he shall be a practical cow expert or practical buttermaker. As to the inspectors, the law simply states that they shall be men specially fitted to perform the work they are appointed to perform. That law has not worked out in practice as well as it might have done, but we are making improvements and our six creamery men who are in the field are practical buttermakers.

We must not forget to look at the other end of the business, the food interests of Minnesota and of Wisconsin are of just as much importance, they need just as much looking after as the dairy interests and we are trying to do what we ought to in that direction.

At the last session of our legislature, a law was passed providing for a civil service system, for the examination of applicants for positions on the force, and beginning with January, 1907, a man in order to be appointed as a dairy inspector, must pass a satisfactory civil service examination by a board, appointed for that purpose. Then it lies with the dairy and food commissioner to pick his men from those applicants who have passed a satisfactory examination. Just how that is going to work out I don't know; we hope for the best, and believe that if we can keep politics out of it it is going to accomplish some good results. But there is another provision of that law which is going to do us some good, a man cannot be removed from the

force after he is once appointed without a satisfactory reason for its being done. He must be wholly incompetent, or must have done something that will justify the commissioner in removing him, he cannot be removed for political reasons, and if he is removed the commissioner must file a complaint against him with the secretary of state and the man is allowed a chance to defend himself before he is put off the force. We hope that at least is going to result in keeping good men in the department after we have got them. That law simply applies to the subordinates in the department and not to the commissioner.

I want to say just a few words that will apply to cheesemakers and to the patrons of their factories. We have a live lot of buttermakers out our way, and I want to say I have attended a great many state dairy conventions and I never saw a more earnest lot of men than I see right here today. You seem to be taking a deep interest in your proceedings and there is no reason why you ought not to keep this reputation for being the best cheese organization that we have in the country, if not in the world.

Why is it that you make such good cheese in Wisconsin? Why is it that up in Minnesota we can make better butter than we can cheese and we don't do anything at all in the cheese business? Is it because the Mississippi river flows between the two states? I don't think so. I believe we can make just as good cheese in Minnesota as you can in Wisconsin, but when the farmers of a community up there begin to look for a market for their milk they never think of a cheese factory, they think of nothing else but a creamery. Even our dairy school, our dairy and food department, and our different organizations all seem to be more interested in butter, and so the butter industry has grown there and the cheese industry has not, and even those who have been thinking of going into cheese factories changed their minds. The separator has had something to do with this, so we do not expect to do much with the cheese industry.

I want to say one word to strengthen the statements made here this afternoon, that we cannot succeed in promoting the dairy industry in any state unless all influences work together for education and progress. You are doing it in this state and I am glad to see it. We are doing it over there. Our inspectors in the dairy and food department are many of them from the dairy school. The officers of the Minnesota dairy association are lecturers with the farmers' institutes, the whole thing

is twined together and they are doing good work and you are doing the same here and you are keeping politics out of it as we are. It is a crime for a state official, a state dairymen's association or a cheese makers' association to receive a state apportionment and then go out and spend that money trying to build up a little politics in their association to down somebody else.

Wisconsin like Minnesota has got the right men regardless of politics to do this work, and we are getting the right laws, although it is not so much what we have in the way of a law as it is to see the law enforced. You have good dairy laws here, but no matter how good they are they must be enforced to produce good results. You must have the sentiment in order to enforce the law. We have a law in our state that the standard measure of milk should be 282 cubic inches to the gallon, while the standard we all use is 232 liquid measure, and in order to enforce that law we would have to change all the measures in the state. In a case like that the sentiment would certainly be against the enforcement of the law, and if your people up here in Wisconsin did not believe in having pure food products, it wouldn't do your commissioner any good to go out and try to enforce the law, and I am glad to know you have a good strong sentiment here for the enforcement of pure food laws. And so if your inspectors find a dirty buttermaker, they should use their judgment and the commissioner should stand behind them. I think the commissioner should say to his inspectors, "If you find a dairy school graduate that is keeping a dirty creamery, go after him harder even than you would the other fellow." The buttermaker that will go to the dairy school and receive the teachings and the spirit that he will at any of our dairy schools and will then go out and operate a dirty factory, ought to be run clear out of the business.

We have not had as many prosecutions as you have, we have had 520 since the first of May, not so many of them in the dairy work as in the food work, except in the cities of Minneapolis and St. Paul where we prosecuted over seventy-five dairymen for maintaining dirty dairies and watering and skimming their milk. There is one thing, however, in which the inspectors cannot help you cheese factory men and that is in the quality of milk you receive at your factory, you must look after that yourself. Some patrons will always bring as poor milk to the creamery or the cheese factory as the maker will

allow him to bring. In one county in our state the milk from a hundred and fifty patrons was examined, and over a hundred of them were delivering milk in cans not fit to contain human food. I remember in one place there were eleven ten-gallon cans of milk in a bunch and in taking the covers off of those cans, there wasn't one cover in the outfit that you could see the tin on the inside of the cover, it was simply rounded over on the inside with that—cream, the owner called it.

In that factory I brought a case against two of the patrons as a warning and against the buttermaker. They all pleaded guilty and paid their fine of $25 and costs each, but I tell you I took a great deal more pleasure in prosecuting that buttermaker than I did his patrons. That buttermaker was making the business his life work, and he knew better than to keep his creamery in the condition it was, and knew better than to receive milk in that condition. It is the butter or the cheesemaker who is right there all the time, who is the man that is going to determine what the quality of the milk delivered there is going to be. Another thing I don't like to see, and that is a butter or cheesemaker who will throw up his hands the first time he begins to get bad stuff at the factory and call up the creamery inspector. The duty of the creamery inspector is to help out the buttermaker when he can, but our makers are apt to expect too much of the creamery inspector and send for him every time some little trouble comes up. The buttermaker himself is the man to straighten out tangles and put things in better shape and he can do it, too, if he is the right sort. He has got to have an influence in that community. It isn't sufficient that he knows how to operate a creamery or a cheese factory, he must have the confidence of the people of that community, he must be an honest man; he must be a sort of a diplomat and know how to get along with this and that man, how to smooth things over and be nice with every one in the community, and if he is that sort of a chap he doesn't have any trouble with the quality of the milk and cream at that factory, that thing regulates itself. In that factory of which I spoke, the maker lost his position and in a few weeks after another fellow went to work there. He and the creamery inspector got together and looked over the product of the one hundred and fifty patrons, and found that there were not more than one in a half a dozen cans in all fit to make butter out of, but that buttermaker had the right kind of stuff in him and he

brought order out of chaos. A cheesemaker in a community is going to build up or bust up the business in that community, if he stays long enough, and there is more depends upon him than any other factor in the business. If, in the first place, we had the right kind of material to run a factory with, in the second place we must have a first class operator, and if we don't have him, it doesn't make any difference how much or how good material we have, we never can build up the business.

I cannot say to you here that I bring to you the greetings from the Minnesota cheesemakers. I would like to, I wish we had an association over there as strong as yours is and as many cheese factories as you have. But I can leave with you the greetings of the buttermakers and our dairymen and we have a good dairyman's association and a good buttermakers' association. I want to say to you boys here that I hope you will continue to simply work along together as you are working; work with your dairy and food commissioner: work with your dairy school. We generally find that the successful cheesemaker, the high-toned fellows are the fellows that come to the conventions. I am not going to take any time scolding the cheesemakers of Wisconsin who do not take an interest in such affairs as this; they are not here. You don't find that sort of fellows at the conventions, you find here the bright, wide awake boys who are taking an interest in the business. You will see some faces year after year at our dairy conventions, and it simply means that the success of the industry falls upon the work of a few.

We are talking about the good cheesemakers of Wisconsin, the good buttermakers of Wisconsin. You have some awful poor ones and so have others. I believe we have some as poor buttermakers up in Minnesota as there are in any state in the union. The reputation of the state won't make good workmen, either in Wisconsin or Minnesota, but you fellows that are ready to get into the harness and work together and strike for the success of the whole industry, I hope you will work right on, all pull together, co-operate with your dairy and food commissioner. Let us all do the very best we can in the little niche in which we are placed and take advantage of what we have to work with. There are men who have been making butter twenty years and they are just where they were when they began. Those men will never build up the industry and never contribute toward the progress which other men's industry is bringing about.

But these other fellows who have no time for book learning and conventions, the best thing we can hope for for them is to let them get out of the way and let some one else take their places. So I want to again urge upon you to do the best you can where you are. I want to see Wisconsin provided with a larger dairy and food force. Now, the next time you go before the legislature, Mr. Emery, ask for twenty-seven men instead of seventeen and ask for a larger appropriation.

Up in our state we have $35,000 appropriated each year. Together with that we have the fines collected for licenses and money taken in from dairymen, which amounts to something like $50,000, and then we can go ahead and appoint all the creamery inspectors that we can hire with the funds we have to use.

I want to see Wisconsin do what she wants to do, she is not doing what her dairymen want to do. You in this association are all united on the fact that you ought to have a larger force of dairy and food inspectors, and every dairy association in the state no doubt has that same idea. Do your legislators have that idea? Apparently they do not fully, and it is for every man who has the interest of the work at heart to get busy with his legislator and tell him just what he ought to do. Get your community interested and working with this legislator, asking him "How do you stand on this dairy work? Will you stand for what we want in the way of better legislation and in the way of more appropriation for the different associations that work for the dairy and food department." You can do more in that line if you simply get down and do it. I thank you.

The Chairman: As far as I know, Minnesota has had one of the most efficient state dairy laws and the best equipped dairy and food commissioner's office of any state in the union which has been shown in its results. I am sure it has been refreshing to all of us to hear Mr. Slater and I am very glad to have him here.

CHEESE AS A FOOD.

Miss Emma Conley, Wausau, Wis.

Domestic Economy, Marathon County School of Agriculture and Domestic Economy.

Of all the articles of diet, it can be safely said that no one so well fulfills the requirements for a complete food, as does cheese. This statement may seem strange to many who are accustomed to think of cheese simply as a condiment, a salad, eaten with dessert, or served under an imported name in fanciful form as a course at a dinner party. These highly flavored varieties are of value too, as they excite the flow of gastric juice and, if taken in moderate quantities, aid digestion instead of retarding it, as some think, but I shall confine my talk to the great product of Wisconsin, the American cheddar.

In Europe, where meat is scarce and beyond the means of the peasantry and poorer classes many varieties of cheese are made from whole milk and skim milk, and cheese serves as the important article of diet. It takes the place of meat and supplies the proteid element that is essential for tissue building. The result is a healthier class of people, stronger, better tempered and with better nervous systems than those burdened with diseases due to over consumption of beef, mutton and pork. The law of compensation applies here as elsewhere, when great economy must be exercised. Nature provides means for people to supply all their wants with the least injury to themselves if they only exercise a little judgment and learn to use what they have; where, as in America, we exercise no economy, we overload our system with meat and suffer from diseases of the stomach and intestine. A careful study of dietaries limiting the amount of meat used is one of the greatest needs of our people, from the standpoint both of economy and health.

The value of any food depends upon three things; composition, digestibility and cost. A perfect food must contain all the nutritive ingredients needed for yielding heat and energy and for building tissue. It must be readily digested and the price must be low enough to make it an economical food. As to composition, the value depends on the presence of three classes of nutrients—proteid, fat and carbohydrate. Proteid

is the all important because it contains the nitrogen essential for building and repairing tissue. A study of the chart will show you that proteid foods are the most expensive. Where we can get proteid in a vegetable food, in a cheaper form there is so little of it in proportion to the carbohydrate that we would have to eat great quantities of the food to secure the amount of proteid needed and the system would be overburdened with excess of carbohydrate and cellulose, that must be gotten rid of and this gives extra work to the intestines. Vegetable proteid is harder to digest than animal proteid. Atwater's tables give the digestibility of animal proteid 97%, that of vegetable proteid 84%. Cheese contains about 26% proteid. A small quantity of cheese grated and added to vegetable foods would secure a balanced ration and prevent excess of carbohydrate.

Cheese also contains about 34% fat. Fats and carbohydrates are our sources of heat and energy, they practically do the same work. However, a food can be too good, it can supply heat, energy and build tissue as does cheese, but it may be in so concentrated a form that it does not supply bulk enough to expand the digestive organs and thus fully call out the juices essential for complete digestion. This is the reason why fat cannot wholly take the place of carbohydrate. But carbohydrate as the chart shows is cheap and easily procured and when our proteid foods are mixed with vegetables the perplexing question in food economy is solved.

As to nutritive ingredients the chart shows that cheese contains twice as much nutrition as beef, mutton or fish; four times as much as chicken, for it contains no refuse. It is both nutritious and economical; now as to digestibility, by digestion we mean the chemical changes which food undergoes in preparation for its absorption into the blood. The work is done by the digestive juices but they cannot work well unless the food is finely divided by chewing or broken up into small particles before it enters the mouth. The digestive juices must be thoroughly mixed with the food.

The digestion of cheese begins in the stomach and is completed in the intestine. When cheese is referred to in this connection you may understand it to mean well cured cheddar. I take no responsibility for the fresh India rubber varieties that we sometimes find on the market. Fresh rubbery cheese is very hard to digest because it cannot be broken down by the teeth, it

enters the stomach in lumps. It is responsible for most of the prejudice against cheese, for it is the variety that the stomach finds hard to digest. In well cured cheese the casein is broken down, it is digestible and fit for use. Skim milk cheese being almost pure casein is hard to digest in bulk, but in the cheddar the fat separates the floccules of casein and makes it soft, friable, rich, more easily digested. Cheese is regarded as difficult of digestion because it is not thoroughly masticated or eaten in too great quantities, because it is cheese in which the casein is not broken down or skim milk cheese; but the soft, rich, crumbly cheese is digestible and stimulates the stomach thus aiding in the digestion of other foods. For authority I quote the following from experiments made by Prof. Harry Snyder of the University of Minnesota. I might also quote from European authorities but this one is sufficient. It is the "result of human food investigations made to find the digestibility and food value of beans, cheese, oatmeal, flour," etc. In this experiment he says, "the ration consisted of cheese, bread and milk. The best quality of Minnesota cheese, of good taste, and flavor and well cured was used. The analysis showed that the cheese had been made from a good quality of milk containing from four to 4½% fat. Compared with other foods cheese is characteristically rich in both fat and protein. Ordinary cheese is composed of about 1/3 each of water and fat and about 1/4 of the weight is crude protein in the form of casein. The mineral matter, sugar and other compounds present in small amounts make up the balance of the composition."

Digestibitity of cheese and bread and milk ration.

	Per cent. digested.	Per cent. digestibility of cheese alone.
Protein	92 69	93.36
Fat	94.55	94.5
Carbohydrates	96.55	
Available energy	88.08	92.59

The table shows that as far as completeness of digestibility is concerned, the nutrients of cheese have a high degree of di-

gestibility, the protein being 93.36 per cent and the fat 94.50 per cent digestible. Ordinarily cheese is considered indigestible, but it is not indigestible in the sense of lack of completeness of the digestion processes. It is slow of digestion and has a tendency to cause constipation if used in excessive amounts or if not properly combined with other foods. Experiments have shown that when cheese is used to the extent of one to three ounces per day, it does not unfavorably affect the digestion, but, if anything, it favorably influences the process or digestion. Koenig has shown that when cheese is consumed in small amounts with other foods it is valuable not only because of the nutrients present but because it tends to make the foods with which it is combined more digestible. He found that when cheese was added to a ration consisting of maize (corn) meal, the digestibility of the protein was increased from 58 to 93 per cent. The main portion of the work of digestion of cheese is carried on in the intestines rather than in the stomach. This is probably the reason why cheese is characterized as a "hearty food" and frequently causes digestion troubles when eaten. In such cases the amount of cheese consumed should be reduced to correspond with the digestive capacity of the individual. Cheese should be consumed in small amounts and by so doing the digestive powers of an individual can be strengthened and not impaired.

Cost of Nutrients in Cheese.—Cheese should be used in the dietary regularly and in reasonable amounts, rather than irregularly and then in large amounts as it frequently is. Cheese is not a luxury, but ordinarily it is one of the cheapest and most nutritious human foods that can be procured. A pound of cheese, costing fifteen cents, will contain nearly a quarter of a pound of protein and over a third of a pound of fat. For the same amount of money it is possible to secure a larger amount of digestible nutrients and available energy from cheese costing fifteen cents a pound than from meats costing ten cents per pound. In the use of cheese in the dietary, the same precautions should be observed as are exercised by successful feeders of animals, namely: to begin gradually and not to use a concentrated food in excessive amounts. The amount of cheese that can be used in a ration can be determined only by the individual.

As to the serving of cheese. Some of the fancy varieties can well take the place of sweets or desserts at dinner. They are

as appetizing as pies and puddings and instead of retarding digestion, they aid it. However, we are not considering fancy varieties but confining discussion to American cheddar.

From what has been said before we know that if cheese is finely divided and mixed and blended with other foods its value is of the greatest. The method of finely dividing cheese is to grate it and because the Italians are masters in the art of serving cheese and use their hard Parmesan cheese, Americans have come to think that that is the only variety to use in cookery. Strange how foreign names lure the average American. Parmesan being a hard, skim milk cheese is easily grated but it lacks the richness, the fat in our American cheddar, and so cream must be added to dishes made from it. Cheddar, if allowed to dry, or if the outer part is used, can be easily grated and is superior to the Parmesan and much cheaper, cheddar selling at 16 cents a pound and Parmesan from 60 to 80 cents a pound.

Moreover when grated cheese is wanted we need not wait to get dry, hard cheese. The cheese can be chopped with the chopping knife and used in cooked dishes or, if for serving, it can be chopped and allowed to stand a day and it will be as dry and fine as grated cheese.

Thin soups are delicious with a tablespoon of grated cheese sprinkled over them. Grated cheese is also served with boiled macaroni, boiled rice, with baked potato scooping out the inside of the potato and mixing it with grated cheese and refilling the shell. The heat of the soup, rice or potato melts the cheese and makes a very palatable and digestible dish.

If cabbage, cauliflower and other vegetables are boiled and then grated cheese and white sauce are added and the whole cooked at a low temperature the result is a nutritious addition to a dinner. Potatoes parboiled and cooked in the same manner furnish a dish that supplies a balanced ration. We are most of us familiar with cheese omelet, baked macaroni and cheese, rice croquettes with cheese, but the most nutritious and wholesome dish is cheese fondu. It is made from milk, bread crumbs, cheese and egg. Its nutritive value is higher than meat and it could often serve as the substantial dish for dinner with great advantage to the cook and the partaker.

In cooking cheese care must be taken not to subject it to a high degree of temperature, for it makes the casein indigestible. If cooked at a low temperature it is melted and delicately

cooked. If bi-carbonate of potash in proportion of ¼ oz. to 1 pound of cheese is added when cooking cheese the digestibility is increased because the alkali neutralizes the fatty acids and makes the casein soluble. Williams in "Chemistry of Cookery" says that the indigestibility of cheese is due to the absence of the natural salts of the milk and that bi-carbonate of potash replaces them.

I might tell of many other ways of adding cheese to other foods but I have said enough to show the limitless possibilities. Cheese can play the important part in the diet of the vegetarian, the man who has decided that he is healthier, stronger and better tempered without meat; to the poor it can furnish nutrition cheap and in a palatable form; for the housewife it can often take the place of meat and save time and fuel in preparation and add variety to the diet. As Dr. Snyder said, cheese should be used in the dietary regularly and not be considered a luxury for it is one of the cheapest and most nutritious foods procurable.

CHART I.	Refuse.	Water.	Protein.	Fat.	TAKEN FROM ATWATER.	
					Carbohydrate.	Mineral matter.
Nutriment in 1 pound—	Per cent.	Per cent.	Per cent.	Per cent	Per cent.	Per cent.
Cheese	.....	34	26	34	2	4
Beef, round	8	61	18	12	.....	1
Mutton	19	43	13	24	.....	1
Chicken	35	48	15	1	.....	1
Beans	.....	13	22	2	59	4
Bread	.....	35	10	1	53	1
Mackerel—salt	23	38	17	17	.....	10

THE NECESSITY OF MORE PERFECT CO-OPERATION IN A CO-OPERATIVE BUSINESS.

Hon. I. W. STEINHOFF, Stratford, Canada.

Mr. President, Ladies and Gentlemen: It is a great pleasure for me to meet the cheesemakers of Wisconsin. You will allow me to convey to you the congratulations of the cheesemakers, dealers and those engaged in the industry in Canada. I will take this opportunity to do this, although Mr. Johnston, the president of the dairymen's association of western Ontario is present; we are both closely identified with that association.

Every individual man has a two-fold relationship in the community in which he lives. One implies self-interests, self-preservation, and things pertaining to his individual welfare and prosperity, and the other, the wider and more comprehensive relationship of that to his fellow men in the community at large.

Men who allow their energies to be entirely absorbed in the gratification of the first, are apt to become narrow, warped in their ideas, and unsympathetic with all matters except those which advance their personal interests and prosperity.

It is in the development of the wider relationship of that to the community in which he lives and the exercising of thought for the welfare of others, which has in all ages, developed the best traits of character and type of manhood that the world has seen.

There are some things that can be accomplished by individual effort without the assistance or interference of others; but there are many others that cannot be accomplished by the individual except in co-operation with his fellow-man.

The dairy industry in America is decidedly of the latter class, and is strictly a co-operative business, and it was only by co-operation in the establishment of cheese factories and creameries that the quality of our cheese has been brought up to the standard to which it has now attained in both British and American markets. The men who have been a long time in the cheese business in Canada, look back with considerable amusement upon the time when cheese were turned out by individual farmers in the home dairies, and sold only two or three times in the season; so that when a carload of cheese was

required, it would of necessity consist of about as many different grades of quality as there was of individual make constituting the car, which in many cases run up to 10 or 15. While this state of things existed, and such a variety of quality was being turned out, mostly inferior, not much progress was being made; there was no established market, and the goods met with a very poor reception in England where the surplus had to be sold.

It was under conditions such as these that a few of the more enterprising and wide-awake men who were engaged in the dairy business at that time, conceived the idea that to establish factories in every community and have a large amount of milk sent to one centre, where it could be treated by one skilled person as the means of getting a more uniform quality, and of a higher grade.

For the purpose of accomplishing this, men were brought from the state of New York to teach us how to make cheese in Canada. Factories were established and the principal of co-operation was furthered, until in Canada, today, we have become the great cheese-producing country of the world.

But we have to acknowledge that we have arrived at the point where we are not quite certain whether we are making any advancement in point of quality or not during the past few years; and while the principal of co-operation has accomplished a great deal in the United States and Canada, in the development of the dairy industry, yet I think we will all admit that our present system of co-operation is not by any means perfect or what it should be, and I believe that the want of more perfect co-operation in many respects is one of the greatest weaknesses in the factory system at the present time.

I cannot better illustrate the different stages required in the production of milk, the manufacturing of it into cheese and the delivery of the same to the consumer, than by comparing them to the links of a chain, and it seems to me that we might well say that in this process of development in manufacturing milk into cheese and marketing the same, there are five links,

1st, that of the producer of the milk.

2nd, the manufacture of that milk into cheese.

3rd, the buyer.

4th, transportation of the cheese to the markets.

5th, the consumer.

Now, it is well known that no chain is stronger than its weakest link, so that I purpose for a few moments to examine

the links of this chain, and if possible, to give you an insight into their relative strength or weakness.

First then, as to the farmer or producer of the milk: Do we find farmers as a rule willing to impart any knowledge that they may possess to one another, to consult with one another regarding the best cows to keep, the best and cheapest food to produce, and the best methods of caring for the milk after it is drawn?

I fear that there is too often a spirit of rivalry allowed to predominate and that if one dairyman finds that he is able to produce milk more cheaply than another, if he can keep it more successfully, and deliver it in better condition, he is not always willing to give this information to his neighbor, and I am quite certain, that in the majority of cases where dairymen are doing badly, getting such a small quantity of milk from their cows, and at so great an expense, that it does not pay to keep them, or where they are unable to deliver the milk in good condition, but have it returned from the factory, they are always inclined to brood over these difficulties to themselves, not feeling free to consult with their more successful neighbor, as to how they can get out into the light.

The ideal principle of co-operation in this particular, will not be accomplished until all the dairymen in any community, patronizing any particular factory, will consider themselves bound by the golden cord of good fellowship, and as all of one family, will feel free to impart both their difficulties and their successes to one another, with the object of attaining the best results.

The second link in the chain, that of manufacturing milk into cheese, is one of much importance, and upon which much depends. We must admit that there has been a good deal of successful co-operation upon the part of the manufacturers of both cheese and butter, especially cheese, in the development of this great industry upon the American continent. Holding public meetings by dairymen, contributing of their funds for the employment of instructors, and the distributing of literature, as well as in many other ways by the cheesemakers is indeed the true spirit of co-operation, and these have brought their reward, but there are some other directions in which I observe that the makers are not so free to co-operate. It is particularly true of those that are not prosperous and who are not doing a remunerative business, that they are unwilling to come out into the light and consult their neighbors with the object of improving their goods, and getting better returns.

I think it is undoubtedly true that cheap men, badly built and poorly equipped factories, and dirt in some of our factories, are the greatest bugbears to the progress of the dairy business. Men who will allow themselves to run these poor factories, as a rule, slouch around, keeping themselves very untidily, and seem to be content with the poorest kind of results. They do not realize that to improve the conditions of this small percentage of factories, and the product that comes from them so as to bring them up to the standard of the best, would be the means of enabling all factories to obtain a better price for the whole product of American cheese.

Another point in which manufacturers or makers exhibit a spirit of rivalry and jealousy and which is probably the weakest point in our whole co-operative system, is that they will not protect one another in the matter of receiving only first class milk. In too many localities, it is a common practice, that if a patron's milk is returned from the cheese factory, or if he takes offence at some slight provocation, that the neighboring factory is willing to receive his milk with open arms, and as a consequence of this spirit of rivalry and weakness, patrons are never properly educated as to what their milk should be, and a considerable quantity of milk is received at the factory, which is injurious to the general product, and should be returned to the farm

I am pleased to be able to report to you that through the efforts of the instructors in Ontario, some advancement has been made in this particular feature, and the makers, in several groups have banded themselves together to protect one another upon this point and have pledged themselves not to receive milk from a patron who has left another factory during the season on account of his milk being returned. I believe that an understanding of this kind will work out in the true interest of all concerned, and be the means of getting better milk to our facories.

Then, in the matter of selling the cheese, I notice that there is also too much rivalry and jealousy existing between factorymen and makers, and the great strife is, to make it appear to their patrons to have received a little bigger price than their neighbor. Various schemes are resorted to by salesmen in order to make it appear that the price received at their particular factory was higher than that of their neighboring factories, such as holding of the cheese longer than they should do; the peddling of the offer of one buyer to secure a better offer from

another; and even the manipulation of figures in making the accounts; are in some cases creeping in. These methods are all unwise, and will in most cases, in the end, prove ruinous to the factories adoping them. Better co-operation on the part of the salesmen and the adoption of methods whereby the cheese may be sold weekly or fortnightly, in the best possible market, and sold regularly, will be found in the end to bring the best results.

The most cordial feelings of good fellowship should always exist between every cheesemaker and his patron, and this feeling should be cultivated by both. The cheesemaker should be the best informed person in the neighborhood upon all questions pertaining to his business, keeping of cows, caring for milk and so on, and the patron should be willing to consult with him upon these subjects and not ready to take offence at the slightest provocation, in the way of fault being found with the milk sent to the factory. On the other hand cheesemakers should welcome their patrons to the factory, and be willing to receive suggestions from them and even criticism as to how the work being done in that particular factory impresses them from their standpoint.

The third link in our chain, is that pertaining to the buyer. It may be assumed that in most cases, the buyer is the best judge of what is required in quality of cheese and butter and hearty co-operation between the makers and the buyer, as to the means of obtaining the best results and as to quality of cheese required in the market in which the cheese are to be offered for consumption, will be sure to obtain the best results.

Men who are sent out to inspect cheese and when they find the quality not right, reject them with a curse, as a rule, have not sufficient knowledge themselves to suggest a remedy to the maker, and such men are a great weakness to the industry. Let us strive to sell our cheese to buyers who do their business honorably and thoroughly understand what is required, and then we may invite their co-operation in our effort to produce the finest quality of cheese.

Fourth, the question of transportation of cheese to market is one in which too great care cannot be exercised, that the goods turned out may reach the consumer in as good condition as when they left the factory. It is a mistake to conclude that the interest of the farmer and manufacturer ceases whenever the cheese leave the factory and they receive the price. It does not cease in the true sense until the cheese

turned out reaches the consumer and if the product of any particular factory does not reach the consumer in satisfactory condition the factory reputation is likely to suffer as a consequence.

Clean wagon boxes with covers to protect the cheese from the rays of the sun and dust on the road to the station are necessary where cheese has to be drawn any distance, and clean, cool railway cars are an essential to carry them to their destination.

In the fifth link of this chain, that of the consumer, we find the test of the situation so far as what the quality of the cheese may be. In these modern times, with so many varieties of food, a man or woman will not buy cheese for their tables unless it suits their taste. It is therefore of the utmost importance that the consumer's taste, in all cases, be most judiciously studied and complied with, in order to produce an article of food that will captivate his opinion of what a fine cheese should be. The consumer has a perfect right to say what he wants and what he will pay his money for, and it is only by offering him an article that stands high in his individual estimation that will induce him to place it upon his table from week to week at remunerative prices to the producer. Neatness of style and package will also help us in this direction, and cheese being a delicate article, with so much depending upon flavor, its absolute cleanliness in the production is the only condition that any American or English consumer could entertain, and I would venture the opinion, that were many of the consumers of our high-priced cheese and butter to be allowed to get a peep into the conditions surrounding their manufacture in the small percentage of badly equipped factories, still running, it would materially effect the estimation in which they hold the product.

MILWAUKEE, Jan. 4, 1906.

Wisconsin Cheese Makers' Association,
In annual convention, 1906.

Gentlemen: The Citizens' Business League takes particular pleasure in extending to you at this time a cordial invitation to hold your next convention in Milwaukee.

We have noted with great satisfaction your continued growth in membership and the splendid character of your business programs. We are confident that your experience in meeting in Milwaukee has been profitable to your association from all standpoints and we beg to assure you, as in the past, that we shall be glad to welcome you and do all we can to make your stay here a very satisfactory one.

Wishing you continued prosperity, we remain,

Very truly yours,

CITIZENS' BUSINESS LEAGUE,

R. B. WATROUS,

Secretary.

After reading the letter of invitation, Secretary Baer said:

In behalf of the association, I wish to extend thanks to the Citizens' Business League for this invitation. It is of course gratifying to us to feel that we are appreciated here and that they desire to have us meet here in the future. Mr. Steinhoff will address a few remarks to the convention with reference to the cheese scoring.

Mr. Steinhoff: I just want to express my surprise and pleasure at the scoring of the cheese here, and to say that I met with a better quality than I anticipated. Of course I was aware that Wisconsin cheese was of a better quality than the Michigan cheese of which I had seen a small quantity. I also saw your cheese at the Pan-American, but in scoring the cheese here it ran more to our ideal of fine cheese than I had anticipated, especially in flavor; they were finer in flavor than I had expected to see. It is a great pleasure to have scored the cheese here and to have found them as fine as they were. Of course, you are not making as uniform cheese as Canada and it is not probably practical for you to do so. We aim at one idea in Canada and have worked to that aim for a good many years.

ELECTION OF OFFICERS.

Vice-president Michels was called to the chair.

The business before the house being the election of officers, nominations for president were called for.

On motion of Mr. Schwingel, duly seconded, Mr. E. L. Aderhold was nominated for president.

On motion of Mr. Joslyn, duly seconded, Mr. J. B. McCready was nominated.

No more nominations being made, the nominations were closed; Messrs. Austin and Knickerbocker were appointed by the chair to act as tellers, the ballots were distributed; on motion the ballot closed and the tellers announced the result of the vote to be as follows:

Total number of votes cast	217
For Mr. McCready	72
For Mr. Aderhold	144
For Mr. Michels	1
Total	217

Said motion being upon an informal ballot, it was further moved and seconded that the informal ballot be declared the formal ballot, which motion was unanimously carried, and Mr. Aderhold declared the duly elected president of the association for the coming year.

Mr. Aderhold being called to the chair, said:

Gentlemen of the Convention: I have but a few words to say. You know last year when I was elected it was without seeking the position, without any work of mine, it was kind of handed to me, not, it seemed to me, as though I ought to take it in the natural course of business. This year I said that I would take no active part in my own election, I hoped they would put up some good man, or men. I believe that these offices ought to be passed along, excepting, of course, the Secretary's office, we certainly ought not to make any change there. I took no part in this election. I thought if you wanted me you could elect me and I would take it, and if you did not it was all right, perfectly satisfactory to me. Of course it is gratifying to know that I still hold your confidence after a

year or two of this work. I am very grateful for that confidence, and I am going to try to do my best in this office in administering to the convention.

Nominations were called for the office of vice-president.

Mr. Caspar, duly seconded, nominated Mr. Michels to succeed himself. There being no more nominations, the nominations were closed.

On motion the secretary was instructed to cast the vote of the association for Mr. Michels as vice-president, which was done and Mr. Michels declared the duly elected vice-president of the association for the ensuing year.

Nominations for Secretary being called for, Mr. U. S. Baer was nominated; there being no further nominations the nominations were closed and on motion, duly seconded, the president was instructed to cast the vote of the association for Mr. U. S. Baer as secretary, which was done, and Mr. Baer declared the duly elected secretary of the association for the ensuing year.

Nominations for treasurer being called for, Mr. Fred Marty was duly nominated. There being no further nominations, the nominations were closed, and on motion of Mr. Carswell, duly seconded, the secretary was instructed to cast the vote of the association for Mr. Marty as treasurer; which was done, and Mr. Marty declared the duly elected treasurer of the association for the ensuing year.

Nominations for a director to succeed J. W. Cross for three years being called for, Mr. Cross was nominated to succeed himself. There being no further nominations, the nominations were closed, and on motion of Mr. Michels, the rules were suspended, and the secretary instructed to cast the ballot of the association for Mr. Cross, which was done, and Mr. J. W. Cross declared the duly elected director of the association for the ensuing three years.

Adjourned till 9 o'clock, next day.

FRIDAY MORNING SESSION.

January 5, 1906.

The president in the chair.

CHEESE PROBLEMS THAT CAN BE PROFITABLY INVESTIGATED.

PROF. C. A. DOANE, Washington, D. C.

Dairy Expert, U. S. Department of Agriculture.

In making a talk to you at this time what I have to say should not be in the nature of trying to explain to a body of cheesemakers the desirability or necessity for government interest along cheese lines. If there is anyone who should know this it is cheesemakers and cheese buyers. So I do not expect this talk to be in the nature of an excuse for my official existence. In this day when the department of agriculture is branching out and assisting as far as possible the men engaged in agricultural pursuits or callings related thereto, it is but right that the cheese industry should receive some attention and some help where it is possible to give it. Just what we hope to accomplish with your help is what I want to talk about.

Of course the making of better cheese, the treatment of naturally bad cheese so as to bring it to a higher standard or within the market requirements, in fact anything that will help to make the business more profitable or put it on a higher plane will be the lines along which we shall direct our efforts. On the other hand if any one is expecting us to help make consumers eat poorer or greener cheese than is forced on them at the present time, or expect us to furnish information as to how more water can be incorporated into cheese than is already done they will be disappointed.

And yet while we are advocating the making of better cheese and are giving our time, money and energies in this direction we realize fully how little incentive there is for cheesemakers to exert themselves to make a first class article. When every-

thing that would score above 80 on a fair test sells at full market price there is little reason for making a cheese that will score 95 or better. It takes extra work and milk to make good cheese. The present conditions in the cheese districts have forced the cheesemaker to look out for yield rather than quality for on this basis and this alone to a great extent will he succeed or fail in building up a good and profitable patronage.

But I do not think that there is a man here, no matter how much it may be to his interest financially to see this condition continue, but what will agree with me that it is entirely a false standard. And the question comes who can be blamed. The cheesemaker is certainly absolved. On one side he has a market that will accept poor stuff at full price. On the other is the milk producer clamoring for the highest yield possible. As far as we know at the present time high yield and quality do not walk hand in hand. The cheesemaker's success depends largely upon yield. How can he be expected to pay attention to quality. And yet the cheesemaker would undoubtedly be the one to encourage the making of better cheese were there no direct financial loss connected with it, for it is impossible to comprehend a body of intelligent American workmen who would not be glad to know that there was some sort of an award for superior skill and intelligence.

When we eliminate the cheesemaker from blame for the market conditions we have but two classes left, the consumer and the dealer. The consumers will undoubtedly claim that they eat the best they can get. The dealer will claim that as in every other line of business he furnishes as good as he is required to furnish for the money and no better. I am in sympathy with the consumer as I am placed in that class myself and I can truthfully say that it is impossible for those who appreciate good cheese to secure it with any regularity even in the larger cities without going to an extra amount of searching, consequently many who would eat cheese otherwise do not and those who do eat it largely go on the theory that it is poor cheese or none. In the last few years numbers of markets in various sections of the country have been built up on this class of cheese and the consumers have had little chance to find out that there is ever a better quality made. The fault, for it is a fault, is likely due primarily to the strenuous competition among buyers which leads to the acceptance of poor cheese from the maker, and the consequent necessity of selling it at a profit. No greater evidence of the future of the industry is needed than

the fact that markets have increased in the last two years even when the quality of the goods has been very low.

But in our department work you will realize the necessity of our working on the assumption that the consuming public may become educated as to taste and demand good cheese or none. Or that the dealers may experience a change of heart or die, and when that time comes we want to have a little information at hand that will be of some assistance in producing better cheese.

It will be the aim of the dairy division to make the work with cheese as helpful and practical as possible. Every cheese-maker who has made any study of the different details of manufacturing will agree with me that the effects of different processes are only in part known. Storage men will say that there are details along their line that light might be thrown on. In spite of the very poor quality of cheese which will be taken at full market price there is too large a proportion which falls below this standard. Anything that could be shown to reduce this loss would of course be of value. Even the best cheese-makers fall down occasionally and few there be who have not had to make up a cut in price out of their own pockets.

And now to be a little more specific as to our work. But first let us go over in more or less detail what we have already undertaken, remembering in the meanwhile that the cheese section of the division is only about seven months old, and we had lots to learn before launching out extensively. In connection with the Agricultural College of Connecticut we have three men trying to solve problems that stand in the way of our making some of the better known and most popular fancy cheeses of Europe. Several million dollars are sent annually to the dairymen of Europe for cheese that we are in hopes of learning how to make at home. Already one of the best has been made so successfully that at least one man is practically applying the knowledge gained from our men. Another kind, Roquefort, is being experimented with, and the work has advanced sufficiently already to give us every hope of successful imitation of this most famous of all cheeses.

At another place in Connecticut cheese manufactured at Plymouth, Wis., is being fed to a lot of college students to determine its value comparatively and absolutely as food at different stages of ripening. This work is being duplicated as far as possible by chemical means at the bureau of chemistry of the department. All of this work has proceeded far enough to in-

sure some very interesting results. In your own state of Wisconsin, the division has stored $1,500 worth of cheese to determine the age best suited for putting cheese into cold storage and the best temperature for this purpose. We have also made some tests to see how near the hoop cheese can be successfully paraffined. In addition the effect of varying quantities of rennet has been tried. Of course all cheese men could tell me the result of the last, but unfortunately the results have not been exactly what might have been expected up to date.

In the meanwhile we have looked ahead to determine roughly what we shall do in the immediate future. I will give you in more or less detail what this is to be. Of course the work with the foreign cheese already started will be continued, first until a successful imitation of Roquefort is made and then with other kinds already imported into this country in considerable quantities or that we think might become popular if once our people became acquainted with them. This means work for several years. No work or very little work with these varieties has ever been done even in their own countries. They were the products of chance in the first place and have been made by rule largely since then. They may or may not be capable of improvement, but the chances justify the effort.

Next in order is the Swiss cheese industry by name and origin a foreign cheese, though in a manner domestic and made extensively in this country. I say in a manner domestic for we have never as yet been able to make on an extended scale or with any degree of success a Swiss cheese that will take the place of the foreign product. As evidence of this statement observe the wide difference in price of the foreign and domestic and the fact that more than 12 million pounds are imported annually. There is a common belief that we can never hope to make as good cheese as the imported Swiss. But the New York importers assure me that a small per cent of the domestic make is equal in every way to the imported and in fact is sold as imported. This being true it shows a good working probability. That per cent should be and can be increased until all the imported Swiss is supplanted by just as good cheese made in this country. There is a level duty on all cheese imported into this country of six cents per pound. This gives the American makers an enormous advantage over the importers.

But the domestic Swiss does not all sell as No. 1. Too great a proportion falls below the standard and sells at a big cut in price. Thank heaven here is one branch of the industry where

the cheese stands strictly on its merits. The proportion that sells at a lower price should be decreased by improved methods. Here is an industry that opens up the broadest field for investigation with hopes of improvement. The technical problems are numerous. The least adverse influences seem to make a second quality out of what promised to make a good cheese. Often these causes are not apparent and need to be studied. According to the inspectors of Wisconsin and New York there is great opportunity for educating the Swiss makers. This cheese appears to be the most difficult of all to make and on the other hand the scientific knowledge concerning it is comparatively small. It is very likely that the greatest opportunity for improvement in the cheese industry is with Swiss cheese. The importers say that the demand for this kind of cheese is growing with leaps and bounds. It can be made in this country and when made right will eventually sell for as much as the imported. The importers of New York are enthusiastic over the possibilities of this line of investigation.

Just what will be undertaken has not been determined. The troubles are deep-seated evidently and cannot be worked out in a short period. There appears to be a chance to accomplish something by securing some uniformity in curing rooms, for the curing rooms of the factories are as a rule bad.

When we take up the question of American or cheddar cheese I am on a little more familiar ground, and feel a little more assurance when I commence to go into details. And while I am likely to stir up comment and opposition by my statements I feel that they are borne out by facts and that I can successfully maintain them. There is no branch of the industry which has a larger number of intelligent men working at it than is the case with our common type of cheese. There is no hope of producing a better cheese than is often made at the present time. But you will all agree with me that in general we haven't arrived at perfection and though we face the fact that the market does not demand, and will not pay for a better cheese, taking away all incentive for making a better cheese, let us consider as far as we know the effects of the different process involved in the manufacture of a common cheese. But first it might be interesting to enumerate what is actually known of cause and effect in this process.

First we know that cooking a curd expels the whey and we think we know but we do not very definitely that the higher the cook the faster the whey is expelled and the curd firms up.

Second we know that if a curd is left in the whey until too much acid develops we will have or the buyer will have if he buys it too green, a dead sour cheese. Third we think we know that the development of acid in the curd and whey checks the tendency to a gassy curd. This is one of the things that has not been worked out in detail and so we only partly know it. It is added to the others to help made a good showing. Now we can go over the things we do not know. And for convenience we will commence with the first item in the making of a cheese and follow it through step by step. Barring consideration of the ripeness of the milk which will be considered under the general head of acidity the first step in the making of a cheese is the addition of rennet at a certain temperature. The temperature in general has been decided on as about 86 degrees. There is no good evidence to show that where milk was likely to work a little fast it would not be profitable and better to add the rennet at 95 degrees, for as far as we know at the present time acid will develop no faster at 96 than at 86. Moreover there is no reason definitely known why this higher temperature should have a bad effect on the cheese in other ways. As regards the amount of rennet 3 oz. to the 1,000 lbs. of milk is supposed to be about right. It has been figured out that this is a just proportion in averaging up cost of rennet and time wasted in awaiting for the milk to coagulate. But who knows the effect of varying quantities of rennet on the quality of the cheese. We do know more or less definitely that when rennet is used in large quantities it has a tendency to hurry the ripening of the cheese. It also makes it possible with high acid milk to hurry the curd out of the whey and high rennet is sometimes used for this purpose. But aside from the ripening what is known about the effect of extra rennet on the quality of the cheese? It has been said that it makes a poorer cheese. I have reason to doubt this statement seriously. It has been claimed that the use of less rennet results in a slight loss in the cheese solids and a possible less yield. It has also been claimed that setting the milk at a lower temperature than 86 results in a loss of cheese solids.

We have a certain standard of firmness for cutting the curd or at least each cheesemaker undoubtedly has his own standard. Who knows why the curd should not be cut a little firmer or softer or what the results would be if either course

were pursued. It seems to be known that by cutting the curd very soft there is a little loss of solids, but what would result from cutting the curd much firmer, or allowing it to stand for some time before cutting after it has arrived at the condition at which it is usually cut.

And now as to the matter of cooking. The old so-called authorities told us or may tell us yet in some cases that the cooking should be very slow at first while the curd was stirred with very gentle motion using the hands exclusively. The speed of heating was gradually increased until a full head of steam was turned under the vat and finally the cooking was brought to a close at from about 96 to 98. Now it is a well known fact that many good cheesemakers of the present time turn on a full head of steam at the start and they are not as gentle in stirring as they were once. The old theory was that fast cooking hardened the surface of the curd particles to such an extent that the whey could not escape. It was a good theory but to this day the fact has not been demonstrated and the chances are that it can not be. Moreover why should not curd be cooked to a higher heat than is customary? Why not 110 or 105 degrees instead of the customary heat? Who knows the probable bad effect if in fact there would be any bad effect. There are several things that might be influenced favorably or otherwise by the high cooking and it is worth trying at least.

When the curd has reached a proper degree of firmness and the whey a proper per cent of acid the whey is drawn. This question of firmness involves the general question of moisture in cheese which is a very interesting one, and in view of the fact that quantity is everything and quality next to nothing with the cheesemakers it is a very live question. It is generally believed and with considerable reason that a firm cooked curd is necessarily a poor yielder, because there is some connection between the firmness of the curd and the amount of moisture contained. And on the other hand a soft cooked curd is a good yielder because of a big water content. These assumptions may or may not be right, and the fact is that they are often wrong. It is entirely possible and it often occurs that a firm cooked curd will hold enough surface moisture to make a heavy yield, while on the other hand a softer curd may leak out so much whey after putting on the rack as to give a very low yield. Again while it appears reasonable the firm-

ness of a pressed cheese may or may not be due entirely to the water content. Here is an interesting and a very live question that is worth looking after. In this general question of yield there is room for considerable investigation, and the influences that the various methods employed for increasing the yield have on the yield, and further on the quality of the cheese are interesting.

The question of acidity of the milk and whey at different periods of manufacture and the effect on the quality of the cheese is important. Certain theories, you may say that they are facts, have become firmly fixed in the minds of many good cheesemakers. It is believed that the quality of the cheese depends to a great extent upon the development of acid before going to press. To insure the right quantity of acid at this time it is necessary that there be a certain per cent of acid in the milk as shown by rennet test or acidimeter at the time the milk is set, and thus we find that the development of acid has to be watched as closely through the entire process as does the cooking. If there is too great a development of acid a sour cheese results. If there is not sufficient acid various evil results are believed to occur. Now the question is does the acid play as important role in cheesemaking as is ordinarily supposed? For instance it is believed that a certain per cent of acid is necessary to get the matted curd to break down and reach condition for milling. Who can say that if the milk was set much sweeter than common and worked up with less acid all the way through that the curd would not become mellow and velvety, and develop the grain as well as though it had the maximum acid. I believe that in my own work I have gone far enough to warrant the statement that whatever may be the effect of acid on the matted curd it is not as great as is ordinarily supposed. In other words the curd will mellow down as well with a small per cent of acid and almost as quickly as when a greater amount is developed. A good acid development is supposed to be necessary to secure a close cheese. This may be true partially, but it is not entirely so. That is, the acid may have some effect but it is not all. Again there was a common belief a few years ago, I do not know if it holds good at the present time that when a curd the whey was drawn comparatively sweet it was impossible to make a dead sour. In other words, dry acid could not harm the curd. This is partially true, but it is to be very much doubted if it is

always true. This general question of the effect of acid is important, as in the attempt to secure all the acid the cheese will stand even the best makers often let it go just a little too far. If it is true that the acid is not as important as has been supposed the cheese could be worked up sweeter all the way through.

The question of the closeness of the pressed cheese has been mentioned. Here is something that very little is known concerning. What makes the difference between a close and open cheese? Is it acid? Is it pressure? Is it firmness of the curd?

The list has grown long. I doubt not that many of you cheesemakers think some of the points brought up are trivial. In view of the fact that quality plays so little in the sale of cheese these questions commercially considered are in the main unimportant at the present time. But most cheesemakers will say they are interesting if not important. Many of you could tell me off hand the effect of some of the things mentioned but if we had time to take up these points and have them discussed by the makers present, it would not take long to demonstrate that they are far from settled. They will be taken up as time offers by the cheese force of the dairy division and the more important worked out. In the meanwhile the storage work at Plymouth will be continued if the manager hasn't become disheartened by government red tape. The problem set for the coming year being the effect of storage at different temperatures on cheese with various faults. We also want to try and see if storage nearer the hoop would not have a beneficial effect on some bad flavors. In the meanwhile we will try to find a simple method for determining when there is too much acid in a green cheese. The buying of greener cheese than is done at the present time would meet with serious opposition on the part of dealers because of the difficulty in telling when a green cheese is carrying too much acid.

There is a broad field for a bacteriologist in working out the cause and cure for many of the bad flavors. In addition the possibilities of pasteurizing milk for cheese has been studied but very little. There is a chance that it could be very successfully and profitably applied in the making of some kinds of cheese and to common cheese during the season when there is likely to be gassy curds.

The list has grown rather long. There are other things to

add and those already mentioned could be enlarged upon, but you can see that there is plenty for us to do.

DISCUSSION.

The Chairman: We are very glad that the Department of Agriculture is giving us some of its attention and making investigations along these lines which will help us in the future. Mr. Doane has covered a very big field, almost too big for us to attempt to enter in discussion. He has intimated that some of our popular theories may some day be exploded, but he has also advised you to keep right on with your methods until you learn better. I think he has made one statement which is a little dangerous without further comment, and that is with reference to stirring a newly cut curd vigorously. I think he made the statement that he had concluded from his own experience that it did not seem to make much difference with the yield. In my own experience in very many cases I have seen where that method wasted from two to four per cent of the yield of cheese. In his case, they used the agitator, in the case that I speak of they used a rake, and of course there is a difference. A vigorous stirring with the rake of a fresh cut curd certainly will create a big loss in the yield. I want to state further that nine cheesemakers out of ten would have a little thinner whey if they used the agitator instead of the rake.

Mr. R. B. Watrous at this point introduced the Arlington quartet, who sang several stirring pieces to the great enjoyment of their hearers.

THE NEEDS OF THE SWISS CHEESE INDUSTRY OF WISCONSIN.

CARL MARTY, Brodhead, Wis.

Mr. President, Ladies and Gentlemen: The needs of our great Swiss cheese industry are many and I shall try and point them out as close as my observations of many years have shown them to me.

Now, before our finished product, the cheese, reaches its destination, the consumers' table, many factors are joining hands in its production, and therefore the opportunities for wrongdoing are numerous and by no means confined to either one of them.

I will begin with the *milkbuyer,* and find that the spirit of comradeship is lacking with him; with the wholesale cheesedealer, who buys the milk of scores of factories as well as with the man who buys the milk of one factory and works same up himself. The different factories are changing hands altogether too much for the good of the industry as a whole. We Swiss have a proverb: "Viel Ruetsche macht d'Hose duer," in free translation, "Much sliding wears out the pants," and although it may sound "shocking" to some, it bears the golden kernel of truth. I have watched this "sliding" and the results are those pants above referred to, while on the other hand I found that those that stuck to their place for years are gathering the "moss" that the "rolling stone" will not. Now, it is not the milkbuyer alone who deserves all the scoring for these repeated changes—the patron also comes in for his share. A few more cents and cheap talk go good ways with him. Let him abide by the buyer that has treated him fair and square and he also will save patching and mending. He should not approve of the spite work so often exercised by the buyers and be a helping hand in it, unless he has just reasons. The drawbacks caused by these many changes are numerous and I will mention but the few most important ones. The cheesemaker, upon entering his new field of work, may have many good ideas of very necessary changes in the factory, but the execution of same are held back by the thought: "What's the use of going to all this trouble, for God alone knows if I can buy this milk again next year, or will be employed by the same buyer." The same thought reins him in regard to beautifying the surroundings of the factory. Further, there is not one like the other and inasmuch as the manufacture of a first class Swiss cheese requires more than mechanical procedure and knowledge, it will take the best of makers some time to get accustomed to the new conditions. No more that he has, he is forced to do so again in a new field. Further, new ideas, no matter how good they are, have a stony road ahead of them and when it comes to unloosen the purse strings of the patron for crying improvements it involves many a time a change of either buyer or maker, or both. Hence, I think that the recent scoring of our Swiss cheese-

makers by "Hoard's Dairyman", although it contains many good points is not fully justified. I wish to tell the "Dairyman" right here that we have scores of intelligent makers and not only a few, whose productions would induce him to take off his hat, would he take the pains to investigate the matter and see what a fancy lot of cheese most of them can produce in spite of all hindering and embarrassing conditions! But, certainly, the badly needed improvements are many and we all are working to get them.

Well, now comes the cheesemaker, and here we have the good ones referred to above and the bad. The object of my talk is not to praise the good in our industry, for it praises itself through its accomplishments, and is confined to the dark sides alone. The main reason why we have many poor makers is because the milk buyer and the co-operative farmer company do not draw the line close enough between the good and the poor. If a "hand" has worked one or two seasons at the trade—sometimes as many months—and proposes to work a little cheaper than the old experienced cheesemaker, not many questions are asked and he is hired. It would seem that this would probably be the case with the co-operative companies but not with the milk buyers, who themselves, as a rule, were cheesemakers in former years and know what the occupation requires. But strange as it may seem, this applies to them also. They know that the maker who employed the "hand" in question is a good man and think that his apprentice naturally must be of the same order. This illusion has been dearly paid for many times. What we need amongst the makers, as protection for the worthy ones as well as for the protection of the industry is, if not a union, strict rules governed by *common sense*. Each maker, before he gets control of a factory should have worked at the trade satisfactorily at least three successive seasons as "second hand" and should have attended one term of the state dairy school. The first for his practical training and the last for the scientific understanding of milk and its different tests. Isn't it strange, the learning of all other trades requires the adherence to certain rules and here our trade, by all appearances, is simply a trial ground for many. Let the would-be-cheesemaker be successful the first season and he thinks, he is "it" surely, although later years, when he runs up against the real thing will find him utterly lost. Why have we so many poor cheesemakers? Simply because they never received the proper training at the start and

now, after years, think they are too wise for such. Now, let me tell you that this will not change before milk buyers and co-operative companies will change their tactics and use common sense, instead of letting the greed that sees a few dollars immediately ahead get the best of them. Many and many a first class cheesemaker has left the field, simply because they were allowed to be crowded out by these deplorable conditions. It is you, you milk buyers and farmer companies, whom I blame firstly and the poor cheesemaker lastly. And you cheesemakers, you wise ones, who know everything and accomplish little, do not think you are too old and experienced. The bigger share of you do not even know of the appliance of the different milk tests, which are so helpful and absolutely necessary to meet all conditions. What's the matter with you anyway? But it's not all with them. Give them the proper chance. Those milk-testing courses, which our cheese factory inspector has inaugurated last spring at different points of our field have proven by their large attendances that many are willing, and I hope there will be a time when the rest are forced to be willing.

I will touch here upon a vital point in the life of our Swiss cheesemakers. There have been in late years comparatively many suicides amongst them and the question is asked, why? Now, I will give my version of it, knowing the circumstances well enough, as I went through the "mill," in this case cheese factory, myself, the first five years I was in this country. I remember well the thoughts that occupied my mind when I concluded after the fifth year to change my occupation. After looking over the past and penetrating the future I said to myself: "I'll be hanged if I work another year at this trade!" I admit things have changed to the better somewhat since then, but they are not to-day what they should be. In short, the life of a Swiss cheesemaker here, I should judge, compares about with solitary confinement in penitentiary. He has too much work crowded in a certain space of time and too long hours. From five o'clock in the morning until eleven and twelve at night steady, hard work is his lot, Sundays as well as other days; recreation there is none or very little. No wonder if a man's system, worked out like this, longs for an excessive stimulant once in a while, which cannot help but make matters worse. Let him be troubled with bad cheese besides and it will take but little to discourage him. On the other hand, if the season's work is over he has too much of that which he

lacked before—leisure time,—and is apt to "make up" for it. As a whole his situation is unbalanced and will naturally tend to unbalance the mind. Further many cheesemakers, who as a rule are young sturdy fellows, are single and have to "batch" it on top of all the other work, and then again the lonely situation of most of the factories, shut off from the outside world so to speak, is not apt to brighten his life. Let me say to the milk buyer: "Do not allow one man to do too much work; force him to have plenty of help and hence chance for recreation," and to the patron: "Cheer him up; visit him occasionally evenings, as a good neighbourly talk will do him good and make the long hours short."

Next comes the *patron,* and I find that with him many things will stand improving. To get good milk he must have good cows, which are well kept and looked after. Many a patron treats his cows as if they were hogs and is surprised if they do not yield as much as his neighbor's, who treats them as this gentle and above all useful animal deserves. Weeds and brushes of all denominations, shallow rotten water will not furnish the cow the material for sweet and wholesome milk, and yet a big share of the stock who furnish our factories with the milk are dependent upon these at some time of the season. And then, how are some of the cows kept in winter? Certainly not as they should be, and I would advise the guilty ones to put just a little less style in their new farm residences and a little more comfort in their stables.

The art of milking as a rule is considered as being on the level with "any old thing," say for instance—well, pumping water, and yet their are many points needed to stamp a man as a good milker. Too many children are allowed to attend to this important work and many of the chronic troubles of the cheese factory originate right here. A good experienced milker can soon tell if there is something wrong with the udder and milk and will not allow such milk to be delivered to the factory, but what can you expect of a child? Cleanliness is absolutely collateral to good success in the factory—everybody knows it—and yet you can notice cows being milked that have their udder covered with dirt, manily caused by the swamp-like condition of some of the barn yards. And the milk utensils, do they always get the proper care? Are they always properly washed with hot water and kept in proper places? Are they exclusively used for their purpose alone? I think not, or else the collection of things of all variations delivered

with the milk would not be so large as it is. It seems to me that it would be a step in the right direction if we would follow the example of the dairy farmers in Switzerland, who arrange a milking course every year, where the proper care of the cow and the milking is taught in all its important details. We certainly need something of the kind.

The *Cheese factory.* The term "cheese factory" sounds like something and I beg to substitute the term "cheese shanty," same being more in accord with the average appearance and condition of our Swiss cheese factories. I am ashamed of them and so are others. We have elegant farm residences and barns in abundance and cheese factories—oh my! And yet these very cheese shanties are the source of wealth that enabled the building of those other fine things. Any thing is good enough for our factories. The manufacture of good Swiss cheese demands at least three distinct and well built curing rooms. How many of our factories have them? Very few. How is it about the dwelling rooms? They are inadequate, especially in the older factories, where they consist of one and as high as two rooms, which may be sufficient for the single man but not for the man with a family. In Switzerland we have factories that cost as high as $50,000.00 and a cost of about $10,000.00 is a fair average for all. And they are built by farmers, who's life-path is by no means as easy as the one of our farmers. Our factories here cost from $600.00 to $3,000.00 and $1,000 is about a fair average for all. You Cheddar cheese makers are way ahead of us in this respect and I wish you would tell us what makes the builder of your factories put so much pride into them. Our farmers, when it comes to show off with their fine cows, fine horses, fine buggies. fine residences, etc., are not at all slow, but they don't take any stock in showing off with their cheese factory. Their saying is, "we made money with them as they are, what's the use of going to more expense?" And yet much more money is to be made out of them, if they are looked after as they should be. Better machinery, better curing rooms will certainly influence the quality of the product manufactured, and quality talks. Many a ¼c and ½c per pound is lost through our inadequate factories and these will figure up to a neat sum in a year for one factory alone The farmers may say, "what do we care? we sell our milk and get top market price for it just the same," and I will say, that this may work for a few years but not in the long run, unless you have a darn fool of a buyer who is anxious to loose his

money with you. For the buyer will not be in a position to abide by or raise the usual price if his returns are crippled through these circumstances. You farmers should think more of the goose that lays the golden egg. Reciprocation is badly needed here.

One great draw-back to our factories is the fact that the tools of same are owned by the milk buyer. This is entirely wrong and out of place. The farmers should own the tools as well as the factory, for the tearing up of things, caused by the frequent changes of buyers prevents many improvements. I do not look for the thorough and badly needed good factory with modern machineries before this system has been done away with entirely.

I am pleased to note the results of the cheese factory inspections since the enlargement of the dairy and food commission force and look forward to good returns. Let the good work go on, and to help same I would suggest that the state would empower the dairy and food commission to establish in the heart of the field of our Swiss cheese industry a model cheese factory, which, fitting all requirements and carefully adapted to our locality would prove to be a source of great benefit. A good example goes far.

The *Dealer.* He is the man who's actions govern the removal of many of the foregoing mentioned faults. He coins the money, so to speak, for the industry and his influence would stand for much, were it always in the right channel. Many and many are the faults with him, and I am tempted to close right here with the closing phrase of a sale bill—"too numerous to mention." But then, he too, is entitled to his share of the raking.

Combination brings strength and they could improve matters for themselves as well as for all concerned in this great industry if they would combine and do it in the right sense. We have a well established market for our product and yet the problem for the dealer to get fair returns for his labor and investment is growing harder year by year. Price cutting right and left by unscrupulous competitors reduces his profit to a margin that does not compare with the risks he takes, and competition again compels him to buy what we call "over the shelves," this is, accept an entire lot of cheese at one price without grading same. In order to see his way clear he does not dare to grade them too closely when shipping which certainly will not help

to improve his standing with the consumer. A strict grading of all the cheese is absolutely needed, and as long as this unnatural and crazy buying over the shelves exists we cannot look for penetrating improvements. It dampens the efforts of the maker and the efforts of everything else connected with the cheese factory, for, what's the use of troubling yourselves if everything goes at top price anyway! Further, our dealers lack proper ware houses and cold storages at their shipping points. Many and many a lot of cheese that has to go on to the market for lack of room at the factories and lack of proper ware houses at the shipping points could be greatly improved by further proper care and rehandling.

I will now close my fault findings. An expert who was sent over here not very long ago by the German government to investigate the United States, termed them the "land of unlimited possibilities," and I will extend this term to our great Swiss cheese industry, for in spite of all and everything we have accomplished much and the term "Wisconsin Swiss" you will find, is familiar in all the states and well regarded. The possibilities of our industry are indeed unlimited and I venture to say there will be a time when there is no need for the imported Swiss cheese here; but before that state of affairs is reached, many a thing will have to be different than it is now.

DISCUSSION.

The Chairman: This is one of the most practical papers that I ever heard at any convention, and the cheddar cheese makers can take home some of the good points with them, although it was not meant for them. What he said in regard to tthe lack of knowledge in milk testing in Swiss, brick and limburger cheese factories is unfortunately very true, there are very, very many of them who do not know how to test milk with the Babcock test, and there is no excuse for it. Now, the Switzers have a clear field for discussion of this subject.

Mr. Moore. I am not a Switzer, but what I have to say may apply equally well to some of the American cheesemakers and the Switzers. Last fall I went to the state fair and went around in the dairy building where the exhibit of adulterated food was. There we had samples of the dirt strained out of

milk; at least, I brought them there for exhibition, but Mr. Emery thought they were so bad that he didn't like to have me put them up. Many farmers are accustomed to bringing milk to the factory in cans where the covers are not quite tight enough to keep the milk from spilling and therefore they use a cloth to put over the milk in order to stop this spilling, and that is all right, if that cloth is clean and sweet, but any cheesemaker who permits his patrons to bring milk in cans of that character and allows them to use, as I have actually heard of, pieces of discarded underwear and things of like character for that purpose, ought to be hung, and yet such articles have actually been found by some of our inspectors used in that way. This fall, a year ago, Mr. Baer and Mr. Marty and myself took a little run in Green county amongst some of the Swiss cheese factories, and I want to tell you that the condition of things as described to you by Mr. Marty has not been overdrawn, indeed he touched it very lightly. There was one factory owned by a man who had grown immensely wealthy through his profits derived in the sale of limburger cheese, and I had to take an ax to chop a hole in the dirt to get down to the floor. This man had a draining table, where the cheese were allowed to stand and drain off, and the maggots on the board were simply a fright. The dairy and food commission has been censured for shutting up such factories as that. We didn't shut up that one, but we said to that man, "If you make cheese in this factory under these conditions, we will prosecute you," and so he shut it up, so we really reached the same end.

There is a great field for improvement in the Swiss cheese industry not only in the buildings, but in the methods of the making.

Mr. Carl Marty: We certainly do need improvements, but I don't want you to get the impression from Mr. Moore's remarks that we Swiss are dirty; that is entirely wrong. You would be surprised if you knew all about this to see how much conditions have been improved in spite of many disadvantages, but we need more improvements, don't you forget it. I have seen lots of the so-called imported cheese made right here in Wisconsin and we might make much more, but we have got to have the factories. I am ashamed to say we haven't got one in our whole field today that we can call a proper Swiss cheese factory, not one. Somebody has got to do the kicking about this, and I am doing it right here. We can accomplish much, very much, and if you will take the pains to look into it, you

must admit that we can, but there is a field for much improvement, and the quicker we can have that improvement the better. I hope our efforts and the efforts of this association will help to bring about some of these improvements. It is only about ten or eleven years since you American cheesemakers knew anything about this. When we were at Monroe, your chairman, in his paper, touched on this. I got the thing started and we got the establishment of the foreign department in the dairy school in Madison; that was the first step and we had to work hard for that, but ever since then we are getting improvements, slow but sure, step by step, and I hope within a short limit of time, say, for instance, ten or fifteen years, you will see great changes in the Swiss cheese industry. I see them coming; you cannot prevent them.

Mr. Fred Marty: I would like to contradict a few statements of Mr. Marty, although he is my brother. He has made the statement that we did not have one decent Swiss cheese factory in our section, and I say we have. We have a cheese factory of the valuation of $5,500, and it is far above any average factory in that community. However, we haven't the curing rooms which are desirable for the proper curing of Swiss cheese. But there are five or six manufacturers who have recently built in LaFayette county, buildings which are marked improvements over the old factories which Mr. Marty has not seen.

Mr. Carl Marty: That is the case, but you admit yourself that they do not have the necessary curing rooms.

Mr. Fred Marty: That is right; they haven't. Still I see a number of my men here, and I feel that I ought to give a few words to their credit. While working under the Dairyman's Association the last three years, the work that came under my supervision was so large that it did not permit me to take up any work beyond my jurisdiction; but since my appointment to the dairy and food commission, I have been able to go outside and inspect something like eighteen American cheese factories. Of course I do not know what conditions exist beyond those eighteen, but after an inspection of those eighteen cheese factories, I am sorry to say I have found only two clean operators and I found as much as 90 per cent of the utensils of the Swiss cheese factories in clean conditions, while the utensils in the American cheese factories, many of them, were in a filthy condition which would not be allowed at all in the manufacture of Swiss cheese. The problem that we are up against is much

more serious, perhaps, than in the manufacture of American cheese, because you have a certain control over your work; by using a certain per cent of acidity you may form certain gassy fermentations which tend to overcome objectionable flavors. In the manufacture of Swiss cheese, you take milk in an abnormal condition and it will undoubtedly be beyond the control of the maker. The best skilled maker may stand in front of his kettle with as little control of its contents as a child, because of the methods applying to the manufacture of that sweet curd cheese which is subject to fermentation, and that fermentation process goes on two months after the cheese is made. You have the advantage of us in the manufacture of American cheese, you have more scientific knowledge along your lines than we have.

Mr. Thoni: Mr. Marty has told us about all these troubles, but he hasn't told us what should be done to the farmer that brings the milk that makes the trouble.

Mr. Moore: It is much easier for the state to get after the Swiss cheesemakers than those who furnish milk to the factories, so the maker must do something for himself; the state can't do it all. So I say that any maker who takes milk from a patron which is covered with cloths in a filthy condition, anything the patron can pick up to cover it with, simply is derelict in his duty. This all means that the cheesemakers must stand together and turn these conditions down. They must work in unison and they must not depend on the state to do it all. They must educate the farmers to the knowledge of what lawful milk means, and the suggestion of Prof. Farrington yesterday that every factory put on its statements an extract of the laws governing this point would be very much along the line of helpfulness, and I think would do a great deal of good.

Mr. Thoni: We would like to ask Mr. Marty to explain how those ideal curing rooms could be arranged in a model Swiss cheese factory.

Mr. Carl Marty: As a rule, we have three curing rooms, one where the cheese is taken first, where it goes during the salting process; one to open up the cheese; what we call in Swiss "speher," and that is a room at a high temperature, to start the gassy fermentation. With some cheese it is not necessary to use that curing room, and with some it is very necessary. You want at least three, and even four curing rooms is better. You can make a morning's cheese and it works altogether different than an evening's cheese does, the fermenta-

tion is different. Now in most of our localities, we are compelled to put those two cheese in the same room and the cheesemaker knows that this morning's cheese ought to have a different place with a different temperature, but he hasn't it, so the simple fact is he is going to make a No. 1 and a No. 2 cheese, whereas, with the proper temperatures and surroundings he could have made two No. 1 cheese. This is nothing but shortsightedness, those who have the money do not dare to risk a couple of dollars to make a separate place because they do not actually see the money coming again, so he does the best he can.

Mr. Monrad: It may be interesting to tell you that Mr. Von Elbrecht here, who has visited Switzerland and who some years ago devised or constructed a Swiss cheese factory in Denmark, put in four curing rooms, and I think it is an absolute necessity in making Swiss cheese to have at least three. Mr. Von Elbrecht is right here in the audience, he is a representative of the government of Denmark, who is spending the winter here in Wisconsin with our conventions and at the dairy school, to see what he can see. Denmark is wide awake.

Mr. Thoni: I would like to ask Mr. Marty who he thinks is the most at fault that we have not got these curing rooms, the cheesemaker or the farmer?

Mr. Carl Marty: I put the entire blame onto the cheese dealer, and I will tell you why. The cheese dealer is the originator of the trouble. Of course, when I was first in this country there were not as many factories as now, just one here and there. When the farmers got ready to go into the dairy business and were looking around to see what style of factory they should put up, the cheese dealers, if they had had common sense, such as they would be expected to have, would have advised different factories altogether, but the standing rule was when a farmer company came to one of these cheese dealers and asked him, "Here now, tell us how to build a cheese factory," he knew there was competition going on, and he said to himself, "If I tell these farmers to make the cheese cheap, they will appreciate it, to get it out with the least cost." So they would point to the old poor factories, and tell them to make them like that, and perhaps a foot or two smaller, and so we have factories today which are a regular shame. If we only had a model cheese factory, not way outside in the country where nobody sees it, but right in the heart of our industry, not too expensive, by any means, but have it a common sense model cheese factory, a factory such as is needed for our purpose, and

set it right in the heart of our industry, it would be of great benefit, because parties building new factories would have a way to find out how it should be, and they could figure out very quickly and easily, or it could be figured out for them, and it would be a great benefit. This factory my brother speaks of may be a great improvement, but not quite what we need.

Mr. Fred Marty: This building of Mr. Bilcaler (?) would be a very complete factory in my estimation with one more curing room. That factory is five miles north and east of Monroe. Again I must disagree with my brother; he says the fault is all due to the buyers. I say, "No." The fault may have been due at one time to the buyers, but I have seen where the cheesemaker could have had everything to suit himself, even three different curing rooms with no more expenditure. I think we should blame ourselves that we do not get some of our leaders to make a plan of a cheese factory and distribute that everywhere, and I think it will be a great point if we shall undertake to get out a plan of a model Swiss cheese factory and send that out perhaps with the statements showing the expense and all. With such a plan, allowing for improvements all the way through, I think we would find that we need not find fault with the buyer.

Mr. Carl Marty: I did not mean to say that the cheese dealer is to blame entirely, but that he was the originator of it. If he had given a good example right at the start, things would be entirely different. Today one bad example is here, and it is followed by almost everybody.

The Chairman: I think it will be more profitable to discuss the improvement and not who is to blame. We have the conditions, and I am inclined to put a good deal of the blame on the milk producer. They are the ones that have to suffer for all these mistakes, either directly or indirectly, and they are the ones who could have any conditions they desire if they would only get together and get them.

Mr. Geering: Either in the Swiss cheese or the American cheese factory it is the best thing that the cheesemaker shall let the farmer know that he is losing by it, if it is his fault, and then I think the conditions will be changed.

The Chairman: Yes, it would help. I can see very hopeful signs for the Swiss cheese industry in the way of improving their factories. You know the first step in the way of improvement is to see our mistakes. They do see their mistakes, some

of them, they are awakening to know what is necessary, and so the future is very hopeful for them.

WISCONSIN CHEDDAR CHEESE FROM THE DEALER'S STANDPOINT.

MR. ROBERT JOHNSTON, St. Thomas, Ontario, Canada.

President Dairy Association of West Ontario.

Mr. President, Ladies and Gentlemen: It is a pleasure for me to come over to your convention. I do not say that it is a pleasure for me to address an audience. The question was asked by a teacher in one of the schools in England—"What was the form of capital punishment in the United States?" and the pupil answered, "Elocution." You will not be in any danger of being put out of this world by my eloquence.

I will say, as president of the Dairy Association of West Ontario, that when myself and our first vice-president came over here yesterday afternoon, and my friend was giving his address I was of the opinion that there were two Canadians here from what he said, but I came to the conclusion after one day's residence with you, without my protection, he would be turned into a very good American.

I have taken an interest for years in the work that you have been doing here, my brother being one of your presidents and in that way, by correspondence passing between us in regard to our work on each side, I have kept in touch and am glad to have come here for information. We are always glad to find out anything from you or anybody else that will improve the quality of our goods, and we are just as desirous to give you anything that we may discover that will make dollars and cents for you. We are called cousins across the border, but in regard to the dairy industry, I think we should be brothers.

Your secretary, Mr. Baer, having asked me to give an address this afternoon, I was at a loss what subject to speak on or a subject that I was familiar with and that would be of interest to you.

Now I thought I would say a few words to you on the quality of Wisconsin cheddars cheese from the dealers' standpoint.

Having handled a few thousand boxes of Wisconsin cheddar cheese this past season I may say that I am in a position to know something of the quality of your product in this particular class of cheese and as I am informed that all the classes of cheese, namely: large cheddars, twins and daisies are made practically on the same line. When I talk about cheddars it will embrace these particular line of goods.

Last spring having made a trip to the cheese c... York State and not being favorably impresse... of the cheese I found on the factory shelves, I turned to Wisconsin with the impression that I would find the quality of cheese that I wanted there. And I was not disappointed as in driving around to the different factories and examining the cheese in the different warehouses, I came to the conclusion that the makers of Wisconsin, in the section I visited, were alive to the fact that they had to manufacture fine cheese if they were going to get the price for their cheese that the market guaranteed.

I was told that I was not to be critical in passing judgment on the cheese that I would see. That I was not to judge them from an exporter's standpoint. But when I visited the factories and found fine cheese on the shelves which I did in many cases, my friends that were with me admitted they were the finest cheese for your trade. Also another thing I observed was that the finest cheese I saw was made in the best equipped and cleanest factories. And I will say that you can make as fine cheese in Wisconsin as I have seen anywhere in Canada, and that is admitting a great deal. But I will also say that your product is not as uniform as Canadian cheese. In making a remark of this kind to one of your dealers he said that they had markets where they could dispose of the poorer grades of cheese at a fair profit. Now this is not an advantage to the patrons of cheese factories as no dealers will pay the price for poor cheese that they will for finest. And it costs just as much to manufacture poor cheese as the finest. Your cheese as I have found them and mind you I am speaking of the finest class of goods as I do not buy any other, are fine in flavour, general make up good, not as close as our Canadian cheese though I had factories shipping that would compare with our best factories and what one maker can do another can try. The looseness I observed, was, I think, caused by putting too heavy pressure on after hooping the curd. Some few I found

with sweet or Swiss holes, which is due entirely to the maker salting his curds before sufficient acid has developed.

Coming to the fall make which should be the finest cheese of the season, I found that they were of the character of our fall goods in Canada 15 years ago. Where the factories were making fine full bodied cheese through the summer, I found the fall cheese pasty and of an indifferent character. Now as to the cause I could not say that I know, but I would suppose that insufficient cooking and the temperature of the making rooms were too low, also that the curing rooms were held at too low a temperature. Now that is only my opinion as I was not in the factories when these cheese were making. But I do know that under conditions of this kind we get the same ... goods in my country.

Now I would urge on the dairymen of Wisconsin that as they have the reputation of making the finest cheese in the United States that to keep that reputation they will have to keep moving forward; that reputation will not sell their goods if the quality is not finest. That they will have to have their factories equipped with the most modern machinery and utensils. That their buildings must be kept in a sanitary condition, and their curing rooms so that they can control the temperature. Also that the makers must thoroughly understand the science of making cheese.

I give an extract from the speech of A. Willard of New York State delivered before the first convention of dairymen held in Canada in the year 1867. He says in speaking of the cheesemakers of the New York state, "Some of our cheesemakers have fallen into the impression that they have reached the end of the art, and nothing more is to be learned. Many of them have signally failed this season and are now trying to discover the cause." He gives out this warning to the cheesemakers of Canada which is as true today as the day these words were spoken: "I warn you cheesemakers of Canada as I have our own dairymen that nothing is more prejudicial to success than the self-conceited opinion among men that nothing new may be learned. It paralyzes all effort for improvement. It has been the fault of the Cheshire dairymen of England, who have seen their prestige as cheesemakers fade away, and who are now beaten by the Somerset dairymen and by our American factories. It is the oldest cheese district in England, and has acquired great favor, upon which they rested, forgetting

that we live in an age of new ideas, when progress in every department of science is marching rapidly onward.

Now we live in an age of progress and I would say that the dairymen of Wisconsin should have no market for anything but the finest cheese. And if you make any other grade it is at the expense of either the patrons of your factories or the cheesemaker.

I think one of the reasons that the cheesemakers of Canada have to keep right up to the times is that we have only the one market, the most critical in the world, which demands a fine flavoured, meaty, full bodied cheese. And I have found that the best class of cheese that I had shipped this year from your state was cheese of this class.

I may say before I sit down that when in New York state, I found the makers all working for yield. That appeared to be the only object in view and wherever it was done, it was at the expense of quality. Now I hope that the cheesemakers of Wisconsin will not fall into this error, if they do then I will look for Wisconsin cheese to deteriorate in quality.

DISCUSSION.

Mr. Dassow: I have been troubled a good deal with Swiss holes. My curds are all right, but after a while Swiss holes develop.

Mr. Johnston: The acidimeter in our country is in general use. I made cheese for twenty-two years and I have made some with Swiss holes, and it was under certain conditions, I think, where we got milk that wasn't ripe. That class of goods is produced where we get bitter milk, that produces Swiss holes. I have found that in such cases when I put my curd to press too sweet there was not the development of acid, it was generally a low grade. The factory I made cheese in had nine or ten thousand pounds of milk and there would be always, maybe a small amount in one vat, and we would hurry it up and put it to press and if there was anything wrong with any of the cheese, it was that one.

Mr. Monrad: What degree of acid do you develop when you go to press?

Mr. Johnston: The general rule there is 1 to 1.2 per cent acid. They generally dip at .18, just according to the condi-

tions. A man can't take hold of a cheese factory and run it as he would run a lathe or another part or piece of machinery, he is working under different conditions every day. He must study those conditions. Also what will apply in one factory will not apply in another; what will apply in one section will not apply in another. In some sections you can develop more acid than in others without injuring your product. What will make a sour cheese in one section with the same quantity of acid developed will be all right in another, and that is where a man's judgment comes in. A cheesemaker should be a man of good judgment and study the conditions he works under from day to day, because there are no two days that he can work alike, nor does his milk come in in the same condition any two days. He wants to know under all conditions exactly where he is. That is one thing I would urge the cheesemakers of Wisconsin to make a study of, the acidimeter, learn how to use it. When the acidimeter was introduced in western Ontario, the boys hung it up, because, as they said, they didn't understand this thing. But I will guarantee to you that ninty-nine of the factories visited by our instructors are using acidimeters. They never salt a curd until it gets a nice, silky, velvety texture, such as it should have.

Prof. Doane: Mr. Johnston made one remark as to the probable cause of pasty cheese, cheese made late in the season. It may be that it gets into too cold storage. Of course, the general custom is to get cheese into very cold storage, 34 or 35 degrees, at about two weeks old. Now, the principal thing that I would like to get out for my own information rests upon an apparent fact, and there seems to be a divergence of opinion upon that question of cold storage in Canada. I understand the Commissioner is advocating the use of what they call the cool room, about 60 degrees, while Prof. Dean seems to be advocating very strongly the use of cold storage, as we understand it in this country, and this has caused some confusion. It has been advanced that perhaps they do not like to use cold storage in that country because we advocate it here.

Mr. Johnston: Oh, no. We have in our country a certain amount of rivalry between the different modes of development, and one fellow wants to work out his ideas, whether it is right or not. I believe in Mr. Ruddick's idea, that cheese should be cured fast and they are put in cold storage. I have put cheese into cold at 35 and held them there until spring and they were sent back as green cheese after six months.

Prof. Doane: That is the universal practice here.

Mr. Johnston: I will tell you another thing I have found in your cheese, and that is that your cheese gets bitter by storage, simply because you have too large an excess of moisture. I had a shipping of fall cheese sent to me and I happened to be in Detroit the day they arrived, and I went through them. They were shipped direct from the factory, they were maybe two weeks old. I put the trier into them and wrote to my agent and told him they were pasty cheese, not the quality I wanted, I wanted cheese to carry over until next summer. We do not sell anything but the finest goods and we could not sell cheese of that character to our customers. He wrote and told me that this would be all right, and I wrote and told him that it wouldn't, I was just that positive that I knew. This is simply a case of history when a man is trying to sell his cheese. It will ruin your reputation sure if you try to incorporate too much moisture in your cheese. Our experience in Canada has been that wherever we did it, it was a losing game. We used to have that idea. If you understand the thorough manufacture of fine cheese and carry it out, I don't think it takes but a very little more milk to make a pound of that finest cheese than it does a pound of the soggy stuff that is not fit for anybody to eat, and when the buyer comes into your factory and cuts you half a cent a pound and he is justified in doing it, some of you think he doesn't know what the value of that cheese is. In our country we don't want to handle second goods at all, and it is always an annoyance to the cheese buyer to go to the factory and find that kind. He wants to see the best you are doing, he wants you to keep on making that best kind, we don't want to cut any man; we know it often comes out of the pockets of the cheesemaker, and if not, it comes out of the pockets of the patrons. I would guarantee there are hundreds of thousands of dollars this year that should have gone into the pockets of the patrons that never went in there at all. I see by your statistics that your dairy interests sum up to $665,000,000. Now you take off a cent a pound from all the cheese that is manufactured in the United States of America, and what does it mean? It means an immense sum of money.

Mr. Dassow: Last fall I kept my curing room down to 40 and had no trouble with pasty cheese. This fall I put a steam pipe in my curing room and kept it to 56, and had all kinds of trouble with pasty cheese.

Mr. Johnston: I never made pasty cheese under those con-

ditions. In my early days we used to have pasty cheese, simply because we rushed the cooking; we developed too much acid to start with and cooked them up too quick and got them out and salted them and put them away and we thought the cold weather would hold them down, and we invariably had pasty cheese and we had to take off a cent or a half a cent a pound. I will guarantee I will take you into some of the factories in Canada, making January cheese or December cheese, and you will find the make-up just as fine as you will in September.

Mr. Dassow: I laid it to one cause; last fall I had some new milkers in. This fall it was all striper milk, just about ready to drop off.

Mr. Fred Marty: The conditions that this gentleman referred to are similar to the conditions that we found in our district in foreign cheese making. We have cheese that are firm and dry in the kettle while under the cooking process and we put them in the hoops and, under normal conditions one would think that those cheese were too firm entirely, but the results have shown that the cheese will run out and we cannot do anything with them. I have found by applying the curd test to such milk that there must be a lack of some salts or something in the milk that the rennet had not thoroughly acted upon the casein. You take stripper milk, old milk, and the rennet will never act on it as easily and thoroughly as it will on new milk. I think that was your trouble.

Mr. Deering: I made cheese a couple of years and I found out I used to make it pasty once in a while. I used to be bothered with sticky cheese, the kind these gentlemen are talking about, in the fall, and I laid it entirely to the cheese having worked too slowly. I didn't use a stater, and in the fall of the year when we made every day, the milk came in so sweet we set it right away, as quickly as we could, cooked it up, and it would then be seven or half past seven o'clock a. m. We would cook it up until we had a quarter of an inch of acid on the iron, if it was five o'clock in the evening. You could squeeze it up, it was like soap.

The Chairman: That is whey soap.

Mr. Deering: After I used a good starter and cooked it up. Of course now I cook it higher in the fall than in the summer, and I do not have a sticky cheese.

Mr. Berg: I would like to ask Mr. Dassow how long a time he took from cutting his curd to dipping, and how often he cut it.

Mr. Dassow: My time from setting to dipping is generally about two hours.

The Chairman: Did you use an agitator?

Mr. Dassow: Yes.

The Chairman: Did you us it last fall?

Mr. Dassow: No.

The Chairman: Well, you are working that too fast for a curd where you use an agitator, you are not getting a thorough cook unless you are working it dry on racks.

Mr. Dassow: There is no question but what that curd is dry when it goes onto the racks.

The Chairman: Did it appear springy? There was probably more moisture than you figured.

Mr. Dassow: It won't drain off any whey. It doesn't curdle up right and act as it should. It is kind of springy.

Prof. Doane: It seems to be taken for granted in this discussion that a pasty cheese is due to too much moisture. I rather believe from some experience we have had in our chemical work that you are falling into an error to think that is always the case. I have come to the conclusion that in some cases, perhaps not in all, we can have a very soft cheese that carries a very low per cent of moisture Of course the pasty condition might vary from that cause, too. We have had cheese carrying 30 per cent of moisture that was very soft, where, on the other hand, it would go up to 38, the cheese might be quite firm, so I do not believe that the moisture has as much effect on the texture of the cheese as to whether it is solid and firm or soft, as has been ordinarily supposed. That is the popular belief, I know, and they had grounds for the belief, and yet the facts do not bear it out as we found by experiment.

Mr. Dassow: The last day that I made cheese in the morning I asked the patrons about their cows, and every once in a while I would find one new milch cow and when I got it running that curd worked better. Some days before it took me till near midnight to get my curd in press.

The Chairman: It is a fact that most ferments will work more readily in the milk from fresh cows than the milk from cows long in lactation.

Mr. Berg: How long did it take the rennet to coagulate that milk from the time until the curd was cut?

Mr. Dassow: Twenty minutes.

The Chairman: Pretty ripe milk. How many days old was that milk?

Mr. Dassow: I made it from several days' milk. I have made it in one day, two days and four days, and the older I let the milk get the worse it was.

A Member: How high did you cook your curd when you had four per cent milk?

Mr. Dassow: I don't think there is a given rule for that. I cook my curd high enough in order to get it dry when the two hours are out. I generally cook at 102 to 104. If I had very ripe milk, I would go higher.

Mr. Steinhoff: I would like to make one remark in regard to the question under discussion. My experience would teach me that it all depends on what kind of moisture is left. If it is a sweet moisture, it may help to make a meaty cheese or a smooth cheese. It may be surplus moisture, and if it is an acid moisture, it would make a difference. I have made experiments for the purpose of determining that by dividing a curd and treating each part otherwise exactly the same; just at the dipping time dividing, starting one end and trying to make a meaty, smooth cheese and let the other one lie around and retain the moisture. You would think probably that the one cheese that has lain around would show the most meat in it, or softness. The opposite was the case. It lay there and the whey lay on top of it, and the whey became acid and that put acid in the curd, and it made a very undesirable kind of cheese, while the portion that was separated from it and got out of the whey was more as Mr. Doane describes, a softer, smoother, much more palatable article than the other.

Adjourned to 1:30 p. m.

AFTERNOON SESSION.

THE BENEFITS OF A THOROUGH SYSTEM OF INSTRUCTION IN THE MANUFACTURE OF CHEESE.

Hon. I. W. Steinhoff, Stratford, Canada.

Mr. President, ladies and gentlemen: I wish first to make a couple of corrections—first, in regard to the prefix to my name upon this program. I am not entitled to the title of "Honorable." The only Honorables that we have in Ontario are members of the provincial cabinet, and I am not a member of that body.

Another correction that I wish to make is, I noticed through part of this morning in the discussion that somebody said that I had said yesterday that I found the quality of the Wisconsin cheese superior to the Canadian. You that were here are aware that I did not make that statement. I did say that I found the quality of the cheese finer than I had expected especially in point of flavor, but I could not truthfully say that they were superior to Canadian cheese. It was a great pleasure to me to see the exhibit of as fine quality as it was, and I may say that in judging the cheese in company with Mr. Crosby, I took into consideration the market for which they were made. For the American market, or the Canadian market, if you take the home markets, demand a more meaty cheese, a little softer cheese—I do not mean by "soft" open or ragged, but they do demand a more meaty cheese, a little softer than we want for export. They have a long transportation to go to England, and are frequently held for some time, and we want a cheese with a little more body. Were I scoring that first prize cheese for export only, I probably would not have given it quite as high a score, but that cheese is a very fine cheese, it is a nice, attractive, flavored cheese. I frequently say that the quality I want in a cheese is such that when you eat a piece of it, get the first taste in your mouth, you want to eat more. Really what you want to please is the taste of the consumer. We

have established our market by consulting the taste of the consumer, going from England to Canada, studying the tastes of those English people, and letting them say what they want, and then try to please them, not acting upon our own notions of what fine cheese is, but to please the taste of the consumer, and of course to do that there are different points that have to be taken into consideration. You have to consider how far your market is away and the conditions under which you hold your cheese; how they have to be shipped and all that kind of thing, so that they will reach the consumer in the most desirable form in point of quality.

I would expect that your market here and your demands would be more varied. You see, in Canada, we have been working for years to one uniform quality and the approved system of instruction which we have to-day is helping us considerably along that line.

Now, I want to make a remark or two in answer to some remarks by Mr. Doane. I would rather he was here, but I am satisfied that Mr. Doane did not want to create the impression that we had nothing definite in our practice that would produce a certain result. I frankly acknowledge that his remarks created that impression with me, that you had been putting certain things in practice and you thought that you had certain results, but that some experiments would show that that was not definitely to be relied upon. I am sure that we have followed lines of practice in Canada and we have found out definitely that if we want to produce the right type of cheese, we must comply with certain requirements, we must do it. We cannot go slipshod and produce a uniform article of fine cheese, it can't be done. I think there are a good many points that are definitely settled in that respect, and I will say that if there is any experience which seems to not be as definite as we would like and the conclusions not as clear as may be practical, it is by the experiment stations themselves and I can easily understand that. Take, for instance, our Guelph school. They deal with a very small quantity of milk, two or three hundred pounds, in a little vat, and any of you cheesemakers know that the atmospheric influences are not the same upon a small quantity of curd as they are upon a vat full.

Now, we are trying to use the instructors that are on the road in the summer time and are dealing with conditions such as cheesemakers have to deal with, using them in the dairy schools in the winter time, and we find that it is more satisfac-

tory, because they know practically what you have to deal with during the summer season in larger quantities, and I think that explains probably the point that was mentioned by Mr. Doane as to the information that he tried to draw from the bulletins, which were issued by the different agricultural colleges or dairy schools and the Guelph bulletin would not give him the definite information that he was seeking after.

Now, as to the subject upon which I was to speak this afternoon, I have not prepared a paper, I thought probably it would be better to bring it out by questions and answers to a large extent, so that we might get closer together. We have found in Ontario this last two or three years that the most profitable meetings we hold for the cheesemakers are the small meetings that we hold during the fall just at the end of the season when your experience is bright and fresh upon your memories, and we get up close together and we have a nice warm discussion where everybody feels free to take part and to ask questions or criticise as he may see fit. We find these meetings, so far as practical results are concerned, about the most profitable.

The object of this system of instruction, as we have it now, with the larger number of instructors, was to try to improve the quality of our product. You know there is no place so dangerous as on a pinnacle, and from what has been said, both on this side and in Canada, and the kind of patting that we are doing of ourselves upon our backs, about the quality of our cheese, we might almost conclude that we had reached somewhere near perfection in the production of cheese in Canada. There is no such a thing as standing still in the history of an industry; you are either going ahead, makuing improvment, or you are sliding back, and with this object in view and taking up the question somewhat as I did yesterday, the Honorable John Dryden, who was ex-minister of agriculture in Ontario, sought to improve the cheese and butter products by reaching more effectively the producer of the milk and that is one object in appointing an increased number of instructors.

We have found by our experience that you cannot very well drive men; you cannot legislate to make men do what you want them to do in all cases, you had better lead them and the object is to syndicate the factories having twenty or twenty-five in each syndicate, putting an instructor on to visit that twenty or twenty-five, with the object of having sufficient time that he can visit more farmers, discuss with the farmers the difficulties of keeping the milk and caring for the cows, pastures and every-

thing pertaining to their end of it, and try to get the farming community to understand that we are not sending out detectives or even inspectors—we call them instructors. We want to give the impression that we are sending these men out to help them, rather than to condemn them. We find that sometimes in the past there has been great objection to seeing an inspector go into any particular farm plat and the farmer sometimes took offense feeling that it indicated that there was something wrong with that man's milk. We are trying to overcome that feeling; this last year the butter instructors rode out on the cream wagons in many cases and the cheese instructor rode out on the milk wagons and he called at nearly all the houses on the route so that no one could draw the conclusion that because he went into a certain house that there was something wrong with the milk in that particular place.

With this idea in view, about three years ago we started this system of syndicating factories in West Ontario, where there are about two hundred and seventeen factories. This last year we gave instruction to a hundred and seventy-one. There were nine instructors, including the cheese instructor, eight subordinate instructors, and then there was one chief that directed the work of all the subordinate instructors.

In Eastern Ontario, it was organized on the same lines, but there are a great many more factories in Eastern Ontario, consequently there are three times as many instructors as in Western Ontario.

These men are paid $800 a season and they pay their own expenses, which do not run very heavy, and they report weekly to the cheese instructor, and he to the department of agriculture, so that we have a complete record of all the work that is done by every instructor and we are able to make a comparison as to who is doing good work and who is not accomplishing so much. There is one point, one thing we believe we have learned, and that is, that it is necessary for a factory man to contribute to these funds in order to interest him in the work of the instructor, and as a consequence we have a fee that each factory pays, two dollars per visit, or, if they are syndicated, they pay $12 and the instructor visits them anywhere from three to five or seven times according to their requirements—some factories get off the track more often than others, you know.

Each instructor carries an acidimeter, and they do the testing of milk or for the purpose of discovering adulterated milk. If there are any prosecutions, the maker takes it up, and as a

result of this system of instruction we have a better quality in several different respects. We have, in the first place, better milk, both in flavor, keeping quality and cleanliness; we have better equipment .at the factories. As an example, in the Ingersoll group, the amount of money spent in improvements was $10,150; in the Woodstock group, $9,670, and so on down to one group which was started this year, the money spent was $1,350.

I have often said that cheese and butter are among the most delicate articles of human food and should be made in perfectly clean surroundings, and the person making them should be clean and attractive looking in appearance, and I am quite satisfied that if you were to bring customers that you may have for cheese and butter that very often you wouldn't dare to take them out to your factories, I know we wouldn't even in the Province of Ontario, where we have been hammering away at this thing a good while, but with this system of instruction there has been a more marked improvement than we have had under any other system, and much more improvement during the last two years than in any other two years. We get a more uniform quality; we get a better finish. Our Mr. Barr is very strong upon that point of finish, and it is important. We have had for a long time a large percentage of factories which have been finishing their cheese up very slouchily. There are still a few that are very slouchy and careless in the finishing up of their cheese, and I will say, as a buyer, we buy a good many cheese subject to future inspection on boards, and when you drive out to a factory to inspect cheese and upon arriving there you see probably a few flowers in the window, a nice lawn outside and no dirt or smell about the factories, and the maker meets you in a nice cleanly appearance, and things about look clean, I tell you you expect to find the cheese in sympathy with these surroundings, and you generally do find them all right. On the other hand, if there are bad smells and everything out of sorts, you are just expecting when you put your trier in the cheese, that those cheese will rank with the surroundings and you generally find it so. There is another improvement that is very noticeable, and that is in the starters. In the past, there have been quite a number of the boys using starters that were not pasteurized. They are now all pasteurized starters and consequently much better than they used to be. I made the remark to Mr. Crosby that I believed that nearly all the cheese here were made with pasteurized starters. It struck me as one

characteristic of the flavor, the flavor is not quite as juicy as I like, a little flat, not a quick, juicy flavor, but there is nothing objectionable, a very nice even flavor in most of the cheese.

Among other questions this last year, Mr. Barr, the chief instructor in Western Ontario, has been aiming to get information from which he could conclude whether we are making progress or not, and in order to do that this year he sent out a list of questions to the instructors, which they were to answer and send to him, and next year they will be asked again, so that we will be able from year to year to know whether we are making any advancement along these lines. I have here a copy of these questions. The first is,

"Do the makers wear aprons?" and then several others follow along the same line referring to the cleanliness practiced at the factories, both as to the makers' persons, wearing apparel and surroundings.

"Do they keep their clothes clean? Is there any effort made to keep the floors dry? Are the gutters kept clean? Are the utensils kept bright and clean? Is the curing room kept tidy? Is the curing room floor kept clean? Are the shelves in the curing room clean? How often are the shelves washed? Is the engine room tidy? Is the engine kept clean? How often are the whey tanks cleaned? Are there any bad flavors around the factory? If so, what is the cause? Are there any flowers kept in or around the factory? In your opinion, is this factory in a fit condition to receive a license?"

The license question is the question that is before us, as an association at the present time, and these questions will probably assist us in coming to a conclusion as to whether licensing will be wise or not. I have with me the replies from two different factories showing the variety that we find among the factories. In one of these, nearly all of the questions are answered by "No," and the conclusion is that the factory is not in a fit condition to receive a license unless some repairs are made and cleaning done, while, on the other one, it reads, "Do the makers wear aprons? Answer. Yes. Do they keep their clothes clean? Answer. Yes. Is there any effort made to keep the floors dry? Answer. Never wet. Are the gutters kept clean? Answer. Yes. Are the utensils kept bright and clean? Answer. Yes, very." And the conclusion is that this is the cleanest and most tidy factory in the group. We found a few years ago that we were troubled in some cases with the cheese getting mottled in the fall, and mottled cheese is nearly

always accompanied with a horrible flavor. It is a bacteria that gets into the cheese and the trouble comes from dirty curd sinks under the slats and dirty drains, so you see how important it is to keep everything clean. You can see what a pleasure it would be to an instructor to visit such a factory as that last one.

I will conclude by saying that it is always a great pleasure to have an interchange of men, particularly dairymen, between the United States and Canada. We always have one or two Americans at our conventions and our men come here more or less and I believe that there is benefit always to be derived from this interchange of knowledge and discussion, and I will venture the opinion that if there was a greater interchange, more meeting together of men across from one side to the other of this imaginary boundary line I believe that we would have a better understanding, and I go so far as to think that if there was an interchange of opinion and discussion, a better acquaintance in all lines of commerce, as well as in the dairy business, that it might be the means in future years to a large extent of breaking down this wall of the tariff protection. I believe that will only come about by a better understanding, a closer study of the advantages to be derived by the interchange of thought and the unity of effort. This being a co-operative business and a business requiring the very best co-operative talent, wherever we can get it, whether on your side or on ours, I am sure that we should profit by an interchange of effort in this way, and I know that we have derived benefit from men who have come from this side of the line, and that it would be a profit to ourselves to come out here to Wisconsin. A man must be rather dull if he cannot in a convention of this kind always pick up some information that is of profit to himself.

I most heartily wish the cheesemakers of Wisconsin great success this next year. You are on the royal road, I believe, to success, and all you need to do is to watch your course and to be diligent and to keep your high ideals always before you. Keep this aim before you, practice eternal vigilance and I believe that complete success will be yours.

DISCUSSION.

Mr. Monrad: What part of this expense is borne by the government?

Mr. Steinhoff: The government bears all the expense, except the fees that are contributed by the factories; that is about $12 per factory, and the instructors are paid direct by the department of agriculture. The appointments are made and the entire work is under the control of the dairyman's associations in Eastern and Western Ontario.

Mr. Monrad: Suppose I have a factory in that district and I don't want to join this thing?

Mr. Steinhoff: It is not compulsory; just moral persuasion. We hold a meeting in each group in the fall at the conclusion of the work, and at that time they generally pass a resolution if they want a continuation of the work. They also pass resolutions to stand together and protect one another upon the point of receiving milk that has been rejected at another factory. That is one of the weakest points that we have had in Canada, where there is rivalry between factories and a man gets a little offended because he is told that his milk is not right and he takes it to a neighboring factory and they take it in. You never can teach that man anything, because he is in too independent a position. A good many have bound themselves together to protect one another on that point, and if the matter is laid before the farmers in the right way, they can see that it isn't right. Of course, the men who are furnishing good milk have a very serious interest in the ability of another man to furnish one hundred pounds of milk to a factory that will contaminate the whole vat of five thousand pounds, and, consequently, damage the whole product.

Mr. Carswell: In our work through the state, we find that is the thing that causes more trouble than any other one thing. The makers are afraid to criticise their patrons for fear of losing them and they would rather put the responsibility upon the Dairy and Food Commission than criticise that patron themselves.

Mr. Steinhoff: Our government has always been very good in recognizing this dairy interest in Canada. Of course, it is an important industry, from the export standpoint the most important that there is in Canada, but even way back when it was not so important, they gave it assistance. They bear the

entire expense, with the exception of our membership fees in the association, which do not amount to more than $400 in Western Ontario, and then there is the factory fee that I spoke of. On the other point, I want to say I have always claimed that the maker should be the best informed person in the neighborhood in regard to his requirements, and the condition of the milk, and then his progressive farmers, the men who want to make the factory a success, the men whose cows are giving good returns, will all support him every time in sending home milk that is not right, because they all realize that it is unfair to take this milk in to damage the product as it certainly will. They will have more respect for you, gentlemen, if you are firm in this matter, do your duty in the right way. I do not know of any man who has been more successful along that line than Mr. Johnston. He always had the resolution to send home such milk, and I have known of more than one occasion where he had men come right back at him. A man natura... little sore if his milk goes home, but if a maker keeps at it long enough, and it becomes known, as it certainly will, among the drivers and dairymen, he will be supported and establish his position very soon and be respected for it.

Mr. Haskins: I think it quite often happens that we cheesemakers are unconscious that our factories are being neglected, or certain parts of our work. For instance, the hot water barrel in a factory that I was running—that barrel used to run over every day, and I suppose I let the water in the barrel without changing it, I didn't notice any difference in the color, and I didn't notice that it was getting very dirty. One day my wife came to the factory and she asked me how often I cleaned out that barrel. I said I didn't know, perhaps once in a week or two, and she says, "What would you think of me if I saved my dishwater and let it boil over every day and not make a change?" And that set me thinking. It is a good thing to have instructors around, they set us going right, and because all of you fellows are not blessed by having a wife to set you on your feet, you need the instructors.

Mr. Steinhoff: This gentleman has touched a very pertinent point. We call our Mr. Valentine one of the fathers of the cheese industry in Western Ontario, and his practice used to be, if a man wasn't doing very well, to send him out to look over somebody's else factory. A man gets to running in a rut and he is working hard every day late and early, and he gets used to these conditions and he does not realize just what his own

practice is until he goes out and sees the conditions in another factory. That is the benefit of the instructor going from one to another. He goes to another factory and he sees it is run in a slouchy way by a slouchy man and it strikes him as an outside experience. I believe a maker should have a better knowledge of what he has in his factory even than any buyer. During all the years I made cheese, I know I had a better idea of the value of my cheese than any buyer that came into the factory. I used to think that I could get the buyer that came into my factory to bore the cheese that I wanted him to bore, but now that I am buying I will say a man cannot get me to bore the cheese he wants me to bore, because I am onto that trick.

The Chairman: Our friend over here made a good point when he made it clear that a man should take pointers from his wife. I wish more of them would let their women folks do the criticising, and the washing, too.

Mr. Dassow: A few years ago we used to have instructors from the dairymen's association, but I haven't seen them around. How is that?

Mr. Carswell: A new man was put on and was at your factory, but you were not at home. There were some women folks there.

Mr. Dassow: Is that the reason he didn't come again?

The Chairman: Maybe he has not found out yet whether you are going to be away from home the next time. I want to say that Mr. Dassow is one of the most successful cheesemakers in Sheboygan county, and he has one of the cleanest factories in that county and he knows enough to bring his wife to the convention.

Mr. Carswell: In our work as inspectors traveling over the state, it is very annoying to go into a factory and not find a place where you can lay your hat or hang up your coat without laying a piece of paper down first, without getting everything covered with grease and dirt, and there have been a good many of such factories. I believe the gentleman is right when he says that many times the makers are unconscious, do not fully realize the condition of their factory as much as they would if they would get out and visit other factories.

WHEY DISPOSAL.

F. E. Carswell, Lone Rock, Wis.

Wisconsin State Cheese Factory Inspector.

Gentlemen and Brother Cheesemakers: I say brother cheesemakers because I was one of your charter members and it has been but a few years since I was one of your members in practice.

This question has been quite thoroughly discussed by the gentlemen who you have listened to, so I will be brief in my remarks and give you time to discuss this subject, which I consider one of vital importance to all cheesemakers.

There is an old adage, "The first shall be last and the last shall be first," which aptly applies to this question of whey disposal. When the first factories were built in this state, the tanks and receptacles that were used to hold the whey were the least and last thing thought of.

In the construction of factories, any old barrels, discarded tin or wood vats, or water tanks would do to hold the whey, and if there was not enough capacity to hold it all, why let it run over in the road or any place about the factory as it was nothing but hog feed and not worth much attention.

The question of cleanliness and purity of the product or the unsanitary conditions it might create around the building was not thought of. Now as the science of cheese making is revealing to the cheesemakers of the country that only by thorough cleanliness and proper care of all by-products of the factories, can cheesemakers hope to keep in the front ranks and at all times manufacture first class goods. The question of whey disposal becomes one, if not the most important, of the questions of the construction of our cheese factories.

In my travels over the state, I have seen a great many kinds of whey tanks and I am thoroughly convinced that the best form now in use is the elevated wood tank.

It should be made of cypress wood or southern pine, not over three feet in depth, with hoops that have lock nuts that can be tightened when need be, and of a diameter sufficient to hold the entire whey product. The tank should be placed in an elevated position either inside or outside of factory, inside being preferred and so placed that the hose or pipe that conveys the whey

to the farmers' cans can be turned into the sewer or drain. When the last farmer has taken his share of the whey, the pipe should be opened into the sewer or drain, and the tank can be quickly and thoroughly cleaned by the operator scrubbing the sides and bottom with a broom and hot water, the wash water passing away throug the sewer.

Where steam is used, it is best to elevate the whey with a steam or jet pump thus pasteurizing the whey at the time of removing it from the cheese vat.

This heating or pasteurizing the whey has many beneficial features. It makes the tank easier to clean, it destroys the lactic germs and prevents for a time souring or changing of the milk sugar to lactic acid, it destroys nearly all of the bacteria in the whey that gets into the milk from the time it is produced at the farm until it reaches the factory, it destroys the yeast germs that Dr. Russell has told you about and it is quite probable that it will not be many years until the legislature will pass laws requiring all by-products of the factories to be pasteurized in order to destroy any germs of tuberculosis that might be in the same.

Now, cheesemakers, has it ever occurred to you that the uncleanliness, filth and unhealthy conditions that may be found on some of your patrons' farms are being conveyed by the whey product to some farmer that is using every effort to keep his farm and dairy free from such plagues? You, as makers, are mixing one man's unclean, tainted, infected milk, with another man's clean, pure milk and you are then returning to each the mixed by-product without any effort on your part to protect your customers.

Further, do you stop to think that the old, rotten, leaky, underground whey tank, with an old pump, coated over with filth, that has not been cleaned for three months in hot weather, is a veritable pest house, that every square inch of its surface is teeming with millions of the worst forms of bacteria and disease germs. And you are requiring your patrons to convey the whey from these tanks back to their farms in the very cans you expect them to deliver good milk in. You would be horrified to see patrons clean out the barns and haul the same to the fields in their milk cans. But I have seen, while inspecting factories the past summer, old, sour, greasy, sticky, stinking, rotten whey poured into milk cans that put the cans in as filthy a condition and much harder to clean, than if they had been used for cleaning the barns.

Have you noticed that where new factories are started they have scarcely any trouble with tainted milk? It is the old dairy districts where the cry for help comes from, where the cleanliness of the whey tanks and surroundings have been neglected for years, where the ground around the factory has become saturated with pollution and has been carried through the whey to every farm in the neighborhood. And, until factory operators deliver clean whey to their patrons they are going to have trouble with their patrons bringing them tainted milk.

Don't think because you have an elevated tank and you pasteurize the whey that the tank doesn't need cleaning. Clean it every day. I have seen elevated tanks that were very filthy from lack of care.

Don't have your tank in a place where it is unhandy to clean or with a tight cover so it is difficult to get at. The simple, open shallow tank with large top surface is the best. Additional protection for cold weather can be provided by loose covers and an outer casing filled with straw or mineral wool.

I think it is a safe estimate to make when I say that in several of the counties I have visited this summer, the loss on the month of September cheese, to the farmers and owners, owing to the ferments and gas-forming bacteria that was in the whey carried back to the farms in the milk cans, was more than enough to put in first class whey tanks and sewerage systems in every factory in the county.

All the time this was going on, one maker was saying it was owing to the cows feeding on barley fields, another because the cows were getting too much white clover, another because there was too much dew on the feed, another because farmer Jones or Smith had a fresh milch cow, and as many reasons as there were factories were freely given. But they did not think to look into their whey vats where coated on the sides of the tank one-fourth to one-half inch thick was decomposing casein and butter fat teeming with millions of gas-forming bacteria so charged that a quantity the size of a half pea inoculated into a can of night's milk would spoil a 5,000 pound vat of milk the next day. Yet farmers and makers will argue that they can see no reason for keeping the whey tank clean as the whey is only used for pig feed and they think you cannot poison a hog.

I want to say a word about the practice of having farmers clean the whey tank. Every cheesemaker should be paid reasonable wages to do all the work that is to be done at the factory. He should be "boss of the premises" while they are un-

der his charge, and he should be held responsible for their cleanliness. If they are not in a condition that they can be kept clean he should require the owner to repair the factory and if not attended to, report the same to the proper authority. "What is everybodys' business is nobodys' business," and while you are waiting for some one of twenty farmers to come and clean the whey tank, it is foaming, fermenting and polluting the milk supply and causing you more work and trouble in a day than it would require to clean the tank every day for a week.

Also the loss to patrons and employer and the loss of your reputation as a cheesemaker together with your responsibility under the state law, are reasons why you as a maker should be the party to see that all whey tanks are kept clean.

Cheesemakers, there is no reasonable excuse why whey vats should not be kept just as clean as your milk vats. So that when you ask your patrons to bring clean milk to your factory that they can not say to you, "I know the milk is dirty, but it is much cleaner than the whey you are compelling me to put in my milk cans."

Remember the maxim "Cleanliness is the next thing to Godliness," the modern version of which is "Cleanliness is Godliness."

Use every power you possess to have in your factories clean, sweet smelling whey tanks and your efforts will be crowned with success in having better, cleaner milk, better cheese and better reputations.

In conclusion, let me ask you—How can you afford to neglect this important subject any longer?

DISCUSSION.

The Chairman: This whey problem has been very seriously neglected all over the state. I don't know that you will all agree with Mr. Carswell in his method of placing and cleaning the whey tank. I know in a great many cases we are not going to have elevated whey tanks yet, but let us discuss this subject thoroughly.

Mr. Dassow: Do I understand Mr. Carswell that he pumped his whey direct from the vats when you dip your curd?

Mr. Carswell: Yes.

Mr. Dassow: Don't you experience some trouble with the pumps or steam jets at that particular time?

Mr. Carswell: You can use more jets. You can't do it with one or two.

Mr. Dassow: I know there has been trouble in our neighboring factories where they said the steam jet did not work and there was no other way to get it out but over the floor.

Mr. Carswell: The man was not taking care of his machinery.

Mr. Dassow: You spoke of southern pine lumber or cypress. Is there any particular reason for using that?

Mr. Carswell: That lumber has some pitch in it and it will not soak up as much as some others.

Mr. Dassow: Just the day before I left I ordered lumber for a tank to be placed inside of a cement tank. I used that tank one year and I find it is coming out. It looks as if woodpeckers or grasshoppers had been in there, so I am trying to line it with wood, filled in behind with Portland cement. I am afraid I will have a little trouble with the wood shrinking.

Mr. Carswell: I have inquired about that of a good many of the farmers. I never used a cypress tank myself, but the makers, quite a number of them, have told me that they have the best success with a cypress wood tank. Some are putting in galvanized tanks, but it is claimed that the acid will soon dispose of the galvanizing, and they rust out very quickly.

Mr. Monrad: No good at all.

Mr. Steinhoff: There are some cement tanks in Ontario, and while they have had trouble in building them, and they haven't all stood, yet if they are properly made they will stand, and they will hold the whey. Most of those cement tanks are in the ground; I never saw an elevated tank made of cement.

The Chairman: Mr. Dassow has his in the basement, in the boiler room, just underneath his vats.

Mr. Dassow: The object of doing that was to get that whey down there quickly and keep it where it would not freeze, but it is peeling off, there is loose sand in it most every day on account of the cement being eaten off. When we made the cement, we put in brick sides, one brick four inches thick then put concrete in the bottom and then covered the whole with cement inside and outside. We finished it as good as we knew how and it had all of three months' drying, and I have lost faith in it, I can't get along with it this way on account of the sand getting into the pump.

Mr. Steinhoff: There are both whey tanks and floors made of cement, a good many of them now with us, cement floors in the making room and some in the curing room. They haven't all stood, they have been something of an experiment and there has been some trouble in factories with bad-flavored cheese where they had broken cement floors. If the tanks are rightly made and properly set, they will stand.

Mr. Marty: We have a cement box in our section dropped in the ground and they are answering the purpose very satisfactorily, the whey tank is one solid block of stone. It is finished as hard as the surface of the floor, smoothed off with a trowel. It is sand and cement, I think not quite half and half cement and sand; it is a little better than this for the floor, a little more cement than sand.

Mr. Steinhoff: The quality of the sand itself is important.

Mr. Carswell: The trouble I have found with underground tanks in this state is that they will not keep them clean. There is no way of draining them, and there is old whey left in the tank every day, and that spoils the whey for the next day.

Mr. Haskins: I have used an elevated whey tank; that is, the tank was up above the make room in one instance, and in another instance I had the tank out doors, but it was elevated. I had no trouble to get whey up there with a jet pump. I would like to know a little about this pasteurizing, would it be pasteurized by going through the jet pump?

Mr. Carswell: Anything above 135 destroys the germs.

The Chairman: It is usually a little short of that in jet pumps.

Mr. Haskins: I have used a galvanized tank for American cheese. It has been standing for about four years and seems to be in good condition yet.

Mr. Dassow: I put a floor in my basement, made exactly of the same material that my tank is made of, concrete with a cement floor on it, and that floor is perfect yet, just as smooth as the day we put it in.

The Chairman: You are satisfied it is the acid in the whey that is the trouble with the tank?

Mr. Dassow: I am perfectly satisfied. I have an idea if I had pasteurized that whey from the start, the tank would have lasted a good deal longer.

The Chairman: What proportion of sand and cement did you use in facing this tank?

Mr. Dassow: With the sand we have in our neighborhood,

we use one-third cement and two-thirds sand. I have read that in New Zealand they use half and half and I told the contractor about that and he said that their sand is different from our sand.

Mr. Carswell: The benefit of the elevated tank is that you can have a pipe leading to your sewer from that, and the operator or cheesemaker can drain the tank every day, and it is not more than five minutes' work with a broom and a pail of hot water to clean the tank, and if the managers will require that to be done, they can keep their tanks clean. The great fault with underground tanks is that they are not kept clean and a great deal of our trouble comes from this ferment that Dr. Russell told about yesterday and that comes from these dirty whey tanks. That is just where they found that particular organism.

Mr. Henry: What kind of cement did you use in making your cistern, Mr. Dassow?

Mr. Dassow: We had the best Portland cement that we could buy at the Falls. I have understood that there are certain grades that we cannot buy there. It is Lehigh Portland, the best I could get.

Mr. Henry: Any Portland cement is good, but the sand must be clean, and it must be smoothed down as smooth as glass.

Mr. Dassow: Now, about this idea of the taking of sewage from a whey tank. I have used sewers for draining whey tanks, and I found a lot of bother with them. I started in with a three-inch pipe and I believe I took it up three times during the season, and each time put in an inch bigger pipe, until I got it to eight inches, and even that wasn't enough.

Mr. Carswell: You didn't have a very good fall, perhaps.

Mr. Dassow: I had about as good as most of them do, I guess, about three inches on twenty feet, something like that. Now, I have the whey tank down cellar and I pump it out into cans and I make the farmers carry it off.

The Chairman: Mr. Carswell, your main object in having a tank elevated is to have an opportunity to drain it, as I understand.

Mr. Carswell: Yes, and to pasteurize the whey and make it easy to clean. It is also better for distributing the whey, easier for the farmer to get at it.

The Chairman: I know that in the eastern part of Wiscon-

sin, for many years to come, the most of the tanks will not be elevated, and I think we want to talk about the best method of handling the whey when they cannot or will not be elevated. When you run a three-inch spray from a vat and sometimes from two vats at the same time, I would not ask any cheesemaker to furnish a big enough boiler and enough jets to carry that whey as fast as it is coming from those vats; I never would advise anybody to try to do it in that way. I am not talking against the elevated tank, but I have found some that tried it and they have been bothered about drawing their whey as fast as it ought to go sometimes. In factories where they have considerable milk, I find that the whey should be run by gravity, if possible, so that there may not be any trouble. I don't care much whether they are elevated or right on top of the ground or partly in the ground, it is easy to get at them either way, and I am not a stickler for a shallow whey tank or some other things, but I am a stickler that there shall be a drain way from the bottom. If you can have a tank three feet deep and it is in the ground a foot or two, if you can get a drain out from the bottom into a sewer, I think that is a handy way to have it. Then another thing, the conductor that carries the whey from the vat to the tank is where lots of them make mistakes. They have conductors sometimes that come under the floor, they run it through the floor into this open conductor and that catches the main quantity. Some of it though, spills over and slops around, and stinks; there is a little every day, and that soil is soaked with old whey, and it will keep it stinking; besides this, generally the joints leak. Others have a tight conductor, gas pipes or galvanized iron pipes, or wooden conductors, and they are just as filthy as any old sewer can be. I don't say they cannot be kept clean, but I do say that they generally are not kept clean, and there is a pretty strong stench always liable to be coming into the room. There are gases forming in those pipes, and there is a tendency for the gases to rise upwards towards the building. Now, my idea, where you haven't an elevated tank, is to have them shallow, have it round in preference to square, to have it on top of the ground, if you can, or partly in the ground, but have it drain away from the bottom anyway, so that it can be easily cleaned every day without any loss of time and then to have an open whey conductor, to have the whey go through the wall. I would not have any kind of a hole through the floor, for whey or water or anything else; I would not give anything an oppor-

tunity to get into the soil under the floor. Run everything out through the wall, either in a tight gutter, an open gutter, through the floor, or an open trough standing on the floor which may be removed as desired. Now, that carries the whey through the wall. Then from the outside have another conductor that leads to the tank, an open conductor, and have it, if possible, a continuous conductor, not a number of them, because you have got to have more pitch with a number, and there is more chance for leaking. Make your trough continuous and so that it does not leak and make it big enough and then you can maintain nearly the same level and be all right. In that way the whey can be carried as rapidly as desired, there are no troughs that cannot be kept clean, and you can have your whey tank as high as possible under that system.

Mr. Carswell: You know, Mr. President, that in the eastern part of the state there are a good many factories built on very level land, and if they use the gravity system, the factory has to be on very high foundation, and they have to put the tank into the ground, even a shallow tank, three feet, and they have no way of getting any drainage from it. I know that you and I have both visited factories where we could smell the whey tanks before we got within fifteen or twenty rods of the factory, and it is a very hard matter to keep them clean, because there is no way of draining them. Another thing, in the eastern part of the state, they are using the self-heating vats a great deal, and that makes it difficult for them to elevate the whey. I have not recommended the use of elevated tanks where they are using the self-heating vat, because they have no way of elevating the whey, but they should be in some position so they can be drained and thoroughly cleaned daily. I think the inspectors must insist upon that.

Mr. Dassow: Don't you think it is better for that stuff to be hauled off than drained off? It has to come out in some way. All my other wash water goes over the ground five or six hundred feet from the factory and it makes no stench whatever, but with the whey going over there, it is something terrible..

Mr. Haskins: I would rather dispose of the whey myself than to have the farmers take it away in their cans.

Mr. Dassow: We have extra cans for that purpose.

Mr. Geary: Our president here came down and said if I didn't keep my tank clean I would be prosecuted. I wanted to have things right about my factory, but it was impossible

for me to clean it, and I told him so. Well, it ended in my getting a shallow tank and putting it in. It cost me considerable, but since I have had it done, I am thankful to Mr. [illegible] hold that he wanted to scare me, because it is very conve[illegible] now.

The Chairman: Mr. Geary was fortunate in th[illegible] an opportunity to get drainage. There was a ditch there and a creek near by. He had one of those cheap tanks and the whey was boiling from the gassy ferment. We insisted upon his spending a little money and making some changes and now he is glad that we scared him into it.

A Member: Will the square tank pass a sanitary inspection?

The Chairman: Certainly, if it is clean.

The Member: How would you make the conductor that enters into the sewer from the whey tank?

The Chairman: Well, that isn't particular. Some of them have the sewer come right up from underneath against the bottom of the tank and then have a hole through the bottom of the tank with a plug in it. That plug sticks up to the top of the tank so they can pull it without reaching down in there, and plug it up again. I was at a factory where at one side of the tank adjacent to it he had a sort of little well, you might say. He could get down in there or reach down in there and open the faucet and it would run from the faucet into a sewer that came up into this well. Do it any way, it doesn't matter. There are some factories that are so low down, right on the flat ground, that there isn't any pitch in any direction. Such a factory certainly ought to be raised up higher just for their own good. In some places they have to pump their whey out and haul it away. Then it is very essential that the whey tank be thoroughly emptied. This gentleman over here fixes one little box where it is lower than the rest of the bottom that everything will drain into. If the pump reaches inta that, you can clean it our perfectly clean. You want to use a big tile for your sewer, say five inches.

Mr. Dassow: Our trouble has been as to where the tile emptied. In dry weather in the summer, when we had very few rains, the ditch was clogged most always, or it would sink into the ground and make a terrible stench.

A Member: There are a great many ways to meet those problems of the clogging up of sewers. One is to devise a sort of a cesspool not larger than a common barrel and have that

under the ground, covered up, right at the entrance of the sewer next to the building. In your case, it would be next to the whey tank, and the settlings, anything that may come in the pipes, will settle in that cesspool. All the settlings would drop in there and that would be big enough to hold all the settlings for one season. Then take it in the fall when everything is frozen, uncover that and clean it out. With that arrangement, you will not know what the clogging up of the sewer is for all the season.

The Member: You want to use a trap, of course.

Mr. Carswell: It seems to me that it is the duty of the cheesemakers to see that this whey is taken away by the patrons that bring the milk, so that there should not be much left to run in the sewers. If the tank is washed daily, there is not going to be any clogging up of the sewers.

Mr. Deering: I have only a four-inch pipe, I have about two-foot fall on ninety feet. The hole in the bottom of my tank is two inches, and there is nothing that can get into the pipe that can't go through, because the hole in the bottom of the tank isn't big enough. Another thing is important, that there should be no elbows in that trough. I know that is the trouble in many cases.

The Chairman: How big are those tiles?

The Member: Four inches.

The Chairman: It is better to have them bigger than that.

Mr. Mulvey: I have had a four-inch tile in my factory about seven years. We do not run the whey through it, but all the washings and everything, and it never clogs. Of course the water off the building runs through it and it may be that helps to flush it.

Mr. Dassow: Has anybody had any experience pasteurizing or heating whey by the albumen curdling and making trouble?

Mr. Carswell: If it is heated to 150 or 155, or if you heat it before much lactic acid forms, it is all right. If your whey gets quite sour, it is more liable to curdle and throw down the albumen. Ordinarily, as you draw your whey, in ordinary cheddar cheese making from one-eighth to one-fourth inch acid, it will run off all right. I pasteurized whey all one season and my patrons were very much pleased with it. I pasteurized at 155 to 160.

Mr. Monrad: Was that with a check pump?

Mr. Carswell: Yes.

Mr. Monrad: Don't you dilute whey considerably with a check pump?

Mr. Carswell: Not very much.

Mr. Monrad: Ten per cent?

Mr. Carswell: No, I think not. As a usual thing in our country, even if it were diluted more than that, there was always plenty of demand, for we never had any trouble getting rid of it.

Mr. Marty: I have seen the time when I had to pump the water by hand to supply them.

Mr. Dassow: How about the butter fat on the whey, will that rise as readily, whether it is pasteurized or not?

Mr. Carswell: Yes, I think it rises as readily.

Mr. Dassow: It won't be apt to dry up on top and get lumpy?

Mr. Carswell: Not as much as it does in cold whey and the tank is much easier to clean. The hot whey keeps the butter fat more in solution, keeps it melted, and if there is anything left on the side of the tank one day, the next day the hot whey will melt that.

Mr. Dassow: And what will be the expense on the heating of that whey, say, with a steam pipe right into the whey tank?

Mr. Carswell: Well, I think the extra steam that is left on the boiler after doing your work will pasteurize your whey. Mine was not in an elevated tank when I pasteurized it. We just heated it with the steam left in the boiler. It was a surface tank.

A Member: How far from the factory would you like to have your whey tank?

Mr. Carswell: If you keep your tank clean, it might just as well be in the factory or close to it. If it is dirty and smells bad, the further away you can get it, the better.

Mr. Dassow: Where the farmers pump the whey themselves, don't you think they slop it a good deal?

Mr. Carswell: Well, yes, they do, and for that reason if you have your tank outside it is all the better.

A Member: I have my tank in the factory underneath the vats in the basement, with the whey pump inside the factory. There is a door on the north side of the factory where I have a little place partitioned off with a platform from the door. The farmers drive up there and pump their whey. I clean that as often as I clean my milk stand, and I have no trouble about the spilled whey. The only time they ever do spill any

is when they drop the spouts. If you show that you are aiming to keep that clean, the farmers will clean their feet before they go inside.

Mr. Carswell: Such a thing is an object lesson to the farmers and will make them more careful.

The Chairman: Is there anybody in the audience who has used a septic sewage tank?

Mr. Henry: There seems to be no answer. We have got the whey tank cleaned up. Now, I want to raise the next question about preventing the soil being permeated with whey near the tank where they fill the cans, and spill more or less. The same thing applies to the creameries where they take the skim milk, and I have seen places where it is in a horrible condition the week around. It is a breeding place for flies and I raise the question in order to remind you of a very simple way of getting over it, and that is to lay a cement foundation where they drive up to fill the cans and have a cement platform on the ground connected with the sewer so it can be rinsed off.

Mr. Dassow: I saw last fall a model factory that had a sidewalk of cement all the way round it, which was ten or twelve feet wide, and it was the nicest place I ever saw. The factory was built of stone and it was in beautiful shape. The place where they pump my whey we fixed up last fall and the patrons take particular pride in taking care of it, it is nicely graveled and was in just as good shape in the fall as when they put it there. I don't believe there has been a pailful of whey spilled there all summer.

The Chairman: What kind of whey pump do you use?

Mr. Dassow: I have a common, wooden pump with a five-inch cylinder.

Mr. Carswell: Did you have any trouble in keeping that pump clean?

Mr. Dassow: I didn't this summer, because I had to fix it so often it didn't get a chance to get dirty. If a pump is kept in good running order, it ought not to be dirty. Of course the inside of it will get a little filthy, but it won't be so bad as you would think.

Mr. Carswell: I have seen a great many of those pumps in whey tanks this summer and nearly all that I have seen had about a quarter to a half an inch thick of casein coating on them, and you all know that this is full of bacteria and gas germs, and if only a small amount of it is left in a farmer's can at night and he puts his milk in it, it will inoculate that can

of milk so that the next morning that one can will spoil a whole vat of milk, and make a gassy curd.

The Chairman: What is the best pump for measuring the whey to the patrons? It certainly ought to be measured.

A Member: That is one trouble—the cleaning of those weighing machines.

Mr. Carswell: A weighing machine is no harder to clean in the cheese factory than in the creamery. I will say the best pump you can get is one that is easy to clean.

Mr. Haskins: I think the elevated tank is the only good kind of a tank, because it can be run through the tank directly in front of the intake and this can be regulated by the cheesemaker you can have a hose on the pipe and that attached to an elbow.

Mr. Carswell: I have seen factories this summer arranged so that the maker had a gate by which he could control and measure every patron's whey as quick as he took in his milk, and it seemed to work very satisfactorily. That was with an elevated tank. He had a lever right at his hand, right near the intake.

A Member: You can't do that with a cistern in the ground.

Mr. Carswell: No, nor with a surface tank.

Mr. Noyes: I never saw an elevated tank, or any kind of a tank that the patrons operated, but what they spilled more or less and it became filthy around it. The only way I can see is to get it far enough off and fix the ground around it, making a foundation so it can be cleaned with some absorbent or something of that kind. The best way is to get it as clean as we can and fix it so we can operate it from the factory.

Mr. Carswell: I could take the gentleman to some factories in Dodge county, which I had the pleasure of visiting with our assistant commissioner, where everything about the whey tank was just as sweet and clean as the vat below. I wish Mr. Baer would say something in regard to that matter.

Mr. Baer: There are some factories in Dodge county that manufacture good cheese, and also some in Green county that manufacture Swiss cheese where Mr. Marty has been after them, some three or four years on this whey tank problem—you will remember that in Green county they have quite generally barrels in the ground, each patron has an individual barrel. Mr. Marty has been working down there to get those old barrels out of the ground, and get them to put in nice, clean whey tanks, setting outside of the factory, and there are some

of these factories and some of those whey tanks that are just as clean as Mr. Carswell says. That is true of quite a number of factories. I call your attention particularly to some of the Westphal line of factories in Dodge county. Their whey tanks are very clean and there are others beside them. I remember visiting a factory in Dodge county in company with Mr. Carswell, where there were wooden whey tanks on the floor above the milk tank that were just as clean and the whole room was just as clean as the room in which the cheese was made; in other words, they were both perfectly clean.

Mr. Marty: A great many difficulties have been overcome down there by putting in those whey tanks to be operated by the factory man, so that the whey is properly distributed, the cheesemaker works it himself. We have had four or five men here this afternoon who go outdoors themselves and give every farmer his share of whey and they keep things clean, too, and they like it after they have gotten rid of the old whey barrels.

Mr. Dassow: I see that A. E. Monroe, of Sheboygan Falls, is in the room, and he is one of the best mason contractors that we have. I would like to see him put a cement whey tank in his factory and try it for a year and report to us. I believe that he would see that it was made right.

The Chairman: Mr. Monroe, the president of this association would like to see you carry out that suggestion.

Mr. Monroe: I would use wood.

Mr. Carswell: The gentleman spoke about the fact that the farmers would not take care of these tanks, and I heartily agree with him on that. In some parts of Dodge county and in Washington county and several other counties they have got into the practice of having the farmers clean the whey tanks, and the result is they wait for this man or that man to clean it and the tank isn't cleaned at all. For that reason I say that it should be the duty of the cheesemaker to look after those things himself, and he should be paid a reasonable amount to do that work and all the work. This is a very important subject.

Mr. Noyes: I believe in a clean tank and I believe in heating the whey, I think I was the first man in Richland county that had the whey heated. I own a factory in Richland City, where they drew their whey out by pipes. There was a jet of hot water run through the pipe and it was cleaned out once a week and still where the patrons drew that whey, it was impossible to be always clean and sweet. It is a very particular

job. Whey tanks are all right if they are kept clean, but if you have a factory that has to be built strong enough to hold ten thousand pounds of whey, your tanks have to be put in just right to be safe. It is, as has been said, an important question. You ought to have a clean place to deliver your whey and keep the ground around it clean. I have sometimes thought it would be better to have it carried away and disposed of rather than delivered to the farmers at all.

Mr. Luchsinger: This question is one of those that will never be disposed of until we adopt some other way than what we have fallen into. Milk is one of the purest things that is produced by nature and yet the milk that is used sometimes in a cheese factory or a creamery is as different from pure milk as wine is from vinegar. We all know that if vinegar is put into a wine cask in a short time it makes that cask unfit for the storing of wine in the future. The same can should never be used for milk and the returned whey. The vessel in which it is returned is unfit to be used again and yet we go on doing that very thing year after year. Whey that is somewhat sour, will in a very short time, eat the tin off the inside of a can and then that can is spoiled, it is good for nothing except to carry sour whey in. I have seen a new can used in that way which in two weeks looked as though it had been used for years, it was discolored, rusted, so that no man with any sense would use it for carrying milk. This plan of carrying the whey back to the farm is doing more damage to the cheesemaker, to the farmer and to the reputation of the neighborhood and the injury of the whole state than the whey is worth. The milk condensing factories have the least trouble about their milk of any concerns that I know of. We have one in the city of Monroe that has been running a great many years and there is no trouble there, because they use up in the factory all of the milk contents, it either goes off in steam or goes into the condensed milk. When a patron has unloaded his milk they take his can and scald it and they forbid him to carry anything else in that can whether it is solid or fluid. They are very particular about it, and they have to be, because if they were not they would have as much trouble with their condensed milk as the cheesemakers and creamery men have with their cheese and butter. If you are going to stick to this plan of removal of the whey, I am sure it will be much better to have the whey tank a great deal farther away from the factory than we have had them heretofore. But then again, of course, that requires long lengths

of pipes, and they get in bad shape. The next best plan, it occurs to me, would be to have perhaps an open conductor some distance away, leading into a tank, and it seems to me that the farmers could adopt a plan by which the whey is fed right there—anything rather than to carry it home in their cans.

In Switzerland they have no such trouble, because instead of carrying the milk to the pasture, the cows are rented and are sent to mountain pastures, they are all collected there together, and the whey is fed right there to stock, and I think perhaps that is the cleanest way of disposing of it.

Mr. Marty: We cannot, of course, take into consideration the milk condensing factory methods. In the manufacture of our cheese, we have the whey on hand we have either to return it or do something else; but why can't we influence our patrons to get an extra can and keep it for the whey alone. They do that in a great many places and it works all right.

The report of the committee on resolutions was read by Mr. O. A. Kilsmiere and adopted as follows:

REPORT OF COMMITTEE ON RESOLUTIONS.

H. E. Austin, Chairman.

It is a fact well known to the members of this association that our state leads in the manufacture of cheese, both Foreign and American. The natural conditions existing are such as are not excelled by any other state. Our exhibit of cheese at this convention shows that our makers are taking advantage of these conditions, and it is hoped that they will continue to make the most of them.

Be it therefore resolved, That we extend our congratulations to those who have taken interest in exhibiting cheese at the county fairs, state fairs and conventions.

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 which has made this association the largest of its kind in the world, and this the splendid meeting that it is, and we heartily thank our Canadian friends, and those from our neighboring states who so kindly assisted in the addresses and discussions at this meeting.

Resolved, That we hereby tender our thanks to the supply firms who have so generously contributed to the premium fund.

Resolved, That it is the sense of this convention that the cheesemakers of Wisconsin would be greatly benefited by the holding of monthly scoring contests, and that we pledge ourselves to the support of such a contest.

Resolved, That we, the members of this association, are very much gratified with the success of the legislation secured at the last session of the legislature whereby the dairy and food commission was greatly enlarged.

Resolved, Further, that the campaign of inspection instituted by the commissioner, Honorable J. Q. Emery, and so well carried out by the able corps of instructors under him, and which has resulted in the inspection of every cheese factory, creamery and skimming station in the state for the first time, has accomplished all and more than was expected and amply justifies the increased force. The importance of this work in maintaining our pre-eminence as a leading dairy state can hardly be overestimated.

Resolved, That the work of the National Dairy Union, in its fight on oleomargarine, when sold in imitation of, or in the place of genuine butter, meets with our hearty approval, and we hereby pledge the support of this association to the officers of the National Dairy Union.

Resolved, That this association urge upon the Wisconsin delegation, in congress, the necessity of the defeat of the bill introduced by Mr. Grosovornor of Ohio, relating among items to the reduction of the tax upon oleomargarine when colored in imitation of butter.

Resolved, That this association, believing that much good could be accomplished if plans and specifications for model cheddar and Swiss cheese factories could be readily obtained, hereby request to have such plans made and distributed to those interested by the management of the dairy school.

Resolved, That this association is heartily in sympathy with the field work now being carried on by the dairy division of the department of agriculture, and in order that it may be carried on in a manner commensurate with the importance of the dairy industry, we hereby call on the members of congress from Wisconsin to use their utmost endeavors to place the dairy division on a financial footing, sufficiently large to carry on the work, and independent of any other division of this great department.

Resolved, That we extend thanks to the mayor and the Busi-

ness League of Madison, for their kind invitation for next year.

Resolved, That we tender our sincere thanks to the citizens of Milwaukee for their kind invitation, welcome and cordial reception, extended to this association, and thank the proprietors of the Republican House in particular for their generous treatment.

Respectfully submitted,

H. E. Austin, *Chairman,*
Boscobel, Wisconsin.
J. E. Ward,
Sandusky, Wisconsin.
O. A. Kielsmeier,
Manitowoc, Wisconsin.
F. P. Schwingel,
Avoca, Wisconsin.
Committee.

The Chairman: Now, in closing I want to admonish every cheesemaker to work with his fellowmen and try to increase the membership of this association between now and next year and get them down here to the convention, and if possible, to bring their wives and sweethearts along with them.

I want to say that Mr. Baer has worked very hard, he is still working day and night in keeping his promises to the association. He has worked all the year through with the railroad men and with others, he has worked over the scores and the medals and all the rest of these things and we are indebted to him.

Now, I want to extend the thanks of this association to some of those who came from long distances to help us, our friends from Canada, and of course Mr. Monrad, our god-father comes in for his share of the thanks. Miss Conley and Prof. Doane and Mr. Schilling also and I wish to thank the Experiment Station for sending us Profs. Farrington, and Russell and Meyers to help us.

I also wish to extend thanks to the members of the association for their courtesies extended to the president, all of which is most heartily appreciated.

Now, if there is nothing more, the convention stands adjourned sine die,—whatever that means.