Nineteenth annual meeting of the Wisconsin Cheese Makers' Association held in the Freie Gemeinde Hall, Milwaukee, Wisconsin, Wednesday, Thursday and Friday, January 11, 12 and 13, 1911. 1911

Wisconsin Cheese Makers' Association
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NINETEENTH ANNUAL MEETING

OF THE

WISCONSIN

Cheese Makers' Association

HELD IN THE

Freie Gemeinde Hall, Milwaukee, Wisconsin,
Wednesday, Thursday and Friday,
January 11, 12 and 13, 1911.

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. M. G. CARPENTER, Stenographic Reporter.

MADISON
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1911

LETTER OF TRANSMITTAL

Office of the Secretary,
Wisconsin Cheese Makers' Association,
Madison, Wis., 1911.

To His Excellency, Francis E. McGovern,
Governor of the State of Wisconsin:

I have the honor to submit the nineteenth 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 11–13, 1911.

Respectfully submitted,

U. S. BAER,
Secretary.

LIST OF OFFICERS, 1911

JOHN B. McCREADY, President.....Marshfield, Wis.
A. C. KOEHLER, Vice President.....Plymouth, Wis.
U. S. BAER, Secretary.....Madison, Wis.
P. W. WALLACE, Treasurer.....Hortonville, Wis.

DIRECTORS.

JACOB KARLEN, JR.....Monroe, Wis.
J. W. CROSS.....Mauston, Wis.
JOHN GROOTEMONT.....Brillion, Wis.

DAIRY JUDGES.

J. D. CANNON.....New London, Wis.
FRED MARTY.....Monroe, Wis.
A. J. BRUHN.....Madison, Wis.

DAIRY SUPERINTENDENT.

J. W. CROSS.....Mauston, Wis.

OFFICIAL REPORTER.

MRS. M. G. CARPENTER.....Saginaw, Mich.

OFFICIAL STENOGRAPHER.

MRS. ALMA B. ROUMP-FISH.....Madison, Wis.

OFFICIAL ORGAN.

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

ARTICLE V.

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

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

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

Section 4. The principal duties of the treasurer shall be to faithfully care for all moneys entrusted to his keeping, paying out the same only on receipt of an order signed by the president and countersigned by

the secretary. He shall file with the secretary of the association all bonds required by the articles of incorporation or the by-laws. He shall make at the annual meeting a detailed statement of the finances of the corporation. He must keep a regular book account, and his books shall be open 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.

MEMBERS WISCONSIN CHEESE MAKERS' ASSOCIATION, 1911.

Austin, H. E.	Boscobel	Wisconsin
Achermann, Jos.	Monroe	Wisconsin
Adams, C. R.	Wyoming	Wisconsin
Arndt, John	Cedar Grove	Wisconsin
Achtel, Chas.	Chilton, R. 3	Wisconsin
Albrecht, John	Kewaunee	Wisconsin
Anderson, H.	Chippewa Falls	Wisconsin
Andrea, Jacob	Monticello, R. 3	Wisconsin
Allen, F. J.	Chicago, 215 Jackson Blvd	Illinois
Alexander, C. B.	Chicago, 4 Sherman Street	Illinois
Asenbauer, M.	Theresa	Wisconsin
Anderegg, Casper	LaCrosse	Wisconsin
Aderhold, E. L.	Neenah	Wisconsin
Arnoldi, C. L.	Howard's Grove	Wisconsin
Bothwell, W. A.	Darlington	Wisconsin
Boeing, Emil	Dodgeville	Wisconsin
Boies, A. F.	Osceola	Wisconsin
Bruss, Robt.	Hixton, R. 2	Wisconsin
Beyer, Arnold	Greenwood, R. 2	Wisconsin
Buss, T. F.	Antigo, R. 2	Wisconsin
Brandt, August	Forestville	Wisconsin
Beutle, Leonard	Appleton	Wisconsin
Bollegene, John	Monroe	Wisconsin
Bahr, John	Blanchardville	Wisconsin
Boll, Ernst	Sheboygan, R. 2	Wisconsin
Barber, A. H.	Chicago	Illinois
Becker, Chas.	Milwaukee, 219 Germania Bldg.	Wisconsin
Bahr, Chas.	New Holstein, R. 3	Wisconsin
Bettner, A. A.	Random Lake, R. 17	Wisconsin
Bunke, Paul F.	Milwaukee, 84 Detroit St.	Wisconsin
Bremmer, Chas.	Plain	Wisconsin
Baertschi, Fred	Mayville	Wisconsin
Bunter E. B.	Watertown	Wisconsin
Beneshek, Anton	Maribel	Wisconsin
Brewer, U. S.	Richland Center	Wisconsin
Bender, Fred	Boaz	Wisconsin
Behnke, R. C.	Brillion, R. 3	Wisconsin
Burt, G. E.	Plymouth	Wisconsin
Boehm, Richard	Curtis	Wisconsin
Birdd, James	Yuba, R. 1	Wisconsin
Burrell, Loomis	Little Falls	New York
Burrell, E. J.	Little Falls	New York

Bierbaum, H.	Plymouth	Wisconsin
Buchen, Geo. J.	Plymouth	Wisconsin
Bennin, W. F.	Chilton, R. 1	Wisconsin
Brinkman, M. L.	Sheboygan	Wisconsin
Barlen, John	Spring Green	Wisconsin
Biddulph, J. R.	Tiskilua	Illinois
Bartell, Leo.	Weyauwega	Wisconsin
Bruhn, A. T.	Madison	Wisconsin
Bamford, H. J.	Plymouth	Wisconsin
Cook, Hon. S. A.	Neenah	Wisconsin
Cannon, John D.	New London	Wisconsin
Cammers, Wm. J.	Unity	Wisconsin
Chaplin, E. W.	Plymouth	Wisconsin
Cannon, S. D.	Neenah	Wisconsin
Caroer, C. A.	Milwaukee	Wisconsin
Chaplin, H. C.	Plymouth	Wisconsin
Cornish, O. B.	Ft. Atkinson	Wisconsin
Cisar, Ben.	Oconto	Wisconsin
Cross, J. W.	Maustin	Wisconsin
Doperalski, Victor	Kewaunee, R. 5	Wisconsin
Damrow, E. C.	Fond du Lac	Wisconsin
Dornstreich, Ewald	Greenleaf, R. 3	Wisconsin
Damrow, O. A.	Sheboygan Falls, R. 7	Wisconsin
DeHaan, Math.	Lineville	Iowa.
Dillon, Henry	Boaz	Wisconsin
Dufner, S. J.	Waukesha, 110 College Ave.	Wisconsin
Dirks, Emil.	Kiel, R. 1	Wisconsin
Dean, D. W.	Appleton	Wisconsin
Deering, W. A.	Oconto Falls	Wisconsin
Dillon, H. P.	Oshkosh	Wisconsin
Dieck, Otto	Marion	Wisconsin
Dodge, E. C.	Lake Mills	Wisconsin
Doperalski, Frank	Kewaunee	Wisconsin
Eichel, Geo. F.	Rockville	Missouri
Erbstoeszer, H.	Sheboygan Falls	Wisconsin
Erbstoeszer, Edward	Sheboygan, R. 2	Wisconsin
Ehinder, Frank	Belgium, R. 3	Wisconsin
Ebeling, Louis	Glenbeulah, R. 31	Wisconsin
Ehrat, Geo.	Chicago, 20 Market Street	Illinois
Elmer, H. E.	Hustler	Wisconsin
Elmslie, A.	Milwaukee, Majestic Bldg	Wisconsin
Eastman, C. D.	Plymonth	Wisconsin
Einfeldt, H. B.	Milwaukee, Morton Salt Co.	Wisconsin
Eckstrand, Alfred	New Auburn, R. 1	Wisconsin
Elmslie, J. A.	Milwaukee, 911 Maj. Bldg	Wisconsin
Furrer, Ulrich	Hollandale	Wisconsin
Ferbend, Paul	Chicago, 71 So. Water Street	Illinois
Freund, Rudolph	Malone, R. 39	Wisconsin
Fischer, E. H.	Belgium, R. 1	Wisconsin
Fredriksen, J. D.	Little Falls	New York
Falck, Louis	Morrison	Wisconsin
Fischer, John	Plymouth	Wisconsin
Fister, H. C.	Milwaukee, Ft. 12th Street	Wisconsin
Fischer, John	Boaz	Wisconsin
Fitzgerald, M.	Watertown	Wisconsin

Fydrich, Wm.	Yuba	Wisconsin
French, G. M.	Darlington	Wisconsin
Falk, J. W.	Mayville	Wisconsin
Fokett, Chas. J.	Reedsville	Wisconsin
Fasbinder H.	Greenville	Wisconsin
Fiedlen, A. H.	Sheboygan Falls	Wisconsin
Green, W. C.	Albion	Wisconsin
Guse, P. W.	Madison	Wisconsin
Graskamp, H. H.	Loyal	Wisconsin
Grimm, Arnold	Allenville	Wisconsin
Gregorius, M. J.	Appleton, R. 4	Wisconsin
Goodman, Louis	Cadott, R. 2.	Wisconsin
Gartman, F. W.	Sheboygan, R. 4	Wisconsin
Gemer, R.	Barton	Wisconsin
Groaders, Sam	Campbellsport	Wisconsin
Grootemont, J.	Brillion	Wisconsin
Hougland, A. C.	St. Paul, 579 St. Peter St.	Minnesota
Hetzke, Elmer E.	Clintonville, R. 2	Wisconsin
Hild, John	Neptune	Wisconsin
Heckert, C. A.	Chilton	Wisconsin
Hoerl, Simon	Malone, R. 39	Wisconsin
Hasse, Louis	Juneau	Wisconsin
Hart, C. E.	Milwaukee, 186 36th St.	Wisconsin
Horr, C. B.	Chicago, 1000 Rector Bldg.	Illinois
Hanley, M. J.	Freeport	Illinois
Hood, Herman	Spring Green	Wisconsin
Hoesly, Fred.	Bangor, R. 2	Wisconsin
Hirsig, Robert	Lomira	Wisconsin
Hamm, A. E.	Kohlsville, R. 3	Wisconsin
Hanson, E. R.	Milwaukee, 151 13th St.	Wisconsin
Haaser, Fred.	Brillion	Wisconsin
Hertzberg, O. H.	Sheboygan Falls	Wisconsin
Heckman, Elmer	Kiel	Wisconsin
Indermuehle, Carl	Knowles	Wisconsin
Indermuehle, Henry	Theresa	Wisconsin
Indermuehle, Sam	Mayville, R. 3	Wisconsin
Indermuehle, Fred.	Oakfield	Wisconsin
Jones, F. E.	Chicago (Cry. Pack. Mfg. Co.)	Illinois
	Rockford, care of Nelson Hotel	Illinois
Johnson, Henry	Fairwater	Wisconsin
Jonely, B.	Brownsville	Wisconsin
Jorgenson, G. L.	Marshfield	Wisconsin
Jennings, A. A.	Chicago, 4 Sherman St.	Illinois
Jerikovec, John	Manitowoc	Wisconsin
Jones, A. A.	Fond du Lac	Wisconsin
Johnson, E. W.	Chicago, care of M D. T.	Illinois
Kalkofen, Herman	Elmhurst	Wisconsin
Kuenzi, Fred.	Beaver Dam	Wisconsin
Krebsbach, Nic.	Calvary Station	Wisconsin
Karnopp, Otto	Greenville	Wisconsin
Kalk, F. J.	Haven, R. 6	Wisconsin
Kuhn, J. J.	Cleveland, R. 1	Wisconsin
Kalmerton, Edward	Glenbeulah, R. 3	Wisconsin
Kaufman, L. O.	Sheboygan Falls	Wisconsin

Klessig, H.	Fredonia	Wisconsin
Kuich, Mike	Kewaunee	Wisconsin
Kohlman, R. F.	Fond du Lac, R. 6	Wisconsin
Konz, Joe	Elkhart Lake	Wisconsin
Kusel, L. H.	Watertown	Wisconsin
Knudson, Oscar	Montfort	Wisconsin
Kasper, P. H.	Welcome	Wisconsin
Kautsky, E. V.	Colby	Wisconsin
Krumrey, W. H.	Cleveland	Wisconsin
Kemschke, A. L.	Shawano, R. 2	Wisconsin
Kaufman, Edwin	Marshfield, R. 3	Wisconsin
Kirkpatrick, G.	Richland Center	Wisconsin
Keller, Edward	Grafton	Wisconsin
Kohli, Alvin	Mayville, R. 3	Wisconsin
Kohli, Robert	Knowles	Wisconsin
Keegan, John	Sandusky	Wisconsin
Keusch, Carl	South Wayne	Wisconsin
Koehler, A. C.	Plymouth	Wisconsin
Kachel, J. C.	Whitewater	Wisconsin
Koopmann, Albert, Jr.	Port Washington	Wisconsin
Kiel, C. & B., Co.	Kiel	Wisconsin
Karlen, J., Jr.	Monroe	Wisconsin
Kaufman, H. C.	Plymouth, R. 29	Wisconsin
Kraak, C. A.	Avoca	Wisconsin
Knuth, Edward W.	Hayton, R. 1	Wisconsin
Kachel, T. A.	Whitewater	Wisconsin

Lisney, Ole	Five Points	Wisconsin
Leischow, G. R.	Forestville	Wisconsin
Laack, A. C.	Sheboygan Falls, R. 8	Wisconsin
Lammers, A.	Waldo	Wisconsin
Lairig, I. F.	Chicago	Illinois
Luecke, C. H.	Plymouth	Wisconsin
Lindow, W.	Plymouth	Wisconsin
Lange, H. C.	Plymouth	Wisconsin
Larson, H. C.	Madison	Wisconsin
Lovell, R. C.	Juneau	Wisconsin
Linzmeyer, J. B.	Green Bay	Wisconsin
Larson, P. A.	LaCrosse, R. 3	Wisconsin
Lorenz, Emil	Reedsville, R. 1	Wisconsin
Lindow, F. O.	Elkhart Lake, R. 34	Wisconsin
Lee, C. E.	Madison	Wisconsin
Leitzke, Frank	Appleton, R. 1	Wisconsin
Lord, Frank	Boltonville	Wisconsin
Laing, I. F.	Chicago, 167 So. Water St.	Illinois

Meyer, M. H.	Madison	Wisconsin
Marty, Fred	Monroe	Wisconsin
Maedke, Ed. J.	Stanley	Wisconsin
Marschall, A.	Madison	Wisconsin
Mani, J. Fr.	Barneveld	Wisconsin
McCready, J. B.	Marshfield	Wisconsin
Millet, Chas.	Argyle	Wisconsin
Moore, C. B.	Dodgeville	Wisconsin
McKinnon, E. L.	Sheboygan Falls	Wisconsin
Marty, Gottlieb	Madison	Wisconsin
Moenning, Gustav	Sheboygan, R. 5	Wisconsin
Muehlberg, O. E.	Fredonia, R. 1	Wisconsin
Marschall, Chas.	Lomira	Wisconsin
McCormick, Chas. J.	Dodgeville	Wisconsin

Murphy, Morris	Chicago, 229 S. Water St	Illinois
Moore, J. G.	Madison	Wisconsin
Meyer, Math	Stanley, R. 2	Wisconsin
McManners H. S.	Madison	Wisconsin
Mayhew, E. B.	Greenbush	Wisconsin
Maechtle, R. C.	Port Washington	Wisconsin
Maas, Wm. F.	Milwaukee, Mitchell Bldg	Wisconsin
Nyffeneggen, John	Madison, B. 1074	Wisconsin
Naumann, Robt.	Two Rivers, R. 3	Wisconsin
Noyes, H. J.	Muscoda	Wisconsin
Naff, Louis	Monroe	Wisconsin
Nussbaumer, F. W.	Waldo	Wisconsin
Olsen, H. P.	Milwaukee, 220 Germania Bldg	Wisconsin
Ostrander, J. M.	Mineral Point	Wisconsin
Olson, Oscar	Five Points	Wisconsin
Osborn, John	Boscobel	Wisconsin
Parkin, A. W.	Pine Island	Minnesota
Purves, J. T.	Berlin, 1014 Wis. St	Wisconsin
Pingel, Henry	Appleton, 1135 Oklahoma Ave	Wisconsin
Pingel, E. C.	Elkhart Lake, R. 32	Wisconsin
Phepps, J. H.	Milwaukee, 106 Wis. St	Wisconsin
Pechman, H. R.	Kewaunee, R. 3	Wisconsin
Priede, H. W.	Kewaunee	Wisconsin
Pauly, Wm. H.	Manitowoc	Wisconsin
Parkhurst, S. D.	Chicago, 1000 Rector Bldg	Illinois
Pheatt, H. D.	Milwaukee	Wisconsin
Peacock, P. H.	Sheboygan	Wisconsin
Reinhold & Meyer	Plymouth	Wisconsin
Rohde, Otto	Manawa	Wisconsin
Rapple, J. T.	Reedsville	Wisconsin
Robinson, F. W.	Milwaukee, 916 Maj. Bldg	Wisconsin
Regez, Ernest, Jr.	Blanchardville	Wisconsin
Regez, Herman	Monroe	Wisconsin
Rolfe, J. H.	Chicago (Moxley Cold Stg. Co)	Illinois
Radloff, Max P. E.	Hustisford	Wisconsin
Ryman, R. C.	Spring Green	Wisconsin
Radder, Wm.	Wayside	Wisconsin
Roll, Emil.	Mayville, R. 3	Wisconsin
Roth, Chris.	Monroe	Wisconsin
Ruppert, Henry	Argyle	Wisconsin
Reiser, Nic.	New Holstein	Wisconsin
Reubin, Adolph	Barneveld	Wisconsin
Reid, J. J.	Oconomowoc	Wisconsin
Rowe, Harvey	Belmont	Wisconsin
Rehm, L. O.	Kiel	Wisconsin
Rapple, J. F.	Manitowoc	Wisconsin
Steinwand, A. M.	Colby	Wisconsin
Steinwand, J. F.	Colby	Wisconsin
Switz, Geo. H.	Ft. Atkinson	Wisconsin
Schoepfer, Herman	Hollandale	Wisconsin
Stiles, Henry	Ridgway, R. 1	Wisconsin
Stern, L. H.	Campbellsport	Wisconsin
Schaller, Alex	Barneveld	Wisconsin
Seider, A.	Random Lake	Wisconsin

Schujaln, Frank	Fond du Lac	Wisconsin
Sterns, Henry A	Grand Rapids	Wisconsin
Strub, Jacob	Plymouth	Wisconsin
Sudendorf, E	Clinton	Illinois
Swenink, O. H	Cazenovia	Wisconsin
Steinhart, Darwin	Muscoda	Wisconsin
Sixel, H. G	Cleveland	Wisconsin
Schiller, Anton	New Holstein, R. 3	Wisconsin
Strobel, K. L	Campbellsport	Wisconsin
Schmitt Bros	Kewaskum, R. 2	Wisconsin
Saenger, W. J	Lark	Wisconsin
Sonnabend, Theodore	Reedsville, R. 1	Wisconsin
Stocker, J. J	Dale, R. 18, Bx. 2	Wisconsin
Sulte, R. F	Plymouth, R. 24	Wisconsin
Scholl, W. F	Spring Green, R. 1	Wisconsin
Schmidt, Fred	Readfield	Wisconsin
Straubel, C. A	Green Bay	Wisconsin
Schuknecht, H. E	Chicago, 256 Madison St	Illinois
Shackell, C	Milwaukee (A. R. T. Co.)	Wisconsin
Shumway, C. P	Milwaukee, 102 Wis. St	Wisconsin
Streveler, Nick	Mosinee	Wisconsin
Swingle, E. G	Avoca	Wisconsin
Schultz, H. S	Cato	Wisconsin
Sohrweide, August	Hilbert, R. 4	Wisconsin
Sixel, O. W	Cleveland	Wisconsin
Sauby, Norman	Larson, R. 15	Wisconsin
Simon, M	Bavaria	Wisconsin
Stewart, L. R	Spring Green, R. 2	Wisconsin
Stephany, John	Malone, R. 38	Wisconsin
Sammis, J. L	Madison	Wisconsin
Sweeting, C. W	Manitowoc	Wisconsin
Stoeling Bros. Co	Kiel	Wisconsin
Scott, H. M	Waldo	Wisconsin
Schneider, Oswald	Appleton, R. 1	Wisconsin
Schwantes, O. R	Sugar Bush	Wisconsin
Southard, Roy	Marshfield	Wisconsin
Schlafz, W. J	Auburndale	Wisconsin
Skinner, D. P	Milwaukee	Wisconsin
Sommer, Arthur	Madison	Wisconsin
Sampe, O. F	Chilli	Wisconsin
Stern, W. P	Brillion	Wisconsin
Sangen, F. C	Lark	Wisconsin
Sohnweide, Wm	Chilton	Wisconsin
Schneider, Otto	South Kaukauna, R. 15	Wisconsin
Streveler, Joe	Mosinee	Wisconsin
Thomas, W. C	Sheboygan Falls	Wisconsin
Thomas, J. H	Eldorado, R. 10	Wisconsin
Trudalle, S. F	Milwaukee, 11 Mitchell Bldg	Wisconsin
Thompson, C. I	Milwaukee, 912 Maj. Bldg	Wisconsin
Tabbert, Walter H. P	Two Rivers, R. 2	Wisconsin
Ubbelohde, T. A	Glenbeulah	Wisconsin
Urben, Alfred	Blue Mounds	Wisconsin
Voss, Ed	Appleton, 903 State St	Wisconsin
Voigt, C. A	Spencer	Wisconsin
Voigt, W. A	Eau Claire	Wisconsin
Van Blarcon, L. B	Fond du Lac	Wisconsin

Van Duser, James	Hebron	Wisconsin
Viergutz, F. A.	Appleton	Wisconsin
Voigt, Gus	Granton, R. 2	Wisconsin
Vogel, Gottfried	Monroe	Wisconsin
Witt, A. C. F.	Embarrass	Wisconsin
Williams, E. B.	Spring Green	Wisconsin
Winder, Wm.	Rockbridge	Wisconsin
Wegner, Geo. A.	Eldorado	Wisconsin
Witmer, J. L.	Mayville	Wisconsin
Westphal, F. C.	Poynette	Wisconsin
Wyss, John	Mt. Horeb	Wisconsin
Weidrie, J. B.	Arlington Heights	Illinois
Wittwer, Ed.	Monticello	Wisconsin
Wagner, H. B.	Milwaukee, 912 Maj. Bldg.	Wisconsin
Westphal, Aug.	Neosho	Wisconsin
Williams, C. H.	Lake Mills	Wisconsin
Woldt, Theo.	Greenleaf	Wisconsin
Wheeler, J. H.	Plymouth	Wisconsin
Werth, A. C.	Appleton	Wisconsin
Wis. Butter & Cheese Co.	Waukesha	Wisconsin
Willard, J. C.	Plymouth	Wisconsin
Wordel, H. E.	Wayside, R. 1	Wisconsin
Wyss, John	Mt. Horeb	Wisconsin
Wallace, P. W.	Hortonville	Wisconsin
Wolfe, S. A.	Twin Bluffs	Wisconsin
Welsch, W. S.	Montfort	Wisconsin
Zirk, Harry M.	Brillion, R. 1	Wisconsin
Zorn, Emil	Elkhart Lake, R. 32	Wisconsin

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS

OF THE

Wisconsin Cheese Makers' Association

NINETEENTH ANNUAL MEETING, 1911.

The Wisconsin Cheese Makers' Association met in its nineteenth annual session at Freie Gemeinde Hall, Milwaukee, and was called to order at 10 o'clock A. M., Wednesday, January 11, 1911, by the president, Mr. John B. McCready.

The President:

The first on our program this morning is the address of welcome by Mr. F. A. Cannon, secretary of the Citizens' Business League. I think we are all more or less acquainted with Mr. Cannon and I am sure we will be pleased to hear from him.

ADDRESS OF WELCOME

F. A. CANNON, MILWAUKEE, WIS., SECRETARY CITIZENS' BUSINESS LEAGUE.

Mr. Chairman, Ladies and Gentlemen of the Convention,—

The president remarked that you are all familiar with Cannon. It recalls an experience which I very often have in greeting conventions. I notice when my name is announced it appears to have rather a familiar sound and the delegates begin to look at one another and talk, and I find the ordinary inquiry is whether or not I am any relative of Joe Cannon. Right out at the outset; let me state that some years ago when I was asked whether I was any relative of Joe Cannon, under the conditions prevailing at that time, I did not deny it but with the recent evolution of events, I seem to take it upon myself at the outset to indignantly deny a charge of that kind.

Now, Gentlemen, it is a pleasure to me indeed, to welcome the members of the Wisconsin Cheese Makers' Association to Milwaukee. It is an auspicious beginning of the New Year that this organization meets here. We are to have one hundred and fifty conventions in Milwaukee this year, and we regard it as quite applicable that the convention season should be opened by the Wisconsin Cheese Makers' Association, for your organization occupies a unique and foremost position in this state.

In the first place, as I understand it, Wisconsin is the greatest cheese producing state in the country. In the second place, the Wisconsin Cheese Makers' Association is the largest association of that character; and in the third place, the Wisconsin cheese is of the highest quality and commands a premium in the markets of this country. So I say it is quite applicable that we should open the convention season by welcoming an organization which has so threefold a distinction.

In looking at your program, I find that the output of the cheese factories in the past year amounted to twenty-three million dollars. That is an enormous output. Milwaukee has a great reputation as a brewing center, its reputation has gone all over the world. As a matter of fact, although those

great interests are enormous, covering whole blocks, employing thousands of men, and have carried the fame of this city to all corners of the globe, the output of the cheese factories of the state of Wisconsin is as large as the output of the brewing interests of the city of Milwaukee, so, gentlemen, you have a great industry in quality, a great industry in quantity, and all of this is due, I believe, to the high character of the work of this Association before which I have the honor to appear.

In the evolution of events we hear very much the cry of back to the land. We are coming to that point of view, that same point of view where we find that the man who lives close to the soil, after all, lives the sanest, the most wholesome, and the safest life of any man. Evolution is bringing thousands of people into the large communities with thousands of mouths to feed, and the number of hands to make the food for them fewer; and this evolution is placing those elemental industries, which are traced to the soil, in a higher and more commanding position.

As a man who has been born in the city and lived there all his life, I can freely say that those who are engaged in an industry like yours are to be envied by those who live in the large communities. The stress of life in the large communities is becoming terrific. You gentlemen live a life more independent, under the wide starry sky, under the most wholesome influence, under the influence which tends to the highest betterment in a physical, moral and intellectual way.

So I say, Gentlemen, I am glad to meet you on this occasion. It is a great thing for the people directly interested to come here. There are some things, naturally, in a great city that are done better than they are in the smaller communities. Upon the other hand, it is a good thing for us to go to the country and there get in touch with nature and her beauty and wholesome influences which exist there. We are all living in this great commonwealth and doing what we can to advance its influence. Our life is a co-operative one, and whatever is to the advantage of Milwaukee is to the advantage of Wisconsin, and whatever is to the advantage of Wisconsin is to the advantage of Milwaukee.

So, Gentlemen, I bid you welcome. I trust that your delib-

erations may be filled with good and profit and that the annual visits of the Wisconsin Cheese Makers' Association may endure with us through the length of years. I thank you.

The President: In response to this very hearty address of welcome, we will hear from our old friend Mr. W. C. Thomas, of Sheboygan Falls, Wis.

RESPONSE TO ADDRESS OF WELCOME

W. C. THOMAS, SHEBOYGAN FALLS, WIS.

Editor Dairy Market Reporter.

Mr. President—Mr. Cannon, Secretary of the Citizens Business League and Citizens of Milwaukee.

On behalf of the Wisconsin Cheese Makers' Association I want to thank in my humble way the city of Milwaukee for this cordial reception.

The Wisconsin Cheese Makers' Association has met in annual convention in your city so many years in succession, that its members feel quite at home here, even without the formality of an address of welcome.

Still, the kind words of Mr. Cannon are reassuring and are fully appreciated by this association.

This association has had the pleasure of holding its annual meetings in Milwaukee when the republicans were in control, also when the Democrats ruled the city, and now we meet here while the Social Democrats are in full charge of municipal affairs. On each occasion we have been received with the same warm welcome, and when the Probibitionists have their inning and assume control of Milwaukee and all that has made it famous, we presume the same kind greeting will await us.

This Association represents an army of skilled workmen, who manufacture the finest cheese in the world, both American and Swiss and many other varieties, and every one of its members

has a warm place in his heart for Milwaukee the metropolis of the greatest dairy state in the union.

Milwaukee is the bright spot socially and commercially of which all are proud.

Milwaukee stands for hospitality and good cheer and that is one of many reasons why we are glad to be here and hope to come again. I thank you.

Vice President A. C. Koehler, of Plymouth, takes the chair. The Chairman: We will next listen to the annual address of our president, Mr. John B. McCready, of Marshfield.

PRESIDENT'S ADDRESS

JOHN B. MCCREADY, MARSHFIELD, WISCONSIN.

Mr. Chairman, Ladies and Gentlemen:—Our friend Bobby Burns says:

"The best laid schemes o' mice and men gang aft a-gley." Before I went to Canada on the 21st of December, I wrote an address for the Cheese Makers' Convention in which I made several predictions, in other words I was betting on the future. Now my memory is failing me a little with old age and my friend Aderhold remarked a few years ago that I was nothing but a "strawberry blonde", but I am getting over that too, and as my memory has played me false at times I did not propose to start out and finish where I started, so I have committed my address to paper.

I assure you that it gives me pleasure to have this opportunity of again appearing before you as president of your Association, and more so as I feel that this is destined to be the banner convention of all that we have yet held. The indications at this opening meeting would warrant me in saying that we will have throughout this convention, the biggest attendance we have ever had. For this there is a reason. A glance at the program will show that your worthy secretary, U. S. Baer, has left no stone unturned to give you value received,

in exchange for the money you will spend in attending this meeting.

The list of Prizes and Special Premiums will show that our friends, The Supply Men, have responded with their usual liberality.

I am safe in saying that your officers have all made a special effort to make this meeting a success, and now then it is up to each and every individual member to get busy and do your share too of booming, not only at this convention, but also at the ones to follow in the future. There is no reason in the slightest why this Association should not have a membership of, at least, 1,500. If each member will do just a little boosting, this can be very easily accomplished.

Your officers can't do any more than they have done, unless they be placed in position to devote all their energy to this work. Unfortunately none of us are in position to do this, so it is up to each and every individual to help, in fact, do as the Irishman said, start something even if it is nothing more than a row, for as a rule, people who never start anything never finish anything. We must not be content to rest on our oars and say "Well done". We have not reached that point where we can fold our arms and say our work is finished. Until this Association numbers eighteen hundred, it is up to us to seek out the sinners who have not found their way into our midst, and teach them the error of their ways.

Do not think because Wisconsin is the biggest cheese state in the Union and because she has the reputation of being the best, that we are all perfect, for we are not. There are thousands of dollars lost by the dairyman of this State every year from the fact that there is poor milk produced, poor cheese factories and poor curing rooms in which to convert poor milk into good cheese, and last but not least, cheesemakers who do not understand their business, and who are entirely unfit to be classed as cheesemakers.

These men will be weeded out in time, but it takes time, and we can help by being careful whom we recommend to positions as cheesemakers.

At a previous convention I spoke of the advisability the cheesemakers of this State organizing a separate, distinct Association, in each county, and I am still of the opinion that

this would be a mighty fine thing. The object of such on Association would have as a prime factor the improvement of your own conditions. Every cheesemaker in the county seeking employment could be passed upon as to his qualifications by your board, selected for just such purposes. In this way, a man of one, two or three months' experience, who was not proficient in his work, would be kept out of cheese factories until such time as he learned his business, and would not enter into competition with you of more mature experience.

I know that there is such an Association in Polk county, and while in that county they handle cheese in only a small way, yet their meetings arouse a good deal of enthusiasm, and not only do the cheesemakers attend these meetings, but the farmers also, and you cannot tell me that meetings of this kind, where both the producer and the manufacturer come together, with the good intention of learning something, are not of great benefit.

Again; this is my honest opinion, that the cheesemakers of this state are underpaid. The cost of producing a pound of cheese today is 50 per cent greater than it was eight years ago, yet the price paid for making, has not increased a particle; furthermore, the prices obtained for cheese and paid to farmers, are all on a higher level than they were a few years back, and yet the cheesemaker does not seem to share in this general advance of prices.

The county organization could be used to determine prices for making cheese, that would be fair and equitable, and there is no reason why good cheesemakers should not be encouraged to stay in the business by being paid for what their services are worth. Poor cheesemakers are dear at any price and the sooner they are put out of business, starved out if necessary, the better.

I do not wish to take up any more of your time knowing that there are those to follow on this program to whom you would rather listen, but I can assure you that I believe it is good to be here and I hope and trust that everyone in attendance at this convention will enjoy their visit to Milwaukee, and at the same time learn something that will be of benefit to you in the coming season's work.

President McCready resumes the Chair.

REPORT OF BOARD OF DIRECTORS

Jacob Karlen, Jr., Monroe, Wis.
Gentlemen:

A meeting of the directors and officers of the Wisconsin Cheese Makers' Association was held in the city of Milwaukee on April 23rd, 1910.

By order of the board of directors it was decided to hold the ninteenth annual convention in Milwaukee, Wis., January 11th, 12th and 13th, 1911.

We have examined the books of the Secretary and Treasurer and have found same to be correct.

(Signed) JACOB KARLEN, JR., Monroe.
JOHN GROOTEMONT, Brillion.
J. W. CROSS, Mauston.

REPORT OF SECRETARY.

U. S. BAER, MADISON, WIS.

Mr. President, and Members of the Association: I have the honor to submit the seventeenth and eighteenth annual reports of the Wisconsin Cheese Makers' Association in accordance with the following resolutions unanimously adopted at the executive meeting of the directors and officers of the Association held at Milwaukee, Wis., April 23d, 1910:

WHEREAS, The Wisconsin Legislature of 1909 repealed the law providing for the publication by the state of the proceedings of the Wisconsin Cheese Makers' Association; and

WHEREAS, On account of the aforesaid action of the Wisconsin Legislature, it is incumbent upon the board of directors of the Wisconsin Cheese Makers' Association to provide in some way for the publication of the proceedings of that Association; and

WHEREAS, The Sheboygan County News and Dairy Market Reporter, with Mr. W. C. Thomas as editor and proprietor, has

for many years been a capable, trustworthy and consistent friend, supporter and promoter of the special interests of the Wisconsin Cheese Makers' Association; therefore be it

Resolved, That the Sheboygan County News and Dairy Market Reporter is hereby designated as the official organ of the Wisconsin Cheese Makers' Association; and be it further

Resolved, That the president and secretary of the said Association are hereby authorized and directed to make all necessary arrangements for the publication of the proceedings of the annual meetings of the Wisconsin Cheese Makers' Association in the hereinbefore designated official organ of the Wisconsin Cheese Makers' Association and the furnishing of each member of the said Association with a copy of said published proceedings:

The dairy press of the entire country as well as the Wisconsin press, has continued loyal to this organization. They have freely given wide publicity to our announcements; have always been true advocates of our cause; have ever been boosters and never knockers.

Permit me to say that if we are to hope for help, be it from the state or any other source, private or public, we must be willing to help ourselves, and, gentlemen, I appeal to you to-day to become members, if not already so, and I trust that not one cheesemaker in attendance at this meeting will leave the city without first taking out a membership, securing the annual report and becoming one of us. In union there is strength and mutual aid, and the future success of this association depends largely on the hearty co-operation of all the cheesemakers in the state, in fact all who are interested in any way in this line of business.

Our cash pro rata premium fund this year is over one hundred and fifty dollars. A premium fund secured under the conditions now employed by this association, can be enjoyed with a much greater feeling of independence than when solicited from unwilling contributors, and nothing will so add to the interest and bring out a larger number of exhibits than this one particular thing of making a larger premium fund.

The dairy supply boys and cheese dealers have stood with us this year as in all the years past. These men are all

broad-minded, intelligent men, and have the good of the business at heart and use their influence in the right direction at every available opportunity. Their influence upon the development of the dairy industry in this state can never be fully known. It is certainly great. So, too, their influence upon this association has been a great factor in its development. Had it not been for them, this society to-day would not have been as strong and as influential and as progressive as it is. The dairymen of the state, the buttermakers and the cheesemakers of the state, members of this association, all owe much to the army of splendid dairy supply men who make their regular trips through the state. On the other hand, these supply men owe much, owe all, it may be said, to the dairy industry. The benefit is mutual.

The cheese product of our state to-day is superior to that made in any former period in the history of the industry.

Cheese making is rapidly becoming the specialty of districts of wide area in Northern Wisconsin. It is now regarded among the most progressive and highly developed forms of farming in the state. Co-operative and commercial organizations are being formed to conduct the business locally and to guard its general interests. State laws are being rapidly enforced by the Dairy and Food Commission, which have been the means of very materially fostering this industry during the history of the department under Honorable J. Q. Emery's wise and energetic supervision.

The itemized report of the treasurer will show the sources from which all moneys paid into the treasurer's hands were received, and disbursements made on orders received from this office which he holds as vouchers. The books of the treasurer and secretary are open to every member of this association and may be found at room 78, Republican House.

In conclusion I desire to express my high appreciation and heartfelt thanks for the confidence reposed in me for the several years I have served as your secretary, which has ever been extended to me on every occasion, as opportunity offered, by all members of the association.

TREASURER'S REPORT FOR 1911.

P. W. WALLACE, HORTONVILLE, WIS.

Mr. President and Members of the Association: The following report, showing the sources from which all moneys paid into the treasurer's hands were received and the disbursements made on orders from the secretary, which I hold as vouchers:

Receipts.

1909.		
Oct. 2.	Balance brought forward	$255.63
Oct. 23.	Membership fees	353.00
Oct. 23.	Hon. S. A. Cook	25.00
Dec. 13.	Membership fees	10.00
1910.		
July 15.	State Treasurers' draft	600.00
Dec. 31.	Program advertising	530.00
	Total receipts	$1,773.63

Disbursements.

1909.		
Oct. 20.	Postage stamps	$15.00
Oct. 20.	Saxe Sign Co., signs	3.50
Oct. 22.	J. B. McCready, expenses, October meeting	10.88
Oct. 23.	Schwaab Stamp & Seal Co., badges	20.00
Oct. 23.	U. S. Baer and J. W. Cross, expenses, October meeting	34.50
Oct. 23.	Josephine Malloy, stenographic work	9.40
Oct. 27.	Walter Mayer, printing program	100.00
Nov. 1.	Bank of Monroe, cash and interest	210.00
Nov. 3.	Jacob Andrea, expenses, January meeting	11.24
Nov. 3.	Alex. Schaller, expenses, January meeting	10.25
Nov. 15.	Postage, reports, telephone, express	12.00
Nov. 20.	Miss A. B. Roump, stenographic work	12.90
Dec. 2.	W. C. Thomas, printing	16.10
Dec. 11.	J. B. McCready, traveling expenses	5.36
1910.		
Apr. 23.	J. B. McCready, traveling expenses	13.66
Apr. 23.	A. C. Koehler, traveling expenses	3.06
Apr. 23.	Jacob Karlen, Jr., traveling expenses	6.70
June 1.	U. S. Baer, expenses of secretary's office	46.94
July 11.	U. S. Baer, traveling expenses	9.28
Aug. 8.	W. C. Thomas, printing and mailing annual report	200.00
Aug. 13.	U. S. Baer, expenses of secretary's office	20.63
Oct. 5.	J. B. McCready, traveling expenses	27.92
Nov. 1.	Miss A. B. Roump, stenographic services	23.98
Nov. 9.	U. S. Baer, expenses of secretary's office	20.28
Nov. 14.	J. B. McCready, postage and 1,786 letters	38.47
Nov. 17.	W. C. Thomas, printing	19.00

Dec. 1.	Miss A. B. Roump, stenographic services..	7.73
Dec. 8.	Express, postage, telephone, diplomas....	35.28
Dec. 12.	J. B. McCready, traveling expenses.....	9.51
Dec. 13.	Streisguth–Petran Engraving Co., cuts....	21.45
Dec. 16.	W. C. Thomas, printing.....	24.50
Dec. 23.	Mayer's Electric Press, printing program..	225.30
Dec. 23.	Mayer's Electric Press, printing.....	7.25
Dec. 30.	U. S. Baer, traveling expenses, postage, express	24.98
Dec. 31.	Miss A. B. Roump, stenographic services..	5.00
	Total disbursements	$1,262.05
	Balance in hands of Treasurer.....	511.58
	Total	$1,773.63

On motion, duly seconded, the reports of the board of directors, Secretary and Treasurer were adopted as read.

The President: The object of this first session is to get started and I think one of the best things of a cheesemakers' convention, or any other convention, is the opportunity which presents itself of getting acquainted. While there is nothing on the program this morning, except the inspection of cheese, I want to again remind you that we cannot put up much of a fight without the almighty dollar at the present writing, and I am going to suggest that you find your way to the box office and do not forget the little donation of one dollar. A dollar will not break you and it will not really make us but it will help us, so do not forget it.

Now there are a few old faces among the audiences, and I am going to call on our old friend, Mr. Shilling, to talk to us for a few minutes.

ADDRESS.

S. B. SHILLING, CHICAGO, ILL.

Editor, Chicago Dairy Produce.

Mr. Chairman and Gentlemen: I do not know why I was selected as the first person to appear before you, after your regular program had been disposed of. The fact is that of all men who could find an excuse for talking to you I really have the least. I cannot talk to you about your business because I know nothing about it. I would like to talk to you on some subjects about which I can instruct you, but what I will say will be along the line that I am familiar with. I am not like the fellow who never told a story without adding something to it. Invariably when he told anything he enlarged upon it and told it with so much earnestness that at last he would come to believe it himself. At one time this fellow was talking and he said that he remembered when he was a little boy that he planted a tree and at last it took up so much ground that they cut it down and finally split it up for posts; in the center of that tree, where there was not a single cavity or opening of any kind, he found a snake, alive and well, the snake being over a foot long. "Is that not a remarkable thing," said he, "what do you think of it?" There was a wag in the audience who said "That's easy, it's a damn lie."

I am glad, for one reason, that I have been called upon at this time for I am going to say all that I will say to you at any time at your meeting. I did not expect to be on the program until this afternoon, but I am going to take advantage of being called at this time and say all I would say to you later.

I want to say to you cheesemakers of Wisconsin that you are making a reputation for your state, second to none in the United States and sometimes when I get to thinking of the wonderful cheese industry in this state, I realize how remarkable it is, the extent of your industry and what it has done for your state, and what you as cheesemakers have done. You have advanced the interests of the state by the excellence of your work, by the excellence of the product that you are producing and putting on the market.

If I were to tell you just exactly what I think about the dairy industry today, I would say that I believe we are standing in the most critical position that we have ever been in. I want to say to you that the dairy industry is threatened in a way it has never been threatened before. I do not refer to oleomargarine, although that is the subject about which I was to talk to you today, but I want to say that you are probably confronted by the same menace as the buttermakers are. We are on the verge of a revolution in the butter business. I mean it as strong as I say it to you today, that we are on the verge of a revolution in the butter business, because we are producing a product in the butter line that the consuming public is absolutely refusing to accept today and even last month there were twenty million pounds increase in the output of the product, that is, our storage houses have twenty million pounds more than they had in store a month ago. They are filled to the ceilings. The butter cellars from one end of the country to the other are in the same condition and, although prices have increased six to seven cents a pound inside of thirty days, that butter is in the cold storage warehouses, in the ordinary cellars and butter boxes of the country, and absolutely there seems to be no outlet. There is a reason for this. It is because of the poor raw material from which we are making that butter.

Another thing, in all our markets today, in the New York market, in the Chicago market, this condition is prevailing, that every little town through the South that two or three years ago was receiving and consuming our butter product, today is not taking a pound of it. Hundreds of little cities in Pennsylvania and New York, that heretofore have been markets where our product has gone are today shipping butter into our big markets. Why is this? Because the people are not consuming the butter and they have a substitute on the market that is better than poor butter. I might as well tell you the truth that it is better than the poor butter that is placed on the market, and the consuming public is absolutely refusing to accept the bulk of the butter that we are getting.

This is the situation that confronts us today. I do not know whether you are aware that last week one of the largest butter buyers in the country has gone into bankruptcy in Chicago, simply because he had in the neighborhood of twenty thousand

tubs of this poor butter, butter of low quality for which there was no possible outlet, and when the banks called him to put up $40,000 he could not do it. And this we are sure is only the beginning. There is not too much butter made if the butter was all of the good quality that it should be.

I want to show you the situation in butter, because cheese making is part of the dairy business, and I want to say to you that we will have to change our methods in the butter business, and in my opinion the only way to do that is to have a difference in the range of prices of butter. There has been very little difference in the price of good butter and the price of poor butter, and the fact is that the man producing the poor article of cream has received the same price for it as the man producing a good article. That is all wrong, entirely wrong, and this condition now is very bad. It is making no difference in the price of a good product and a poor product, and that is something I believe you as cheesemakers, as well as the butter makers, have to come to, and that is we will all have to pay more for quality. I know that the dairy interests today, the butter manufacturing interests, are up against that proposition, they have to pay for quality. If a man is producing a good quality he should have a good price for it, and if his product is not good he should be paid such a price as will drive the poor quality of goods from the market.

The oleomargarine question is something, as you are aware, that we always have with us; we have had it for a great many years and we have it at the present time. Legislative matters are so confusing at the present time, that I believe when the oleomargarine matter comes up again there will not be a particle of show of getting any kind of legislation on it. I give you this situation. It is something in which you are as much interested as are the buttermakers. We have the assurance of the best men we have in Congress that in their opinion no oleomargarine legislation will be undertaken during the present session of Congress, although this will not excuse us from keeping up the vigilance we have had to keep up for the last three years. A great deal of the last session of Congress was devoted to hearings on this question, and at least a half dozen bills were offered to Congress, all looking to a repeal of the present oleomargarine law. The condition remains today as it always has.

We have always said that we want protection from the sale of a product which was a counterfeit of ours and we want to have it sold for what it really is. That is what we asked for at the beginning, we ask it now and insist on it, and all the hearings before the Committee on Agriculture have been conducted along that line. There are as many differences of opinion as to how to obtain the result as there are members of the committee, no two bills are drawn exactly alike, they vary. Some are drawn with a view of misleading the people and throwing the market open to the sale of oleomargarine without any restriction whatever. In fact, seven-eights of ths legislation undertaken at the last session of Congress was undertaken with the view of simply doing away with any kind of restraint or restriction in the manufacture of the product, also in its sale.

This is a matter in which you are interested equally with us, and, while you have given us your support during the past years, we hope you will continue to do so in the future. The dairy interests of the country are going to have all they can do to swing this matter and secure legislation that will give them any kind of protection. But, as I said before, I believe for the present there will be nothing done at the present session of the legislature, for various reasons. The mixup in the political situation leaves one legislation afraid to do anything without incurring the enmity of another.

That brings me to another phase of the question that may or may not interest you. I speak now of the tariff in regard to cream being shipped into this country from Canada. The matter has become so serious over there that several of the provinces have had the question up and tried to stop the shipping of cream into this country. In entire counties the creameries and cheese factories have closed and the cream is coming across to this country. Under the old tariff law, there was a tariff of two cents a pound on cream shipped to this country and a tariff of six cents a pound on the finished product. While we have no way of knowing whether it was intentional or otherwise, in the revision of the tariff the duty was made five cents a gallon on cream and the finished product was no less than it is at the present time, that is six cents a pound. A gallon of cream comes very close to being five pounds, and as the tariff is five cents a gallon it opens the doors of this country to the importing of

the foreign product of butter into this country at one cent a pound. The difference in the markets of this country and markets of Canada for the past two years has been on an average eight cents in favor of this country. This has opened up an outlet for their cream and of course it all is largely to the detriment of the agricultural dealers of this country, and we have undertaken to remedy that. I took the matter up early in the winter with the new Tariff Commission, in behalf of the National Creamery Buttermakers' Association, in an effort to get the mistake corrected but with poor success as yet. I have taken it up with several senators and yesterday received a letter from Senator Cummins, of Iowa, in which he said it would be absolutely impossible to secure any change in the present law unless a resolution is passed in both Houses, which will permit the opening of that portion of the tariff bill without opening all the tariff question. This information came to me yesterday, and Senator Cummins also advised me that he is still giving the matter his attention and doing the very best he can for us and hopes yet we may be able to get that portion of the tariff rectified. As to the possibility of injuring us it is this, during the first four months since the present tariff went into effect, the increase in the product coming into this country was over 100 per cent. This is a serious question and one that demands your attention, demands the attention of every dairyman in this country, because it is something that has to be met sooner or later. We hope, if this should come up, that you will see that your legislators in Washington are instructed to pass the resolution of that kind and change this tariff that permits butter to be imported into this country at a tariff of one cent a pound in an unfinished state, and in the finished state at six cents a pound.

There is one more matter in which we are interested and which I believe is so radically wrong that I would like to call your attention to it, briefly, and that is the small amount of money that is being received for the promotion of agricultural interests in this country from the government. Did you ever stop to think that the military department of this country last year had three hundred and ninety million dollars for the support and maintenance of that part of our government? If we would figure with this the money that was put into fortifica-

tions, add the interest on it, and the money that is being paid on pensions, we would have a sum that runs up to four hundred and fifty million dollars, while Agricultural interests only receive $13,458,000, while the support of the army and navy, without the possibility of a war of any kind, receives $450,000,000. To me it is an outrage, and I want to say to you that the best legislators of our country are taking notice of it and we hope for relief. If they will give to the agricultural interests of our countryq one-half or even one-third of the amount devoted to the military department, they will make us so strong and so powerful that we need not be afraid to meet the commerce of the world. It is a question that has to be considered, because the people of this country are becoming disgusted with militarism and while I am not arguing against existing conditions, I do feel in favor of arguing for a larger appropriation for the agricultural interests of this country. Agricultural interests are so deeply concerned with matters that really amount to so much, I do feel this is a question that should be discussed. I hope your resolution committee will offer you some kind of resolution in regard to this importing of cream into this country. I do not know whether the importation of cream into this country affects your industry or not, but if it does in any way look serious to you I would like to see you pass a resolution asking your members of Congress to see that the matter is changed if possible. With this tariff, there is no reason why they could not ship cream from as far as New Zealand or Australia and deliver it in this country, which would throw our markets open to the world in competition with our own product.

Now, Mr. Chairman and Gentlemen, I want to thank you for allowing me to stand before you and giving you these few ideas, which came to me as I stood here. You know that we have heard lately the cry of high living. At the last session of Congress a committee was appointed for the purpose of investigating the reasons for such an advance in the cost of living. It was not taken into consideration that we today are not producing the food products that the people of this country are consuming, or at least we are not doing more than that; and I want to say to you, and make this statement in the shape of a prophecy, that we will never in the history of this country see cheap food or cheap food products. We are not producing

enough and for that reason I feel I am justified in standing before you and arguing for a more liberal appropriation to build up agriculture instead of giving so much to other departments of the country. There was $25,000 appropriated for the work of this committee to investigate this and when they got through with their investigations, they gave a woman's reason. That is the only excuse they gave, they said it was "because." About two months ago the minority members said it was the tariff.

If I were talking to the buttermakers now I would say "You are undoubtedly interested, your fight wants to be made on quality for raw material." I suppose this effects you the same as the buttermakers, but the thought I want to leave with you is that inside of five years the creameries that the producing this product today, which is filling the cold storage warehouses and cellars of our country, are going of necessity to quit business because there will be no sale for that kind of product, and when I said first that there is going to be a revolution in the dairy industry of this country that is what I meant by it, that the manufacturer has to produce a fine article or quit the business. I thank you.

The President: I am sure there is a great deal of truth in what Mr. Shilling has said and it does not affect the butter business alone, quality is what we have to have in the cheese business. Anything that affects the butter interests affects our interests. I believe it is the wish of every honest dairyman, to at least lend all the support possible to any movement that will improve or in any way better our conditions. We have to be selfish, because if we are not there will be nobody else to look out for us.

I am going to call on one more gentleman to speak before dinner, and if he cannot say anything he will at least tell us a story. I will ask the former president of our association, Mr. E. L. Aderhold of Neenah, to talk to us for a few minutes.

REMARKS.

E. L. ADERHOLD, Neenah, Wis.

Cheese Factory, Dairy and Food Inspector.

Mr. Chairman, and Gentlemen:—I think we all ought to enter into the spirit of the convention with a great deal of warmth and keep things lively. We have to do that in our business to be successful so that we will not be compelled, as some people are, to eat ox tail soup and ox tongue in order to make both ends meet. There is a good deal to be learned by personal contact here and we ought to get the most benefit we can while we are here. In fact some people claim that contact is education. A man in business now-a-days has to be very alert, and I can appreciate what Mr. McCready said about the compensation of the cheesemakers. It is not what it ought to be. The pay the cheesemakers have been receiving for the last six or eight years has been in many cases from one quarter to one half a cent too low for good work. There are a great many factories that ought to be improved. There ought to be an outlay of money, in many factories, from $500 to $1,500, ought to be expended to put the factory in first class condition; yet the competition is such, and the compensation for making is such, that the cheesemakers are afraid, and they have a right to be, to put in the necessary investment, and I think Mr. McCready's remarks were very timely. I saw a man at a creamery last summer, a very good manager who attends to anything that goes wrong. The day I was there he had a Rorsion cream sale; the spring snapped in two and he immediately took it to the blacksmith shop and had it repaired. It certainly pays to pay close attention to details and not delay in making repairs.

I was very much interested in what Mr. Shilling said and I wish there had been time to discuss that question of cream tariff and the revolution in the dairy business about which he has been talking. If that is the only thing that will bring about the sale and production of clean milk and cream, it seems to me it cannot come any too soon. I would like to ask some questions about that if there is time, Mr. Chairman. Have we any time to discuss this?

DISCUSSION.

The President: We have a few minutes yet.

Mr. Aderhold: It is my understanding of the butter situation that we have not been producing as much butter as we need in the United States and that we cannot produce as much as we need in the future. Is that true, Mr. Shilling?

Mr. Shilling: I believe it is true.

Mr. Aderhold: It is my understanding that butter, if it is good, is a very good article of food, and people are better off if they can have butter to eat than if they cannot. Is that not so?

Mr. Shilling: Undoubtedly.

Mr. Aderhold: If we cannot produce as much butter as we need and butter is good for us, why put a protective tariff on it?

Mr. Shilling: My answer to that is this, that I believe we will reduce the price of the product. Butter is a condensed product; it is a product produced at great expense of labor. If we reduce the price of that product, it does not make any difference whether we do it by the importation of cream, and reduce it to a point where our people will not make it, we will reduce the supply in this country. I think that is good logic and will hold, for if it does not bring a price remunerative for the farmers, they will quit producing and there will be no production of that article in this country, and the same will apply to any other product. Our tariff law has been for the encouragement of industries in this country from the beginning up to the present time. It is for the encouragement of industries, to promote the manufacture of products, and also for the promotion of the agricultural industry in this country. That is the only way I can argue this out.

Mr. Aderhold: It is my understanding that this tariff was placed on butter at a time when we had more dairy products than we needed for our own consumption. At the present time that condition is reversed. We cannot produce as much butter as we would like to eat.

Mr. Shilling: We can do it; but we will not.

Mr. Aderhold: We cannot until we raise the cows and that takes a little time. We can increase the supply of pork faster than we can the dairy product from cows. So the condi-

tions are just the reverse. At the time the tariff was put on the butter, we had more dairy products than we needed; at the present time, we have not what we need and we cannot produce them, and there is a tariff on them. I do not say the tariff ought to be removed entirely and perhaps it ought to be put up, but, as I said before, if butter is good for us and we cannot produce as much as we need it seems to me that we ought not to put on a protective tariff.

Mr. Shilling: Would it not seem to you that we ought to encourage the manufacture of it then?

Mr. Aderhold: The price is about high enough. I took it from your speech that the butter was stagnating because the quality was poor. If it was good it would go out to the trade

Mr. Shilling: That is true. It is the quality instead of the big amount we have on hand.

Mr. Aderhold: So long as we cannot produce as much as we need the price ought to be all right if the quality is right. The trouble is with the quality not with the tariff.

Mr. Shilling: Would you argue on the same line for other manufactured products? Of course it simply becomes a difference of political opinion, you would be a free trader and I would be a protectionist.

Mr. Aderhold: I am not for free trade but we are short of a supply that is good, so I do not think we ought to shut out that article by protective tariff if we cannot produce enough ourselves.

Mr. Green: Mr. Chairman, is it not a fact that a large amount of this butter, while we will admit it is not good butter, in cold storage, is there because the manufacturers of oleomargarine that butter is not moving as well as it ought to? There is one thing that Mr. Shilling said in regard to the tariff on butter that appealed to me. I know something about the cost of producing a pound of butter. The facts are if we take the duty off butter, which was six cents before, it would naturally have a tendency to reduce the price of butter in this country. There is no question but we can produce better butter than we have had, that we can produce good butter, but if we cut the price six cents the farmers cannot afford to produce the butter at that price considering the present prices of feed, labor, etc.

Mr. Shilling: That is right. I agree with you.

Mr. Green: I believe that we need that protection and I believe we are producing more butter today than we are consuming, because there is a substitute on the market sold at a lower price, although close to the price of butter. For instance today in Milwaukee oleomargarine is being sold for 24 cts. a pound while butter is bringing 28 cts. We have to have a price for butter so the farmer can afford to produce a pound of butter or cheese or he cannot exist.

Mr. Aderhold: That is not what I understood from what Mr. Shilling said. Mr. Shilling said that butter was stagnating because people were eating oleomargarine but that the butter was made from poor cream.

Mr. Shilling: I said it was because the product was so poor that the public was using the substitute.

Mr. Aderhold: Mr. Green said butter was stagnating because oleomargarine was being consumed. It is because butter is poor that people are eating oleomargarine. When he said we could produce all the butter we need he made a mistake, we have not cows sufficient to do it. We have not the cows in the United States to produce the butter that we need in the United States.

Mr. Hart: In Mr. Shilling's talk a few minutes ago I took it for granted that they put in twenty million pounds of butter in storage last month or the month before, and on the other hand he said there were twenty thousand tubs in one man's hands that were not good. There is twenty million pounds that went into storage that must be good. Now there is enough good butter produced. I think if we will look through our cold storage warehouses we will find we have a whole lot of cheese there that is good and yet not saleable, for the reason that there is an over production of cheese on account of high prices, and it will be the same with butter. We are to have a buttermakers' convention at La Crosse soon and I am going to have a little data there which will come up, and I think this is one of the important points that will come up.

I think we can produce milk in this country as cheaply as in Canada and when it comes to paying cold storage on butter shipped from Australia to San Francisco, the cost of

that artificial refrigeration is very small so that recently there they have been shipping in that butter. They are charging to high a price for butter in San Francisco, in fact throughout the United States, simply because the price is controlled by the larger buyers of butter and cheese in this country. We have men from Seattle buying up your cheese and butter and putting it in storage to make an increased price. They are doing this and have done it. I think if you will manage the work in some other way to get the goods out on the market, put your product before the people and sell it as quick as you make it, the public would be able to get good cheese and good butter at a reasonable price instead of putting the goods in cold storage in order to raise the price.

Mr. Wallace: I would like to ask Mr. Shilling who he thinks suffers the more, the centralizers of the local creameries from an over production of butter?

Mr. Shilling: That question to my mind is very easily answered, and I am informed that the great bulk of the butter today in storage is centralizing butter.

Mr. Wallace: Then I think it would be a good thing to have an over production and put them out of business.

The President: Now we are going to have a buttermakers' convention at La Crosse and will not convert this into a buttermakers' meeting at this time although there is always room for a certain amount of discussion. I came from Canada yesterday and we are paying thirty-five cents pound for butter in Canada, but only paying twelve cents a pound for cheese. In this country we paid 16½ cents when the Canadian market was only 10¾ cts. Who has to pay for it? If the consumer does not the people who have to handle it will pay for it, and a great many cheesemakers today in the United States are paying for a little experience they got last summer. Whether it will do any good or not I do not know but it is always possible that there are two sides to every story, and every question. The ones who are shipping cream from Ontario are pretty much from the cheese sections.

Mr. Hart: I am not as familiar with that as with shipping butter from Australia. The butter was shipped in there, as I understand it, to retailers, who formed an association. The larger wholesalers of butter were charging such an exorbitant

price that the retailers sent to Australia for butter and bought it cheaper laid down at San Francisco than they could have bought their home product, and by doing that they raised the cry of a high tariff on butter.

Regarding milk and cream shipped from Canada to this country, I believe it comes particularly from Ontario. I was through that section during the summer months and I noticed they shipped quite a little to different parts of Michigan, but I think we can produce milk and cream as cheaply in the States as in Canada. If not, I would like to ask if anyone knows why we cannot?

Mr. Aderhold: Why could not those gentlemen have sent to cold storage for butter instead of sending to Australia for butter, and in that way they could probably have gotten the butter fully as reasonable, or more so, than from Australia with the tariff attached?

Mr. Hart: According to the report which I received, they have sent throughout this country asking for prices and there was very little difference in price, by the time they had paid the freight on it. They were in the market to buy a certain amount of butter and they could buy a better quality of butter in Australia than they could on the American market. That was their decision and their action. There was the question of quality and of quantity. There was no question of the quality of butter they could purchase and market at San Francisco and Seattle at the time, it was a question of price. Then when they sent east for prices the dealers sent them prices and the scores at which the butter would score, and so they got a better product at a cheaper price than they could buy in this country.

Mr. Aderhold: Was it not partly a question of quality?

Mr. Hart: They wanted price also as much as quality. They were satisfied with the quality of butter but they found the price was too high according to the eastern markets.

Mr. Aderhold: When was that?

Mr. Hart: That was probably ninety days ago.

The President: Gentlemen, we will have to draw this morning's session to a close. Do not forget the afternoon session commences sharp at two o'clock. If we can meet sharp at two if anything of this nature comes up we can take time to discuss it. I do not like to cut off any discussion.

Mr. Hart: Before closing, Mr. Chairman, I would like to say that I did not mean to turn the cheesemakers' convention into a buttermakers' convention, because as supply men we have as much interest in the cheesemakers as in the buttermakers, but taking into consideration the cheese manufactured at the present time, the quantity of cheese in cold storage, and the price we are getting, I believe the cheese market is going down from day to day.

The Chairman: We will now adjourn until 2 o'clock this afternoon.

WEDNESDAY AFTERNOON SESSION

Meeting called to order at 2:30 o'clock by President J. B. McCready.

The President: The first on the program this afternoon is "Practical Hints to Cheesemakers" by T. A. Ubbelohde, of Glenbeulah, Wis. Mr. Ubbelohde is editor for the department of the Dairy Record published at St. Paul.

PRACTICAL HINTS TO CHEESEMAKERS.

MR. T. A. UBBELOHDE, GLENBEULAH, WIS.

Mr. Chairman, and Fellow Cheesemakers: I am not going to give you any great chunk of information; but I will try and point out where you can look for information.

I might say, to start with, to get the most benefit out of these conventions, the cheesemakers that are in need of information should ask the speaker questions in regard to making cheese. If you ask questions yourselves and become interested you will get more out of a meeting than you will by just listening to an address. That is what makes a valuable convention to you, is to take part in the proceedings yourself. There may

be some in the audience that have had practical experience this past summer on some particular thing you want to know about and they can give us the benefit of their experience. That is what we are all here for, is to get what we can.

Some of the young men here will be looking for a cheese factory next Spring if they have finished their education. Be careful about finding them. Most cheese factories are good for some men, some men will do well where others will not. Look into the disposition of the patrons before you buy because if you get into a locality where you cannot get along, the cheese factory will not be profitable to you and it will be hard to get your money out of it. Then when you get the factory settle down, do not make any arrangement with the farmers that you cannot live up to.

When we go back twenty-five years in Sheboygan county, where I live, anybody could go into a cheese factory after working two or three months, and make cheese. Some did make cheese and others made something they called cheese that had to be sold at a discount. Then the farmers insisted on the cheese being guaranteed.

If we get good milk, it is all right to guarantee the cheese, but a whole lot of the milk is bad and we cannot afford to pay for that poor milk. That is one reason why our milk is not getting better. If we have county or township clubs, such as the president spoke about this morning, we can insist on not paying for milk more than it is worth. If the farmer delivers milk that will make bad cheese, and the poor quality of cheese is traced to that milk, we should not pay for it. We should have our pay for making the cheese and the farmer should get what that milk will bring in cheese and nothing more. If we club together and insist on this, if the farmer understands if his milk is bad he is not going to get anything for it, he will take care of that milk and we will get better milk. The cheese dealers want good cheese; it is better for them to handle good goods; it is easier to get money out of a good article than to have poor stuff that will be put into the warehouse without knowing whether it will sell later or not, of course hoping it will.

As long as we guarantee to turn out a commercial cheese we may expect to get more or less poor milk. Sour milk, acid

cheese, etc.,I think the cheesemaker should be held responsible for; but when it comes to handling milk that contains yeast fermentation I think that should be charged to the farmer. I do not see why the cheesemaker should guarantee to pay market price for such milk.

The cheesemaker does not get enough for making. Some makers make for one and one-half cents. One factory alone cannot raise the price, it would lose its customers if it did, and I think it would be easier for the cheesemakers to raise the price for making if they would all join together and pay by the test instead of pooling the milk as a number of factories do. One factory pays the test, the other pools the milk, and if the latter is giving more for the milk the patrons will naturally go over there. This summer I interviewed patrons of different factories and all I saw were willing to have the cheesemakers hire a man to do the testing, using the Babcock test and the Hart casein test, the farmers to pay for this work. It would relieve the cheesemakers of considerable work and then there is no object for a farmer to go from one factory to another.

I do not think we should try to have our neighbor's patrons bring milk to us. We are not getting one-quarter of the milk that can be produced and the cheesemaker is in a position to help this along more than anybody else. Our experiment station told us what to do for the farmers that are producing the least milk and the poorest milk, and those farmers will not read a bulletin unless their attention is called to some particular part. They do not take dairy papers or read them unless there is some particular subject to which their attention is drawn. The cheesemaker is the man that comes in contact with them. He can get them interested in these things in such a way as will benefit themselves. Unless the patrons become interested and gradually work up to it there will be no good results. It will not do you any good at the schools to be told how to make cheese unless you have a chance to try making cheese yourself, but you can produce more more milk and better milk if the cheesemakers will look to that point. I believe we could all increase our business considerably every year if we tried to do it in that way.

Then the sanitary conditions around the barns are not what they should be in our county, although Mr. Aderhold has done a great deal. He has talked a great deal to us, in fact there

is nothing that has done as much good for the factories as the dairy and food inspectors. The outside of the barns, the barn yards and the barns themselves are in a very bad condition in many places in the spring. When the yards dry up the cows come up and lie down in them and then if you take a piece of white paper and hold it under the cow, no matter how clean you may think her, in a few minutes you will see that paper covered with dirt. I really believe that a cow that accumulates dirt is worse for carrying germs than the cow that is nasty and is washed. Those little particles are dry and the farmers do not notice them so the germs get into the milk, and as soon as they get into the warm milk they get busy and by the time the milk gets to the factory they are in condition and numbers to make trouble, and nothing but a good active starter will help things.

The starter usually is not what it should be. I saw a starter in a factory this morning that was pretty near alive. Perhaps Mr. McCready has bought cheese that was started in that way. I was in a warehouse at Plymouth not long ago and the dealer told me that he did not receive one shipment that did not contain some cheese that had to be cut on price. Somebody had to lose money, but I hope the cheesemaker will not lose it all.

The barnyards, we should all talk to our patrons to haul the excrement from the barn to the field. It increases the fertilizing value of the soil so it can produce more and you do not have to bother with the excrement next summer when the cows are in the barnyard. I have found that more trouble is caused from the barnyard than from any other source. At a certain factory, the cheesemaker told me there was something wrong with the cows. He went to the barn and took samples of the milk and the milk showed "pin holey" with the curd test. I asked him about this, whether he had tried carefully wiping the dirt off the flanks and putting this in the milk and testing it. He did not know whether this condition of the milk was caused from the dirt on the outside or whether it was something in the milk. A few days afterwards I went to the barn and milked the cows myself, rubbed the dirt off them carefully but there was so little you could scarcely see it, but I put this dirt in the milk; then we carefully washed the cows, scrubbed them and milked, and the milk showed up all right, while the milk

drawn before the cows were cleaned showed pin holes. That convinced me that it was the dirt on the cow that was responsible for the trouble with the milk.

Now the centralizers are coming in, not exactly the centralizers but the condensaries. That is another reason why we should insist on the farmer producing more milk, so as to supply the cities and leave enough milk for our cheese factories. The condensors will take all there is when they do come in. I think we could overcome this to a certain extent by having the farmers feed the whey in such a way that they would realize the feeding value of it. Whey is a valuable feed for hogs and it is a valuable fertilizer. We had a field on our farm two years ago that we fenced off, on one half kept cows and on the other half kept hogs, we had about twenty hogs to two and a half acres. These hogs we fed whey and a little milk. The next year we plowed up the field and moved the fence, and on the half where the cows were we gave a good top dressing, disced it in. On the side the hogs were we planted corn and the ears were fully one-third more where the hogs had run than on the other side, the stalks grew up fourteen feet high. It was a good piece of ground. The fertilizing value on that ground was fully as much as the feeding value of the whey. This year the barley grown on that field produced double the grain on the corner where the hogs had been. Now if we can get the farmers to first learn that hogs run to pasture and realize the feeding value of whey, also the fertilizing value, I think it will help us when we come to fight the condensors and we will have to fight them sooner or later.

The thing I am most interested in now is the testing. I think we ought to quit the pooling business and test the milk, paying by the test. Neighboring factories will get along better than where one man pays by the test another by the pooling system; trying to get each other business makes it unpleasant for the factories and the farmers do not get what belongs to them. We have tests that are simple and efficient and I think we ought to use them. I thank you for your attention.

DISCUSSION.

The President: Now Gentlemen, Mr. Ubbelohde brought out some good points. He can perhaps bring out more by asking him questions. I am sure he will try and answer any you may ask. As I said this morning, start something, if it is only a row. You can get a good deal of information.

Member: I would like to ask Mr. Ubbelohde about the casein test. We use it and only take samples three days out of a month, but I do not think that is quite square. There should be a way of taking samples every day for the casein test.

Mr. Ubbelohde: I cannot say as to whether that is necessary or not but where we have conducted the test two or three times a month we have not let the farmers know when that testing was to be done. If the cheesemakers would take samples two or three times a month and do the testing at that time, not letting the patrons know when the testing was to be done. I understand they take composite samples. If you have a good cool curing room they should not be kept over seven days, but there are many curing rooms that would be all right while others would not. Up in our section we take samples and test them the same day, testing the milk two or three times a month.

Question: How would you avoid letting the patrons know when you take the samples?

Mr. Ubbelohde: It is all right to let them know when you take the samples but not before. What we are getting at is there would be no chance to skim or water the milk. We take a test of the night and morning milk and not take a composite sample. That is what we have talked of doing but whether it can be done or not I do not know.

Mr. Aderhold: Is there not a way of testing composite samples? Saving composite samples and testing for fat and casein out of every sample? Is there any dairy student here who knows about that?

The President: How about that Mr. Schwingel?

Mr. Schwingel: The subject we are discussing is very important and I do not see any reason for taking the sample two or three times a month when it is possible to make a composite sample. By using a test it is possible to use a certain portion

and make a composite sample of the milk. A sample can be tested once a week and excellent results can be obtained.

The President: Take the samples in the same way as you do in testing for fat, use about the same per cent of potash?

Mr. Schwingel: Yes, use the same test for both. All it requires is five cubic centimeter for each sample for the casein test.

The President: Any other questions?

Member: I would like to tell this gentleman here about my using the casein test for the last two years. I have always taken three days' milk out of a month and tested it. In testing for butter fat we take our own samples, and for testing for casein we take an extra sample three days, but I do not gree with him because butter fat test out of this sample does not show the same as by using the other method.

Dr. J. L. Sammis: I believe it is pretty certain, if we are very careful about taking a sample so as to get a good sample, that it does not make any difference whether you use the bichromade or corrosive sublimate for the Babcock test, but for the casein test, you have to use the bichromade. By using the bichromade, you can take a composite sample every day for a week if you desire, and test at the end of the week.

The President: As I understand the gentleman, he would take a separate sample for his casein test from that of his fat test and perserve both samples. If the sample is mixed thoroughly for the fat test, you can get the same results for the casein test.

Member: For the last two years I have used that test and I have tested for butter fat every two weeks and for casein once a month. We take three days sample and it always worked all right but we used a different tablet.

Dr. Sammis: I would suggest that we had two or three other people that have had trouble in getting this fat test when they used corrosive sublimate on one hand and bichromade on the other. If you happen to get a different test when you use the bichromade bottle, than when you use the corrosive sublimate, the real reason I believe is because you do not get as good a sample. I just suggest this because I believe that is the cause of it.

The President: Are there any others that have had any difficulty? Are there any other questions you would like to ask Mr. Ubbelohde?

Mr. Aderhold: Mr. Ubbelohde spoke about increasing the production of milk. He did not say anything about the silo. How about the silo as a help to producing milk?

Mr. Ubbelohde: We need silos to do this. They are absolutely necessary. Our cows are giving as much milk now on silage. We are short of clover and alfalfa hay. Those are almost a necessity for winter dairying, but we are short this year, did not have rain and only one good crop. This year we have silage and corn stalks. Corn stalks are no better than timothy hay. We are feeding light on grain and still our cows are giving as much as they did on the best pasture we had last year when on full pasture. We feed our cows at full flow perhaps about 35 lbs. of silage and this silage is as near perfect as can be got and it is cheap. The year before I had twice the corn yield that I had this year but we failed to get our silage. We had a big silo built but the mason failed to get it plastered in time, so we had to harvest our corn and we had twice the feed, but did not get nearly as much milk and we fed fully twice as much as we are feeding now. Then the storage room of a silo is cheaper as we can get so much more in it. We take care of the corn, the silo is filled in a day, no husking of corn.

Mr. Wallace: Do you not think the more silage, the more winter dairying, the more poor cheese and butter we will have on the market?

Mr. Ubbelohde: No I think not. We have never had any difficulty with our winter cheese. In our section there has always been more poor summer cheese than winter cheese. I do not see why, if cows freshen in the fall, the milk should not be just as good as when they freshen in the spring. We have not the dust and dirt flying in the winter, and no chance for it to get into the milk. The greatest danger of germs getting in the milk is from dust flying continuously. The trouble is not with the feed. I believe that 95% of this trouble comes from the outside and not from what a cow eats. If a cow eats turnips, rape, etc., you will smell the milk. I do not advocate feeding anything like that but good clean silage will produce good milk. I made cheese from it seven or eight years ago. About all the winter milk we get comes from silage and we have averaged a better flavored cheese during the winter months than during the summer. Until the last few years we sent our cheese to the monthly

scoring contest and our winter score was fully up to the summer score on those cheese. If there is any trouble it is due to carelessness in taking care of the milk.

Mr. Aderhold: Suppose the cows are filthy and the stable smells bad, could you get good milk?

Mr. Ubbelodhe: No sir. Our farmers should be jacked up on the ventilation. If the barn smells sweet and clean you will get good milk, but when the barn smells musty and filthy you cannot have good milk. Farmers in my neighborhood tell me cows have to go out doors to get fresh air. It is cheaper to put fresh air in the barns and keep the cows where it is not freezing. We have some people who turn out their cows in the morning to get fresh air. It is cheaper to furnish them with air than to turn the cows out in the cold.

Mr. Wallace: When your factory operates every other day where will you keep the milk?

Mr. Ubbelohde: Our milk is kept in a storm basement built directly off from our barn, but we believe the milk can be kept in the barn and be all right. We have plenty of intake flues; we have an outtake flue two feet square for eighteen head of stock. We have large windows, one third of our east and south side of our barn is light, and we have our cows facing the east so that the sun shines on them. It is not quite as convenient for us to feed them but I like to have the cows in the sun. Sometimes we do not turn our cows out for a week. They are turned loose every day and watered in the barn. We have a driveway back of us where they walk up and down and drink. When the weather is fair we turn them out but there has not been more than one day this winter when we closed the outtake flue. It has never frozen in that barn. The stable is nine feet in the clear. It is 36 x 48 feet. Calves and all we have eighteen head of stock and it is just as sweet in that barn as in our living room. There is plenty of ventilation but it does not freeze. We cannot make good cheese or butter if the barns are dirty. The cheesemaker is the man to get after this. The dairy inspector has a big field to work and cannot go here, there and everywhere. If he comes to a place today we do not look for him again for a month but if the cheesemakers try they can relieve the inspectors.

Mr. Scott: A number of years ago Hon. John Luchsinger, of Monroe, gave us an address on different cheese and the places

where they were made. Swiss cheese was made on the hill and in this country there are certain territories in Wisconsin where they make American cheese, brick cheese and limburger cheese, every section has its own peculiarities for producing these. He said in one county was the ideal place for making American cheese and that section produced good flavor, the cheese was all made in the summer time. Looking back at that lecture and from my own experience, I do not believe any man can make as fine a cheese in the winter on silage or any other food as he can in the summer on good grass milk. Conditions have changed somewhat, it used to be June and now it is getting to be October when we get a fine cheese. I do not believe we can get clean flavored cheese in winter. No man can get as fine flavored cheese in winter as in summer.

The President: I quite agree with Mr. Scott. I do not think as good winter cheese is made. If it is as good I do not understand why winter cheese would not bring more than within four or five cents of what a summer cheese would bring. You may say cheese made in January will score 100 points but take a look at it in summer and compare it with the cheese put away in May or June. I never saw flavor in winter cheese, there is absolutely no flavor to it, and while it may be a fact that we will get along without any trouble with our winter cheese, the cheese buyers are to blame for it because we give them to our trade and the trade takes them because they do not know anything better, but the time is coming when they will. You cannot sell an old country man a cheese made after the first of November, he would send it back. If a Canadian factory opens before the first of May it will have to sell its output before the first of May to the patrons.

Mr. Aderhold: There are a number of different factors that influence the quality of milk in the winter. In the first place it has been the case that the majority of the cows are strippers in the winter time and we get the best flavored milk from cows that are rather on the fresh side. In the second place, most of the cows have been fed on dry feed in the winter time, which is an unnatural food for cattle. In the third place, very much of the milk has been produced in stables that smell more or less and you know the stable air is carried into the milk. The streams of milk that go from the cow into the pail of milk

carries the stable air with it into the milk and it comes up in thousands of fine bubbles. That stable air is driven through the milk abundantly and if it has a bad odor there are a lot of impurities in the milk that must be contaminating. It is impossible to get good milk in a stable full of bad odors, or clean milk from a filthy cow. All our winter smell is more or less contaminated because some of the cows are filthy. I believe if the majority of the cows were fresh and we had sanitary, well ventilated stables and cows as clean as we like to have our horses and we had silage to feed in place of all dry feed, we could produce pretty good milk in the winter and pretty good cheese if we made it up every day.

The President: It is a real fact that with the best milk we can produce in the winter our factories are not in condition to make a good cheese.

Mr. Ubbelohde: In regard to pasty cheese, one of the causes of pasty cheese is the milk is frozen perhaps before it comes, and the acid in the milk does not develop. That is just as necessary in winter cheese as summer cheese. We do not want sour cheese but lactic acid is necessary in summer as well as winter to make a cheese. We can have milk come in the winter three hours later than in the summer and then have the cheese on the hoop as early as in the summer. It takes a certain time to turn out a cheese. We cannot make good cheese out of sour milk or good cheese out of frozen milk. You have to meet conditions in the winter the same as in the summer. There is no need of having pasty cheese in the winter, but what we want is to have cows freshen early in the fall, having fresh milk in the winter to secure more in the winter and have less in the summer. Then there is more profit in it for the farmer and he has more time to take care of the milk, but he has to have his stables in condition to do it.

Mr. Wallace: Why not have the cows freshen in the spring and feed silage in the summer when the pastures are short, and let the cows rest in the winter.

Mr. Ubbelohde: That is all right, that is what we do. We should have silage last the year round where land is high and pastures scarce. Every year, with one exception, since I have made cheese, pasture has been short with us. That one exception was a year that we had rain. It was dry in the spring

but after that there was plenty of rain. Every year pastures are rather short in our section during the latter part of the season and every farmer that has a silo keeps silage to feed at that time, and it certainly is a good thing to have.

Mr. Aderhold: Do you think farmers can afford to keep cows twelve months and only milk them six months?

Mr. Ubbelodhe: A farmer told me this past week that he had to feed his cows 11½ months and that he could not afford to do that. I told him we fed 11½ months in the aggregate, that we only depended on pasture two weeks, and we think feeding is cheaper.

Mr. Aderhold: You said you thought the cheesemaker was getting too low a price. What do you think the cheesemaker should get for making?

Mr. Ubbelohde: For twins they ought to get one and three-quarters cents to two cents, and for the smaller cheese they should have at least one quarter of a cent more. Two cents on the average is scarcely enough for making. We have to pay a big price for boxes, and they are going up, and everything else is high in proportion. So long as cheese is sold where it is there is no reason why the cheesemaker should not have something out of it. I figure this from the standard of the farmer, from my own dairy, and also from the cheesemaker's side of the question, and I believe the cheesemaker does not get a high enough price to turn out good cheese. A higher price will allow the makers to stay in the business, we will get better cheese and can afford to have better factories. There is not a factory in the country but needs a number of improvements and it takes money to make them, so the most of the cheesemakers cannot afford to make those improvements.

Mr. Wallace: What is the cost of producing a pound of cheese, not taking into account any profit?

Mr. Ubbelohde: It costs a little over one cent to make a pound of cheese, probably about one and one-eighth cents.

Mr. Aderhold: Do you figure labor and investment?

Mr. Ubbelohde: No sir; that is without interest on the investment. I have figured that as carefully as I could and find it costs about one and one-eighth cents. That does not include wear and tear, just the actual expense including such

repairs as would come up during the season. That does not include labor. What is over that is all the cheesemaker gets for his labor.

Mr. Aderhold: Cheesemakers never figure all it costs them to do that.

Mr. Bruhn: There has been quite a little said about lactation. Has it been proven that lactation has anything to do with the flavor?

Mr. Ubbelohde: I cannot answer that.

Member: I believe that we are doing very well. We have improved a good deal in our cheese industry in making cheese during the winter. We have our cheesemakers trained to a point where they make in winter time, I will not say as good a cheese, but a very fine cheese; and I believe if we come to a point where we all have silage and have clean feed and well ventilated stables, that we can make cheese as well in winter as in summer, and that will not only give us a chance to make money all the year round from our cows but I believe it will overcome the market situation which we have. Where we make cheese only during the summer season we have a great speculation in our cheese. Our big cheese buyers buy the cheese during the summer, put it in cold storage and after they get all of it, with no cheese produced during the winter, the consumer can look for a big price.

The President: It improves the cheese to be in cold storage. You would probably find plenty of dealers this year that would sell you back some of that cheese for two cents less than they paid for it.

Member: If we got cheese during the winter the cheese would have to be sold for the regular market price.

The President: It is a funny thing that we spend so much time discussing something which concerns us very little at the present time and overlooking a point which does concern you all. There is not enough winter cheese made to worry about. I have never shied at a raise in wages in my life, but I believe there are cheesemakers this winter that cannot afford to come to this convention. Some of you might better be working on the road, I want to tell you I would think a whole lot more of the cheesemakers of Wisconsin if they were getting what their services are worth, we would have more

good cheesemakers. Don't you think it possible for the cheesemakers of Wisconsin to raise the price of making cheese? There are eighteen hundred cheese factories in this state. Let each man in those factories walk out some morning and say "Our price today is two cents a pound for making" and I will wager they will not import scab labor to take your place. I am not an agitator and do not want to organize a trade union, but I will make another bet, and that is, that I could raise the price of making cheese in this country in ten days.

Member: I will agree with you in that and I do not think the cheesemakers can guarantee this make. He should make the patrons bring enough clean milk so as to get a price for his cheese without guaranteeing it. I think he could soon train his patrons so as to make good cheese all the year round.

The President: I think it is a fact that all good cheesemakers get good milk but that is because they are good cheesemakers and if the position paid better I think we would find more good cheesemakers in the business.

Mr. Wallace: I would like to have you outline your plan of raising the cheesemakers' wages or earings. I am interested in that. I want to get the raise.

The President: If each cheesemaker in the territory agreed on a certain scale of prices for making cheese. You can bind a man to live up to his agreement, you can either do that or make him a quitter. I think it would be to your interest to abide by your agreement. The local men in your vicinity should have one scale and adhere to it. If you get together you can do it all right, but if you are jealous or suspicious of one another of course you cannot accomplish anything.

Mr. Walace: Do you realize that the large factory can make cheese for less money than the small factory and that there is a difference in the wage scale at the present time? How are you going to get those fellows that have the best of it now make for the same wages we are making?

The President: You cannot make a difference in scale for the large or small factory. The best scale you have now is not good enough for the best of your factories and it can be brought up. Go out and ask the iron workers or steel workers or any of the other fellows how they put up their wages?

Mr. Scott: The steel workers work by the hour, or by the

day, while the cheese factories in Wisconsin are owned by the makers themselves, who is not working for wages. He is a business man. I think you are a members of the Cheese Buyers' Association. I have heard that they came to Milwaukee and made an agreement not to contract cheese. A member of the association went out and telegraphed to his employees to contract for all the cheese they could get. I do not believe the cheesemakers are any better than the cheese buyers.

The President: I was not in on that deal.

Mr. Scott: We want all we can get. In my section haulers are reaching out in Sheboygan county for milk. Men on the road are canvassing my patrons to get them to ship their milk to Milwaukee. If you ask a farmer how much he is paid for milk he will tell you. They do not ask how much you are paid for making a pound of cheese but how much is the cheesemaker paying for the milk by the hundred pounds. The farmer does not care whether you get one cent or four cents if you give him as much for his milk as he gets somewhere else, and if you do not pay as much he is going where he gets more.

The President: If you were making for one-half cent a pound would it not be possible for the Milwaukee dealers to offer more money than you can?

Mr. Scott: They will not.

The President: You wait until the condenseries get in close enough, and you will find out they will agree to pay so much above the highest price paid in your section. Do you think the cheesemakers are being paid enough?

Mr. Scott: One and three-quarters cents a pound for making Daisy cheese is enough, yes.

The President: There are a whole lot of cheesemakers only getting one and one-half to one and a quarter cents.

Mr. Scott: That is their own fault. The greatest trouble today is that so many cheesemakers cannot come to conventions, meet in competition with other men. At a convention of this sort you meet men and exchange ideas.

Mr. Wallace: I think the proper method of raising the price of making and get paid for what the cheesemakers do, is to get circulars out and educate the farmers to the fact that they cannot get something for nothing.

The President: That is an education that has been going on for a long time but it does not stop there.

Mr. Ubbelohde: The farmers are not so much opposed to paying more for making their cheese if all the factories would agree on that, but one factory cannot change. If we could reach out and all insist on having two cents for the average cheese, you will not find the farmers opposed to it; but here is one factory that makes for one and one-half cents and there is a lot of "kicking" if the other factory charges two cents. If the cheesemakers all insist on two cents there would be no trouble in that line, and the farmers would not send their milk to Milwaukee. The difference is not so much to the farmer but the trouble is that some cheesemaker makes it for less. We can have two cents if all the factories say so. I have talked with the farmers in nearly every factory in our township this summer and they have all agreed to pay two cents if the factory charged it. It is simply a matter of the cheesemakers getting educated.

Mr. Wallace: What would be the objection to keeping the whey at home and skimming the whey?

Mr. Ubbelohde: If the cheesemakers think they can make up on that, they can do it but I prefer to have the farmers know exactly what I am doing. I think when the time comes to fight the condensaries if the farmers have confidence in the cheesemaker he will have a better chance to hold them. I never believe in taking any roundabout way with the farmer, found it better to keep him fully posted on what I am doing. I want everyone interested in what I am doing and know just what we are getting. If the cheesemaker thinks he can do better by skimming the whey it might be all right.

Member: I believe the whole trouble with our cheesemakers is that one man is trying to beat the other one. Just as soon as you build up your factory you have to have the price to make the cheese or you cannot make it up. There are many factories today struggling along in a little shack. In the summer they are baked and in the winter they are frozen, and we must raise the price of making or we cannot exist.

Mr. Aderhold: Another thing, there is many a cheesemaker that has not a decent dwelling house in which to live. I know of men who have made making cheese their life business, and have lived over the factory raising their family there.

Mr. Ubbelohde: We have a factory in our town, one of the first factories there. Mr. Aderhold was there two years ago. Sometimes that factory has run up to perhaps twice the milk that any other factory in the town had. It has run for thirty-five years, and now while some of our factories are getting twelve, fourteen and fifteen thousand pounds of milk, this factory has had two thousand pounds of milk, and part of the time he made for less than any of the other factories. There is something else besides the price of making when a factory loses patrons. A man should get enough for making so he can have camfortable quarters in which to live and if he is a business man he ought to have something for his labors. The cheesemaking business is one of the greatest fields to work in there is. It is a far greater field than that of the lawyer or doctor if we get all there is in it. The farmer perhaps has a larger field but there is no other field ahead of him. If a man does business he should be paid for it.

Member: I would like to ask how we can come together and combine to do this. One man says we can afford to make for one and one-quarter cents the next man gets one and three-quarter cents and cannot make his living. I believe the man that makes for one and one-quarter or one and one-half cents will have to beat the farmers some way to make his living.

The President: I have no solution to offer on this problem, no more than this, if I were making $1.50 a day and believed I were worth $2.00 in my line of business, I would get that $2.00 or get into some other line of business and I would not starve because someone else was going to beat me at my game. I would go into another game. If the forty cheesemakers in a county get together and say "We will have two cents for making cheese" they will get it. There may be a few men satsified with what they are getting but I have never met that kind of man. If you do not want any more money go after it anyway for your family's sake. A man with a small factory making for one and one-half cents a pound is not making good wages, and when he has to lay idle part of the winter it would be better for him to get out of the business as fast as possible and go into something else. If forty men cannot agree to raise the price I have no solution to offer, but I believe you could get together and put this question of raising the price to the farmers in the right way, put it on a sliding scale if you

so desire,—so much when cheese is selling for 16½ cts., and so much when it is selling at nine cents. Those men can also recommend cheesemakers to new factories that may be started. If you organize a few county associations you will find you have done something, at any rate.

Mr. Marty: I do not see any reason why the American cheesemakers cannot work on the same basis as the Swiss cheesemakers who work on a percentage. If they get fifteen cents for their cheese they get 12 per cent. commission, so if they get 16 cts. you can readily see they will get a greater amount of percentage.

The Chairman: We may have another opportunity to discuss this at some other session but we have no more time for discussion at present. I will now call on Dr. J. L. Sammis, of Madison, Wis., who will talk to us on Improvement in Cheesemaking.

THE IMPROVEMENT OF CHEESE MAKING.

DR. J. L. SAMMIS

Asst. Professor of Dairy Husbandry, University of Wisconsin, Madison, Wis.

Mr. President, Ladies and Gentlemen: I see the boys from the dairy school have brought their voices with them, we hear from them once in a while. I hope they will get in the habit of using them one at a time so we will hear from them separately before they get away from this convention.

The object of your association is to improve cheese making. When I see how much you are interested in this subject, how much you have been talking about it, it reminds me of an old story about a cheesemaker who went to a convention and left his helper at home to do the work. He remained all during the convention but he sent word by one of the neighbors as to some

directions home. He said to the neighbor, "You go home and if you please go into my factory and see what Jim is doing and then you tell him to go ahead." Now when I come down here and see what you are doing, I feel more than anything else like telling you to go ahead on this matter of improvement because I see you are all interested in it. I did not know whether I would be able to get over here or not, but I made some notes here on a few things about which I want to talk to you.

In the first place, I think you ought to be proud of this association, an association with a record of nineteen years behind it, nineteen years of improvement and with the number present at this exhibition, an association that can offer such a display as this is something to be proud of. The things that are close to us do not seem so very big but as years go by the history of this association will be a big thing, in fact the past history is a big thing in relation to cheese making in Wisconsin. I believe that every factory owner, when he hires a cheesemaker, might very well first ask that man, "Are you a member of the cheesemakers' Association?" Do you go every year to the conventions or do you send cheese to the conventions, or to the scoring exhibitions? Or in other words, are you still trying to improve your work as a cheesemaker?" I want to say a word to these young men from the dairy school. They have come down here for the first time to attend the convention and join the association. I hope they will make up their minds to come every year and to make some improvement every year, find something new every year, make a business of it. If you do not succeed don't feel disappointed about it; if you do not notice some improvement in your work every year, make it an aim to do that.

How can we improve the cheese industry? The subject is the improvement of cheese making. How can we do that? Where can we get suggestions as to how this improvement can be made? First, who are to consider the improvement of the whole industry in the state? The cheese industry includes not only the cheesemakers but the farmers. You will remember that some years ago there were no cheesemakers but the farmers, the farmers themselves were the cheesemakers, they made all the cheese. Then a little later the co-operative system started, but unless the farmers are interested to improve milk, unless

the farmers are making money from the milk they will not be interested to keep it up, they will want to quit it sooner or later and go into something else, and everything the cheesemaker can do to help the farmer make more money to keep him satisfied with producing milk, everything that can be done will help the cheese industry. So I say the first thing I want you to digest is that you should study how you can help the farmer. If it is a good thing for the farmer to have twenty cows, to pick out of those cows which are the good ones and which the poor ones, getting rid of the poor ones, then we ought to know that and encourage him to do that. If he needs a Babcock tester on the farm to help him select the poor cows, then the cheesemaker should help him see that. If the farmer is going to be better off by having the casein test in the factory, if the farmer who deserves the best price for his milk is going to get a good price for it, then you ought to see that and tell the farmer so. Anything that will help the farmer make more money will help the cheese factory and the cheesemaker as well.

In the second place, how can we improve conditions in the cheese factories in the state of Wisconsin? If we look back into the history of cheese making we will find that great improvements have been made as time passed, there have been marked improvements made. Away back sixty years ago the co-operative factory system started up and that was a new thing. That was a tremendous improvement over the old farm system of making cheese. Then you will remember twenty years ago the Babcock test came out, and pretty nearly everybody, or at least a great proportion of the cheesemakers in Wisconsin, know that is a great improvement over the old pooling system. How did these improvements come to be started? That is what we want you to know about because if you see how these improvements got started you can see how to make further improvements. Those improvements, the Babcock test, curd test and sediment test, and all those things did not come by chance. Every improvement had its start when some man was so interested in making an improvement, when he felt the need of that improvement over everything else. For example, in 1851, a Jesse Williams started the first co-operative factory. He saw the faults of the old farm system, he was the best cheesemaker in the neighborhood; he got seven cents a pound for his cheese and

nobody else got over five or six cents. He felt that his neighbors ought to get more money for their make and he said, "It is a fault in the system that they cannot do it and we will improve it. The only way is for the best cheesemakers to make all the cheese, and have the poor ones go out of the business." That is what Williams thought sixty years ago; so he set out being the best cheesemaker to make chees for the neighbors. He got his sons and neighbors to bring in the milk. It was a lot of hard work for him to put it in vats and make cheese for the neighbors, but he was willing to do it for the sake of improvement.

How did the Babcock test get started? Because Dr. Babcock and others felt strongly the need of every dairyman for a test for betterment of the milk, and so Babcock and the other men spent years of time and hard work trying to find such a test.

Now I say improvement in present conditions and in the future are going to be made by the men who pick out something that needs improvement. They will study the point and then will work at it and stick to it if it takes several years in order to make the improvement, not work at everything at once, pick out one thing and that will take several years to improve in all probability. We must look for the weak places in the present system of cheesemaking. We must look for the weak places in our own factory work. The poorest work done in our factories, although one of the most important, is the making of the starter. We ought to go and locate that. Say that is the weak thing that we will improve there and make every effort to find out how to improve it. We are going to have a talk by Professor Hastings about the making of starters. Read all the papers and books, send for bulletins, but stick to that subject of learning how to make a good starter. Read everything you can find and after a while you will know how to make a starter as well as to do any other particular thing in the factory work.

The cheese industry in Wisconsin is worth about twenty-four million dollars a year. That is the value of the product from the latest reports. That is about eighty thousand dollars a day. That is a pretty good big business, and while cheesemaking has been growing there have been other industries growing,—the packing industry and the iron and steel industry. I know steel works that make these steel bridges that rise like a jack knife

over the river. They have been growing at the same time the cheese industry has been growing, as have a lot others. Now is there anything we can learn by studying these others which will help us in the cheese business? If we can find something useful from a packing house business that will help us in the cheese business then we ought to do that. Let us for a moment imagine, that we are in Chicago, and have gone into one of those packing houses at the stockyards and have asked for a guide to explain things. We will find there are different kinds of work to be done; there is the work of the buyers, buying sheep, cattle and hogs out in the yards. There is another kind of work for the men who slaughter those animals, clean them up and get the various products ready. They have a different set of men for that. Then on the road there is the set of salesmen that travel around and get rid of the product, another set of men doing different work. Then there are the bookkeepers, and the men they have to test the product and see that it is perfect before they send it out, in the laboratory they are making tests. There are all those different kinds of work going on in the factory at once. Then you ask if that is all. No there is some one man in the packing house, there is someone special in that big business whose work is more important than the work of any one man there, that is the manager. That is a more responsible position, carries greater responsibility than any other one position. He draws a bigger salary than any other man. Now I want to ask what is the work of a manager which makes him so much more important than anybody else. What part of the manager's work is so important that he gets more than anybody else for doing it? You know what the manager does. As long as things are working along smoothly the manager is happy and satisfied. Then perhaps he can take a vacation, but if any trouble arises, if something has not been done correctly, the manager is the man that sets that right. He says "You men must stop doing this and you must go over and do that. You cannot do that any more, we are losing money by it." The manager is the man that manages this most important part of the business. You will find a manager in every big business. All those big stores in Milwaukee and Chicago have managers at the head of them. At a cheese factory what do you find? There is one man in the cheese factory and he does the buying; there

is plenty of work to be done, lots of different kinds of work to be done, taking in the milk, weighing and inspecting it; then the same man makes the milk into cheese, most of them go to the board on Saturday and sells the cheese. Then he keeps the books, the same man. Who does the managing, the same man. If the work of the manager is the most important in the steel works and in the big packing houses and in the big stores, then the work of the manager is the most important in the cheese factory and the cheesemaker ought to give a certain amount of his time for doing the work of the manager, that is the looking for things that are going wrong, looking for things that need improving. The manager is looking for something that should be improved, he takes it for granted that there is part of the work that can be improved and he is the man to look for it and ascertain some method for improving it. I think the cheesemaker should pay a little more attention often to the work of the manager, and to the factory that he has to manage, and the duty of the manager is to look for weak points and improve them all the time, every day in the year.

Now when you go to looking for weak points in the factory:— I have been talking to a number of men here and have asked them what are the weak points in their factory, where is the waste, and where the most need of improvement. Some will say it is the starter that gives them so much trouble and that they cannot get a good starter in shape; other men will say "The kind of milk we get is very bad," and we cannot correct it." There must be a great many other things. Now there is the thing to get to work at, not being content as it is, not being content with seeing that a certain thing ought to be improved, but stick to it if you can only put in fifteen minutes in the day in studying and thinking of the work, of how to improve the quality of the milk that comes in, let us put in at least five minutes a day thinking of it and it will come. It will be done as time goes on. Let us begin and do our share.

In improving the quality of the milk, we have heard for a great while that the Wisconsin curd test was a great help. I do not suppose there is a man here that has not heard about the Wisconsin curd test or read about it, but I venture to say there are a few men here who never used the Wisconsin curd test, a few men here who know how to make it and a few men

here who would not know how to make it if they wanted to. It is said the Wisconsin curd test will help us very much in improving the quality of our milk. Then we should find out how it is made so we can use it any time we want to. What does a curd test do (I am only using that as an example). The curd test will help pick out the farmers that bring poor milk. Second, it will give you something that you can show to the farmer. Say "This test shows the curd, here is another milk, you can see the difference." You could use the fermentation test for the same purpose and sometimes it is necessary to get the farmer to make a fermentation test at home personally. Set a glass of milk in a warm place and let it sour and see whether it makes a brittle curd that goes to the top of a nice smooth curd that fills the tumbler. That will show him something. Perhaps you can get him to do that. Another test you can use is a sediment test. It takes about a minute to furnish the sediment test. You can show a man before he gets away how much dirt there is in his milk.

There are a great many questions arising at a cheese factory that a cheesemaker can learn by asking his neighbors, or that he will hear about at a convention of this character. Then there are other questions that are a good deal harder to answer. For instance, sometimes the cheesemaker will ask whether he will get a bigger yield of cheese by following one method or make or by following another method. That is sometimes a hard question to answer correctly. The best way we can do is to take a vat of milk, divide it into two vats and weigh the milk out separate in small vats, then make one vat of cheese according to one method and another by another method. Then you have the same kind of milk but would make the cheese out of two vats and in that way find out which gave the bigger cheese. But the cheesemaker has not time to do this. He has no time to make experiments along with his regular work of making cheese, and that is true, but that is being done at the dairy school at Madison. Anybody is welcome to write asking any questions of the dairy school because the instructors are glad to give out any information that is available at any time. The number of instructors there, I think, if they do not know they will tell you and not try to deceive you.

There are some other things. About fifty years ago a man

in France, by the name of Pasteur discovered that we had little germs in milk that made it get sour, discovered the bacteria under the microscope. At the same time he invented a method for killing those germs and we call that method pasteurization. You know that while pasteurization is used a good deal in city milk supplies to improve the quality of the milk as delivered and is used by creameries to improve the quality of cream so as to get better butter, it is never used in the cheese factories because nobody has yet been able to make good Cheddar cheese out of good pasteurized milk. To be sure they make some kind of cheese in Europe, make it in Denmark, but nobody has yet recommended any method for making American cheese out of pasteurized milk, and yet it would seem if that could be done it would be a great improvement.

What kind of cheese may we expect to get out of pasteurized milk? We may hope to get rid of the tenants that may be present in unpasteurized milk; we may hope to overcome the acid of the over ripe milk, we will kill the bacteria in over-ripe milk and stop their action; we may expect to kill the gas germs in poor milk. If we would kill their bacterial action in poor milk, then put in a starter and make cheese, that would appear to be a good thing. The experiment stations here and in Canada have tried that a number of years. We have not succeeded at Madison but we are working at it hard and prospects look hopeful.

Now I want to say, in closing, that we can help, every one of us can help, improve the cheese industry in Wisconsin, that is, by scattering the information we have already; be willing to tell the next man the best you know about the cheese industry for the sake of the whole industry, for the sake of the Wisconsin cheese. In the next place, help the farmers in your neighborhood to improve; if you can help them make more money they will better support the cheese factories. If you can get the farmers all over the state to furnish milk there will not be so many cheese factories on the verge of starvation, as we might say. If every farmer was making more money than he has done heretofore he would be inclined to have twice as many cows right away. In the third place, let us all go to work hunting for the weak places in our own factory, to hunt for the faults, we do not need to advertize them to other people, but we should not say to ourselves: there are no faults, because

there are always places that can be improved. You know that. Let us hunt for that part of our factory we consider the weakest and set out to improve that. Read the dairy papers, talk to your neighbors, come to the conventions, go to the members of the dairy and food commission for information. You will then be able to find out about that weak point and bring it up to the standard.

Now there may be some men who think that a thing is in such good shape there is nothing to improve, but I want to point out that even if that were true there would still be work they could do for the rest of us. You know every year the machinery that is used in cheese making is improved. We have improved the curd knife and the apparatus for distributing whey. A great many of those things have been gotten out by cheesemakers, men who have had opportunity to use every day an agitator, and after a good while they made up their minds they could improve that and make it better. So I say if you have nothing else to do, which I do not believe, you can begin to study some part of the machinery you are using and try to improve that for the sake of the industry.

A good many of you are interested in the casein test. Who does the casein test concern? I am using this as an example of a lot of improvements. Which one of the people in the factory does the casein test interest the most? Now what do you want to know about the casein test? What do you want to know about the Babcock test, why do you use the Babcock test now? The Babcock test in the case of a good many farmers made a difference in his receipts of one cent per hundred pounds, sometimes more than that. After the Babcock test was put in many men only got 85 cts. where they formerly had $1.00, other men got $1.05 because they deserved it.

Now with respect to the casein test or any other improved method, ask the question "What effect will this have on the price of milk the farmer will get? Will it raise the price of milk ten cents or fifteen cents a hundred pounds?" When you get that information you can decide whether it will pay you to put it in or not. The first thing for us then is to study those things immediately, not waiting for something to convince us that such and such a thing is right or wrong, but interest yourselves and go after the improvements and find out where the faults are. It is our business to look every day in our factory

for some particular point that can be improved. I believe that every man who attends these conventions and hears these discussions and papers goes home with the determination in his mind to begin to look around. He will begin to improve long before he has to sell out. In this way every single man in the state can contribute to the improvement of cheese making. I thank you.

The President: Now, Gentlemen, our time is flying along. Unless there are some rather important questions that you would like to ask Dr. Sammis at the present time, we will proceed with the program. The next subject is the Foreign Cheese Industry of Wisconsin by Mr. Fred Marty, State Cheese Factory, Dairy and Food Inspector.

THE FOREIGN CHEESE INDUSTRY OF WISCONSIN.

FRED MARTY, MONROE, WIS.

Mr. Chairman: Ladies and Gentlemen: When Mr. Baer requested me to talk to you again on the foreign cheese industry of Wisconsin, I asked him why I should again describe that subject at this convention, but still I am here.

Another year has come and gone since we last met in Milwaukee as an organization to discuss our momentous questions, to talk over and recount the various experiences of the past season. Let us further believe that in this way and only by such intercourse can we expect to be up-to-date in our profession, for it is here that the best thoughts and ideas in this life of business are exchanged.

In looking over your program I find that our ever faithful Mr. Baer, in whose hands the responsibility and success of this association has rested, has prepared a program that is not only a credit to himself but to the whole association.

I am not going to dwell at any length on describing the foreign cheese industry of Wisconsin. The origin of the foreign cheese industry in Wisconsin dates back to the year 1846, when the Swiss colonists embarked from Switzerland to this country,

this state. The colonists first farmed a little; they raised wheat as long as the soil was ready and willing to produce it. But, for various reasons, the raising of wheat proved a failure in that section of the state, so that early in the 70's some of the farmers started to manufacture Swiss cheese on a small basis, and the cheese found a ready market. Soon a number of settlers joined, built a cheese factory, sold their milk. There in its infancy around the green hills and fertile valleys of this modern Switzerland, along the borders of Green County a new industry was brought to life. One cheese factory after another sprung up in that section of the state so it soon became the leading industry, and the year 1846 may be looked upon as the dividing line. The farmers sold their milk to individual cheese or milk dealers, which up to that year was not the practice, due largely to the fact that the farmers' resources were much lowered at that time. Then came the practice of selling their milk to the co-operative system, and today you will find that nearly all of the cheese factories in that section of the state are owned by farmers, and over 90 per cent. of the cheese factories are operated on co-operative plans or basis.

This branch of industry rapidly increased. Cheese found a ready market. Today in Green county, Lafayette, southwestern part of Dane county and the western part of Rock county the foreign cheese industry of Wisconsin flourishes, and reliable figures inform us that there are in the aforesaid counties five hundred and fifty cheese factories manufacturing annually 33,500,000 lbs. of cheese, with an annual return of $4,900,000, a wonderful growth indeed. This branch of the industry has also extended into other counties, Dodge, Fond du Lac, Winnebago, La Crosse, Trempeleau, Buffalo, Washington, Barron and other counties to a large extent manufacturing brick cheese and some Swiss cheese.

While the Swiss cheese industry in this state has made wonderful development, it has not yet reached its limit of perfection, since there are annually imported into this country hundreds of thousands of pounds of Swiss cheese commanding the highest prices. This I attribute largely to the condition of our Swiss cheese market in this state at the present time, which I look upon as the spoils of the industry. There is nothing shown in our present system that would have any influence towards the encouragement of the qualifications of for-

eign cheesemakers. This system I have termed as a "catch-as-catch-can" proposition with no good in it but a selfish greed for the almighty dollar at the expense of the industry.

Greene and its surrounding counties have become the home of the foreign cheese industry of Wisconsin. Some ten years ago an association was formed up there, now known as the Southern Wisconsin Cheesemakers & Dairymen's Association which, with its wonderful growth, has today 450 members. Let it be hoped that through the aid of the Southern Wisconsin Cheesemakers & Dairymen's Association and this association, whose purposes are to promote the dairy industry, that once more will the grade system be established in the Swiss cheese market, and our present system be banished out of existence.

I might go on and point out to you the importance of the foreign cheese industry of Wisconsin and I could furnish you still more statistics by taking the district outside of the Green county district, but time will not permit me and it is hardly necessary, when we take into consideration that only a short decade ago this industry was slumbering in infancy and today it has developed to such an importance in the state of Wisconsin as to attract the attention of the entire dairy world. I thank you.

The Chairman: Are there any questions to ask Mr. Marty? Has anybody any questions they desire to ask?

The last paper on the program this afternoon was taken up by Mr. Shilling this morning, so this completes the program for the afternoon.

Kindly remember tomorrow's session opens at 9 o'clock, instead of 10 as today. We want you all here in the morning so we can start early because this year the papers are being well discussed and will take up all of the time we have given them. We will now adjourn until 9 o'clock tomorrow morning.

THURSDAY MORNING SESSION.

Meeting called to order at 9:30 o'clock by President McCready.

The President: The first on your program this morning is Brick Cheese Making by Mr. Gottlieb Marty. Mr. Marty is instructor in foreign cheese making at the University.

BRICK CHEESE MAKING.

GOTTLIEB MARTY, Madison, Wis.

Mr. President, Ladies and Gentlemen: At the beginning of the cheese industry, about fifty or more years ago, brick cheese factories were started in Green and Dodge counties by cheesemakers who came from the state of New York, where they had already been engaged in the manufacture of soft cheese. They found the conditions good for dairying in Wisconsin and obtained good results in making cheese, considering the condition of factories and the long distance of hauling the milk in those early days.

The number of factories increased rapidly and grew to such an extent that Wisconsin today not only manufactures the most Brick cheese, but also has gained the name of supplying the best cheese that is made in the Union.

However, notwithstanding the fact that there is an enormous amount of good cheese made in Wisconsin, there is still manufactured a vast quantity of second-grade cheese caused by too much fermentation during the hot season, and by much too slow acid development during fall and winter.

In those early days of dairying, conditions such as barns and factories were in a very primitive state. The factories were, therefore, in operation usually only during the months from May until October. With the advent of the hot weather, the flies and the dry weather, the latter causing a shortage of pastures, which usually drove cows to search for weeds and leaves, occurred a great fermentation and "huffing" of the cheese, consequently causing great losses.

Later on, when factories were in operation during eight or nine months or the whole of the year, it was mainly the spring and winter cheese, often containing too much moisture, which caused the most damage to the industry. Rennet at that time being made by each operator, by dissolving the stomach of calves in whey, was responsible for a great deal of the trouble. After rennet factories were established commercial rennet was used alternately with home-made rennet by some operators, in place of all home-made rennet as in former days, but the largest per cent of makers still are using the old method of rennet manufacturing today.

Just as in the beginning of the dairy industry so in the Brick cheese district, no fat or acid tests were found for a long time, and, therefore, the maker had no means by which he could determine these two chief factors. Therefore, the manufacturing process is varied. For instance, the temperatures for setting themilk ranged from 88 to 96 degrees F.; the time from cutting to cooking 5 to 30 minutes. the cooking temperatures were from 106 to 120 and over, and the time from cutting to dipping from 40 minutes to an hour and thirty minutes. This variation in the manufacturing process is today the same as it was thirty years ago, although the fat test and the different acidity tests, as well as the use of pure culture starters were introduced some twenty years ago.

Few modern methods of manufacture have been introduced. On the contrary the annual troubles, such as too much gas in summer, and in winter time the high per cent of moisture in the cheese, still exists. The uniform product of American cheese and the increased price for the same during the past ten years often bring as high returns as any Brick cheese factory, where the milk is hauled twice a day. Why do they gain the advantage over the brick cheese factory? Simply because they use all the modern methods offered; namely, the fat test, the acid test, the starter used before setting the milk, etc. These improved methods we find in all up-to-date factories.

For the benefit of all Brick cheesemakers let me say, that it is high time that more interest be shown in adopting the more modern methods.

I feel certain that the more general introduction of the fat test, the acid test and the proper use of starters would be a great

step forward. It would do a great deal toward the manufacture of a more uniform product and this cannot help but be, not only a great help to the individual maker, but also to the dairy industry as a whole. The modern methods resulting from the introduction of these various tests, etc., have been found not only satisfactory but rest on a sound scientific basis. We, as cheese-makers, cannot get away from them. Competition is so keen that a maker cannot afford to close his eyes and refuse to see the light. We must keep abreast of the times or be crowded out. It remains with us to decide the future of this great industry of Wisconsin.

The Chairman: Are there any questions you would like to ask Mr. Marty? Anyone interested in the brick cheese industry has an opportunity now to ask questions. If there are no questions we will proceed to the next paper, Limburger Cheese Making by Mr. Jacob Andrea. I wish to say that Mr. Andrea made a proposition last night that I thought was good. He suggested that he bring one or two cheese here, even though they were Limburger, and have someone tell him what was wrong with them. We will now listen to Mr. Andrea's paper.

LIMBURGER CHEESE MAKING.

JACOB ANDREA, Monticello, Wis.

Mr. President, Ladies and Gentlemen: I do not feel called to come up before this convention and read a paper on Limburger cheese, but our secretary, Mr. Baer, thought different and he put me on the program, so I suppose I will have to make the best of it and beg you to have patience with my shortcomings.

I will now try and be brief in what I have to say. Last Spring I noticed that New York limburger cheese was quoted from 1 to 2 cents higher than Wisconsin limburger and it has been higher all summer. I asked myself, what's the reason? Is our Wisconsin limburger not as good as New York cheese? Can we not make just as good an article here, as they do in New York?

Or is our climate, the pastures, the factories and general conditions not as good as they are in the East? All these questions came to me and after consulting with some dealers in cheese, I came to the conclusion, that the climate, the pasturse, the factories and general conditions are fully as good if not superior to those in New York. Consequently, we certainly do not make the kind of article that the market demands, especially so, when there are dealers in limburger cheese who, formerly handled only Wisconsin cheese and now they will not buy a pound of it, for they say they can't sell it. Shall we therefore let the market slip from our hands, or shall we try to not only regain lost ground but beat the New York cheese?

I remember the time when you American cheese-makers were in the same rut, when your Canadian brothers made a superior quality of cheese, but things have changed now, you can not only make as good cheese as they do, but you have them beat to a frizzel. This high standard of efficiency you have obtained through the services of this association directly or indirectly.

Limburger cheese-makers, we can do the same, if we want. But how shall we do it? My answer is: By making the cheese the way the market demands. But how is it made? That is the most important question. I will say right here, that I am not here to show *you,* how it is made, but I want to *learn that from you.* I have been told by an old and reliable dealer in cheese, that limburger that scores highest at fairs and conventions is not always what the market wants. I have a sample cheese here of which I will give you a short description how I made it and after that I wish some of you dealers in limburger cheese would would come up and sample it and not hesitate to pass your opinion about it. If it is what the market wants, say so, if not, then for the sake of the cheese industry be honest and say so. I know full well, that if cheese like this was exhibited at any fair or convention, it woud not score more than 70 or 75 points. The point I wish to make is, that if fairs and conventions do not score the cheese the market demands highest, let us know about it. That is the only way we can come to the desired knowledge.

Now, I will give you a short description of how I made this cheese. It was made about the 15th of Nov. and consequently is what we call hay cheese. Milk was delivered once a day in fairly good condition and was warmed up to 92 degrees F., when

I set it with rennet extract. In the summer months I would not warm it any more than 90 degrees F. Time from setting the milk to cutting the curd was 25 min. Then I cut it crossways with a ½ inch curd knife and left it to settle until the whey covered the curd. This is done to give the curd time to get firmer so it will not break up so when worked. After that I pulled the curd over just as slow as possible and worked it that way for about 10 minutes when I turned the steam under it and cooked it to 94 degrees F. This having been done I worked it just so much longer for the curd to get firm enough, that when a small piece of it dropped about 2 feet it would not break. Immediately after this I dipped it into molds or forms and left it there for 20 minutes, when it was put down cellar on the draining table and left there to drain for 24 hours, meanwhile I turned it once. From there it was taken to the salting table and rubbed in salt three times, once a day. Then I put it in the curing cellar on shelves, where it was left to cure. While there it was rubbed every other day until it had the soft yellowish brown color, when it was packed. Now, in conclusion I wish to say a word to the Limburger cheesemakers in particular. As you know, it is not always possible to have all the cheese of a uniform size, therefore you should always pack cheese of the same size in a case and mark the number of cheese contained therein on the outside of box. That will enable the dealer to know just where to ship it.

DISCUSSION.

The Chairman: Now, as Mr. Andrea has told you, he has one or two of those Limberger cheese here. He has told you how the cheese were made and I would like to ask if there is not some Limburger cheesemaker or one of you instructors, before looking at this cheese, would like to criticise his method of making? You should be able to tell how this cheese is, from his method of making, before you look at it. I want to learn if you know as much practically as you do theoretically.

Mr. G. Marty: Do you change your method of working the curd with the different seasons? That is, do you work the curd longer in summer than in fall or spring?

Mr. Andrea: If I want to make a curdy cheese then I always dip the cheese, when I raise up a little particle of curd and drop it two feet and it does not break, then I dip it; but in summer it has to be worked longer than in the colder months.

Mr. G. Marty: What is the reason the curd has to be worked longer in summer than in spring or fall?

Mr. Andrea: I am not posted on chemistry of the milk, but the milk is not in the same condition in summer. It is thinner and the curd becomes softer, does not work so well.

Mr. G. Marty: Do you ever use the acid test?

Mr. Andrea: No I never have.

Mr. G. Marty: The composition of the milk is different in summer, the fat is higher than the casein and that is why it is necessary to work the curd longer than in the spring and fall.

Member: I suppose of course there are a good many here that have heard about Limburger cheese. I am a Limburger cheesemaker myself but I do not think everybody understands the paper. If the paper was read in German it would be easier for us to understand.

The Chairman: I would be satisfied but we could not get it in the report.

Member: There are a number here who cannot understand English very well.

The Chairman: We will allow the Limburger and Swiss men just at the present time to discuss this proposition in German if you wish, so you will better understand one another. You understand Mr. Andrea wants to show you these two cheese and you men who know about limburger, especially the dealers, he would like to have you tell him what is wrong with those cheese or what is right about them.

(The Cheese is passed through the audience for criticism.)

The Chairman: When you have a look at that cheese and while it is fresh in your minds get up and ask Mr. Andrea anything about it.

Mr. Schaller: It is not cured long enough.

Mr. Andrea: It is a November cheese and of course a young cheese, and has not had time to be sufficiently cured.

The Chairman: What objection would you have to that cheese, Mr. Schaller?

Mr. Schaller: It was not worked long enough.

The Chairman: Is that your objection, Mr. Marty, that the cheese was not worked long enough?

Mr. G. Marty: Yes, it is.

The Chairman: It is the opinion of two men that that cheese has not been worked long enough. Has anyone else that idea?

Mr. Schwingel: Do we understand what that working means? What does the word "working" mean?

Mr. Andrea: Working means from the time you cut the curd until the time you dip the curd in the moulds. The time you work the curd before cooking it and the time after cooking it.

The Chairman: My idea is that Mr. Andrea made this cheese so we might criticise it. He wants to criticise it. Now here is another one.

Mr. Andrea: I made that cheese especially soft, did not work it as long as I generally do my cheese. I have another worked in my usual manner but this cheese is made purposely soft, not worked long enough, just to find out whether that is the right kind of cheese or not. If you desire I will show you the other cheese made in my usual manner, worked a little longer.

The Chairman: Is this other cheese from the same batch of milk?

Mr. Andrea: No, but the milk was in about the same condition.

The Chairman: Of course no milk is absolutely the same as another, and in this way you would not have accurate information. The question is would that be a profitable cheese.

Mr. Schaller: I think if that cheese was cured a little longer it would be better for the market, but as it is it is too soft altogether.

The Chairman: What is your opinion of that, Mr. Rupert?

Mr. Rupert: This limburger looks more like chopped chicken, they call it cream cheese because it is white. Mr. Andrea made that cheese purposely to spoil it.

Mr. Andrea: I did not want to spoil that cheese. I stated in the paper that the market does not always demand the cheese that scores the highest at the convention, and at the same time I said that cheese like this ehibited at any convention or fair would not score more than 70 points, 70 points is about the same as nothing. I know full well that such cheese as that would

not score high but what I want to know of the dealers is whether this is the cheese the market wants or not.

Mr. Rupert: About fifteen years ago they liked that kind of cheese, but that time is passed.

Mr. Andrea: I have been told by cheese dealers who handle limburger cheese and ought to know the demands of the market, not to get the curd more than 94 and not to work it so long. It does not matter whether the cheese runs off the shelf. If it has a good firm rind that is all that is necessary. Cheese has to ripen from the outside to the inside, and they especially said those cheese that are sent to conventions and fairs and receive high scores are not the cheese they want. New York cheese I know is not made like the cheese that receives the highest score at the conventions. Why do they pay more for New York cheese? There must be something in it.

Mr. Rupert: I do not think there is any difference in the milk.

Mr. Andrea: The difference is in the making.

Mr. Rupert: Of course you show me that cheese which is a spoiled limburger. You did not have much trouble to make it that way. I tell you how you made that cheese. You put the milk in, worked it up a little, put on the steam, went out and paid no attention to it.

Mr. Chairman: Mr. Andrea admits that the cheese was not made as a good cheese, that he spoiled it. He said it would not score over 70 points. Do you think it would score 70? Now we will show you the other. An honest criticism of any cheese is what we want to get now. A man may read papers from now until doomsday and it would not make a cheese-maker out of him. We merely want you to voice your opinion on these cheese.

While this cheese is being distributed I want to announce that the election of officers will take place this afternoon, right after the address by Hon. J. Q. Emery. Our reason for this is because we believe the largest crowd of cheesemakers will be in the hall at that time, just previous to the reading of the scores, and the reason we want the largest crowd is because this is your convention, it is up to you to elect whom you desire for your officers.

This other cheese, as Mr. Andrea tells us, was made about

the same time as the one you have just looked at, but made a little differently. How was it made differently, Mr. Schaller?

Mr. Schaller: He worked it longer.

The Chairman: Do you think it a better cheese than the other?

Mr. Schaller: It is a better cheese than the other.

The Chairman: What is your opinion of it, Mr. Marty?

Mr. Marty: That cheese is more worked than the other and therefore is a better cheese. I would like to ask Mr. Andrea if he used commercial rennet, or did he make the rennet?

Mr. Andrea: I use commercial rennet extract.

The Chairman: Does anyone else want to express an opinion on that cheese?

Mr. Rupert: There is not much difference between them, a little difference, but I do not think it is the right kind of cheese. This cheese is not worked right. Don't you think that, Mr. Andrea?

Mr. Andrea: I do not want to say either way. That is what I want to find out from you, and from the men who deal in cheese and know exactly what the market demands. We Limburger cheesemakers know this cheese is not worked right for the scoring exhibitions but is it the right cheese for the market I am told by one of the biggest cheese dealers in Brown county that that is the kind we want.

The Chairman: Is there a man in the audience who deals in limburger cheese, buys and sells it? Very frequently the makers have their own opinions while the dealers have contrary ideas as to what would suit their trade.

Mr. Rupert: I do not think that cheese was made right.

Mr. Schaller: According to my opinion, if that cheese gets a little older, in two or three weeks it will be just what the trade wants.

The Chairman: Mr. Schaller's opinion (and I know Mr. Schaller is an old cheesemaker) is that if that cheese were cured at the right temperature and kept until a little later it would be what the market demands.

Mr. Marty: The second cheese is the kind that is found in every factory. I noticed at the last convention or two, the limburger cheese that took the first prize was made by a Swiss cheesemaker, which shows that Mr. Andrea's opinion is correct

that a cheese that takes first prize at a convention we hardly find in the market. No matter what kind of a cheese the Swiss cheesemaker makes he cooks his curd more than the man who only makes limburger cheese. He does this from force of habit.

Member: I believe that cheese should have been worked a little more. I fully agree with Mr. Schaller that when it is a little older it will cure up to meet the demands of the market, but it would be a market that demands a strong flavored limburger cheese. My trade desires a milder limburger. I believe a little more drying would do away somewhat with the strong odor.

The Chairman: Your idea is that we should have an odorless limburger?

Member: Not odorless but not quite so strong.

Mr. Andrea: That odor is the very essence of the limburger. Characteristic of limburger cheese, but if limburger is worked and cooked more it will not have so strong an odor. Is that right?

Member: Yes, that is true.

The Chairman: Apparently you Brick, Swiss and Limburger men have the same things to contend with as we do in the American cheese business, sacrifice quality for quantity and it seems to be the idea to see how much they can make. I think the most important thing is the quality. It does not matter if you have 200 lbs. or 190 lbs. to sell, the man that has a good cheese will get the price for it. There are always people willing to pay a little more for stuff that suits them.

Mr. Schaller: Mr. Rupert said the limburger cheese was not worked right. I would like to ask him how he worked it? I believe both men are right.

Mr. Parkin, Minnesota: The speaker said that the cheese that scored the highest at the last two conventions was not the cheese the market demanded. I do not understand that, I suppose the judges catered to the market.

Mr. Andrea: This is what I said in my paper: "It is not always the cheese that scores highest at the conventions that is best for the market."

Mr. G. Marty: Two years ago in Milwaukee we had at our exhibit some brick, limburger, and Swiss cheese. There were

those two kinds that we have been discussing here. There was one cured clear through, the other like the one that has been passed around here for our inspection. The cheese that got the highest prize was the one that was cured clear through.

The Chairman: If there is nothing further I have a letter to read to the cheesemakers present addressed to me from Hon. John Luchsinger of Monroe, Wis. I thought it best to take this up now because I think there are more interested people here than we have had at any other convention.

Monroe, Wis., Dec. 29, 1911.

FRIEND J. B. MCCREADY:

The dealers and makers of whey butter are having lots of trouble here. A number of shipments have been seized in Chicago and made to pay a tax of ten cents a pound as adulterated butter on the ground of containing more than 16 per cent of moisture. Also claim for $600 license fee is made on each for manufacturers' license.

I wonder if any of your people have had similar trouble? The Revenue Service acts on a rule made by the Commissioner of Agriculture, that says "Whey butter containing 16 per cent or more of moisture shall be deemed adulterated butter and shall pay a tax of 10 cents a pound, etc." I am informed by our people that with existing conditions in cheese factories it is impossible in the warm months to extract the moisture so as not to be liable to tax and penalty. Especially is this the case where no salt is used, which is the case in most factories, the trade wishing it that way. I think it would be a most interesting and important matter to bring before the convention, and get an expression on. I will hardly be there but there are others. I see the matter of foreign cheese is coming up. I made a talk on that subject in 1907. You will see it in the report. Best wishes for a happy New Year.

JOHN LUCHSINGER.

DISCUSSION.

The Chairman: Condensed, the one fact is this, apparently you are making butter that contains more moisture than the law allows. I would like to have this matter discussed because it is of much importance to you, and perhaps some of the American cheesemakers who are making whey butter could tell us whether they are having any trouble with it or not. I have never heard our makers say they have any trouble with too much moisture. If there is anyone can say anything on this subject he will now have an opportunity.

Prof. Lee. A short time ago I saw a piece of butter made from whey fat. That pound of butter was as good in flavor, if not better, than the average grade of butter I have a chance to see now-a-days. The makeup of that product I considered perfect. The stuff was made by a man who was selling it in Milwaukee. The water content of that pound of butter was below the average water content of creamery butter. I am of the opin ion, and Mr. Marty will bear me out, the reason we are having trouble with the high water content in whey butter is that the men who are making it do not make it right. We have no right at all to listen to an argument that we shall pass whey butter through with a higher water content than has our creamery butter. Only yesterday I was trying to see what I could do for a man who had trouble as this man does with the revenue department. The butter was sent to me and I found water content in the neighborhood of 24% of water. I had 213 lbs. of butter whey today and when I got through with that same butter, when I took it out of the churn, I had 272 lbs. I had 213 lbs. of that butter and you cannot tell the difference in looking at the butter as compared with the 277 lbs. You can make your whey butter and give it a low water content if you handle it at a low even temperature. I believe the trouble is the men handle the stuff too soft, especially is that true when handling the unsalted product. You skim the fat off and try to handle it at high temperature and do *not get rid* of the water. Mr. Marty has been doing some work along this line and he finds too, if water is at right temperature and the butter is not too slushy and granules not too large, there will be no trouble in getting whey butter with less than 16% water.

The Chairman: Mr. Baer wants to make one or two announcements at this time.

Secretary Baer: Gentlemen of the Association, there are more cheesemakers in the hotel corridors of the three or four different hotels this morning than there are in this hall. They have been coming in fast for the last few minutes and I promise you this afternoon we shall have to have more chairs and seats to take care of the people.

The score of the cheese exhibits is complete, the averages have been made and the records are ready to report this afternoon. The silver cups have been engraved, the diplomas have been made out and signed by the officers of the association and will be ready for distribution after the scores are read. The pro rata premium fund has been figured and Mr. Wallace, the treasurer, will pay it out at the close of the afternoon session at the office in the rear of this hall.

The Chairman: We have had a very interesting discussion. Professor Lee has said that low temperatures would aid you greatly in getting rid of some of the excess moisture in your whey butter. I believe the Swiss factories are hardly situated right for the proper handling of it. I do not believe many Swiss factories use a starter as yet, use the gravity system of skimming and churn at rather high temperature. Is there anyone else who desires to say something on this subject? that is whey butter? If there is nothing further on this, we will proceed with the next paper "The Relation of the Wisconsin Scoring Exhibitions to the Cheese Interests of the State" by Professor Carl E. Lee, in charge of the Wisconsin monthly scoring exhibitions.

THE RELATION OF THE WISCONSIN SCORING EXHIBITIONS TO THE CHEESE INDUSTRY OF THE STATE.

PROFESSOR CARL E. LEE, Madison, Wis.

The aim of the Scoring Exhibitions conducted by the Department of Dairy Husbandry, College of Agriculture, University of Wisconsin, is familiar to a large number of the members of the Cheesemakers' Association.

It is one of the active agencies for the advancement of the quality of Wisconsin cheese and the improvement in the cheese industry as a whole. The main object is to help those who do not make the best grade of cheese.

The output of a large number of cheese factories in Wisconsin could be greatly improved at little expense to both the factory and maker if the operators would become members of the Scoring Exhibitions.

That there is a need of this educational work can best be illustrated by two factories located in the same territory, the cheese from one has the reputation for quality and is always in demand, while the other one cannot turn out a good marketable product.

WHO SHOULD BE MEMBERS OF THE EXHIBITIONS.

Primarily the men, who are making cheese that lacks quality, perfect body or texture or is in any way defective, can be greatly benefited by the scope of the Scoring Exhibition work. When any of these defects occur in the cheese, there is a direct cause for it somewhere. The man at his every day work may not locate the cause as readily as can the persons, who have an opportunity to see a large number of cheese, having the same general defect. The men who always make cheese of good quality may not directly need the assistance of the Scoring Exhibitions, but indirectly they should exhibit in order that their cheese may be used as an illustration.

During the past year requests have been received from cheesemakers, who desired to learn, asking that from time to time reports showing methods used in making high scoring cheese be

published. This no doubt would be beneficial to the cheese making industry.

There is a large class of cheesemakers in Wisconsin who make cheese that is barely passable, as a representative of average quality. By all means they should take part in the Scoring Exhibitions, it would assist them in their factory operation. The score, which is placed upon an exhibitor's cheese, is never made public unless it is so requested, consequently the fear of a low score should never be an obstacle to anyone.

CHEESEMAKERS SHOULD ADVANCE.

Unless a cheesemaker can see that he is working with improved facilities or under better conditions and making cheese of higher quality each year, it is time to consider wherein lies the cause. No up-to-date cheesemaker can afford to remain under identical or poorer conditions from year to year. The greatest good in this kind of work can best be accomplished when a sufficiently large number take part to make results comparable.

The Cheddar cheese are handled as a class and during the past season, Mr. Bruhn, who has acted as one of the judges, has brought out some very valuable suggestions. Mr. G. Marty has handled the Foreign cheese articles, but he has been handicapped on account of the small number of cheeses for certain months. During the past year as large a number of cheeses have not been received as should be expected in order to make the work profitable.

In cheesemaking history repeats itself, it is therefore, natural to expect that the defects generally found in cheese made in early spring will occur year after year unless the cause is guarded against. It has, therefore, been the plan to point out in these articles, the direct cause in order that in another year these defects will not be so prominent. The result of this work has been very strongly brought about in the general workmanship of Wisconsin butter and will be equally true in cheese. Workmanship is a great factor in buttermaking and without a doubt is equally valuable in cheesemaking. Is there any reason why there should be any cheese made in Wisconsin with defective make-up or general appearance?

METHOD BLANK SHOULD BE PROPERLY FILLED OUT.

Whenever a cheese is sent to the Scoring Exhibitions at Madison, it is very essential that the Method Blank be properly filled out. This will enable the person to criticise the cheese better and offer suggestions. There are certain defects in cheese that are produced by several causes and in such cases, an intelligent letter can be dictated only when the general method of making is known.

THE FOREIGN CHEESE INDUSTRY.

It is desired that a larger number of the factories making Swiss, Limburger and Brick cheese avail themselves of this work. No doubt those, who have taken part during the past season, have aimed to follow the suggestions offered by Mr. Marty in his letter to the exhibitors. It is just as essential in the making of these cheeses that the Method Blank is completely filled out. It seems as though the makers of the Foreign cheese do not lay the stress upon certain fundamental principles that the makers of Cheddar cheese consider very important. The greatest improvement in the quality of Cheddar cheese has been brought about since the introduction of the Babcock and Acidit Tests. Since the questions as to whether the per cent of fat or acidity of milk when set, are always unanswered, it is taken for granted that neither tests are used. Not long ago nearly all exhibits of a certain variety of cheese had defective body and an excessive amount of moisture for the good of the quality. The direct cause for this was pointed out by G. Marty to be due to the relation existing between method of making and per cent of fat in the milk.

With twice as many cheese factories as creameries in Wisconsin, it does not seem right that more than twice as many exhibits of butter are received during the year. With the new curing-rooms and better facilities for handling the cheese during the coming year, can we not have a larger representation of the Wisconsin cheese industry?

DISCUSSION.

The Chairman: Are there any questions you would like to ask Professor Lee in regard to the scoring exhibitions? I merely wish to say here that what he said in regard to the small details count for a good deal, such as filling out your blanks showing in what manner or by what method your cheese and butter were made. He said a great many were not made out simply because they did not know. I say it is because of carelessness. It is important that the blanks will be filled out right. Are there any questions you would like to ask Professor Lee? We have a little time yet.

Mr. Parkin, Minn.: I would like to ask Prof. Lee if it is not a fact that the makers participating in those contests are the most up-to-date makers? How are we going to reach those men that are in need of the benefits to be derived from those contests?

Prof. Lee: I do not know that I can answer that question, unless it be this, that I believe there are several makers in Wisconsin that know they are not making good cheese as they should, but they know if they send cheese to Madison to be scored the score will be low and they do not want people to see that score. The system we are working under is that no score will be published unless so requested by the cheese maker. The idea of being afraid I know has barred a good many young men from taking advantage of this educational work.

Mr. Andrew: I would like to ask Mr. Lee a question in regard to the scoring contest. My opinion about it is that those contests are for the purpose of showing the cheese makers how to improve their product. Is that not so?

Prof. Lee: Yes sir, that is the main purpose and the only purpose of the exhibitions, to help the cheesemakers make a better cheese. There is nothing in it for us. I know it has taken away from me a number of hours when I ought to be in bed.

Mr. Andrea: That then in my opinion is abused, because the cheesemakers try to send their best cheese so as to get the highest score. Of course it is natural to take pride in a high score but that is not the object of the scoring contest, as I look at it. The object to be sued the poorest quality of cheese and have the judges say what is wrong with it.

Prof. Lee: The object is to send the cheese of your every day make or a cheese similar to the cheese you are making from certain lots of milk which you are not able to handle properly, and I believe if that kind of cheese is sent to Madison you will receive benefit from the contest. If it is an American cheese Mr. Bruhn at the present time is able in most cases to tell that that cheese was in such and such a condition; Mr. Marty for the limburger, brick and Swiss can do likewise. Whereas, if a man goes to work and makes a special cheese, as I know a great many creameries have made special lots of butter, it will not benefit him. It is a detriment to the scoring exhibition for a man to send us a high grade of goods to the scoring exhibitions. He simply says we do not score the butter right. I have tried to discourage the idea of sending a special make of any product.

The Chairman: Are there any further questions?

Prof. Lee: I could cite you instances where men have started out with the reason making cheese with certain defects, and looking over our file of letters we can find where a man sent a certain cheese the beginning of the season; the judges wrote on the score card pointing out the trouble, and the man who received those cards and letters afterward tried to overcome his defects. We can also show there has been a slight improvement. For instance, we had one case where a man made a poor cheese and then, by following out certain suggestions, he produced a cheese that was perfect in workmanship; a letter calling his attention to what was wrong and the first thing we knew that man sent several cheese that have been very high scoring.

The Chairman: Are there any other questions? If not we will stand adjourned until 2 o'clock this afternoon.

THURSDAY AFTERNOON SESSION.

Meeting called to order at 2 o'clock by President J. B. McCready.

The Chairman: I want you to come as well forward as you possibly can because there will be a large number of people here this afternoon. The awarding of prizes and reading of scores will bring every member here.

The first on the program is an address by Dr. M. P. Ravenel, of Madison, Wis.

SOME REASONS FOR FIGHTING BOVINE TUBERCULOSIS.

DR. M. P. RAVENEL, MADISON, WIS.

Bacteriologist Wisconsin Live Stock Sanitary Board.

Mr. President, Ladies and Gentlemen: It gives me a great deal of pleasure, to accept the invitation of your secretary to give you a short talk this afternoon on Some Reasons for Fighting Bovine Tuberculosis. This is a subject in which I have been interested for more than fifteen years. I was born on a plantation, the son of a farmer, and all my people since away back, in this country, have been farmers. I make this statement because I have been accused repeatedly of being a man working only on the outside and not knowing of the farms, not knowing conditions, and only within the last week I had the pleasure of hearing that certain farmers considered me a grafter because I believed in eradicating tuberculosis from the herds of our state.

I could talk to you a great deal longer than I want to keep you, in discussing tuberculosis from the cattle standpoint, but I will dismiss that with a few words. Those few words, however, it seems to me ought to be enough to carry home the truth to every man and woman in this audience that Bovine Tuberculosis is the scourge of cattle, is a scourge which costs

millions and millions of dollars to the farmers of this cuntry, and from that standpoint alone it should be wiped out.

Now we talk a great deal about the high cost of living. I can give you some figures which certainly tend to make the cost of living high. Tuberculosis is estimated as being the cause of two-thirds of the contamination of cattle and hogs which are sent to all the slaughter houses in our country. Chicago, Omaha, Kansas City, Cedar Rapids, New York, Philadelphia, all the great slaughter houses of our country; two-thirds of the total loss on cattle and hogs shipped to those points is due to this single disease. Let's take some figures for last year. I will tell you first what the loss is estimated at. The loss on cows, when the whole thing is condemned, when they kill a critter, that is an animal that can be sold for beef, is $45 for each animal; for a canner $18, for each animal condemned. The loss when the cow is condemned for food but can be rendered into tallow, hide and hoofs saved, is $20 per head; the loss on calves when condemned is $7 per head, that is veal calves; the loss on hogs $8.50 when an animal is condemned, and $5.75 when part of the animal is put in the rendering tanks and its fat used.

In 1908 we had in cattle killed under government inspection (these are the only figures we have which we can depend on, many of the smaller slaughter houses are not inspecting at all) we had 7,116,275 animals slaughtered, that is cows and steers, and of that number 68,395 were condemned, Think of that, 68,000 cattle condemned on account of tuberculosis. Of calves, in all 1,995,481 slaughtered with only 524 condemned. The hogs slaughtered in 1908 numbered 35,113,077 and of that number 719,309 hogs were condemned. The figures are perfectly appalling. Think of 700,000 hogs being condemned on account of tuberculosis. What does the money loss mean? In 1908 $710,607 on cattle, $1,401,723 on hogs and cattle went into the slaughter houses under the government inspection, and this is more or less of an estimated loss, the loss was $1,702,000, making a loss to the farmers of the country, of $3,832,436. Losses from this one disease. Is it not perfect appalling? The loss from depreciation on the farm from not giving milk from loss of selling value, etc., is estimated and this of course is largely guess) as $8,048,000, and that is not the whole loss.

According to the laws of the government, if they decide on condemning an animal owing to the existence of the disease, and if only one group of organs are tubercular they cut those out and use the rest of the carcass for food. In 1907, 364,559 parts were condemned and those were estimated at in cattle 50 cts. and in hogs 25 cts., and that adds $20,000 to the total loss. In 1906 there were only 113,491 parts of hogs condemned and in 1907, 364,559 parts condemned.

Now we talk about our cost of high living and I expect some people, probably not an intelligent audience like this, but lots of people generally believe that that loss is borne by the packers. Anybody that thinks the packers bear that loss is simple. The packers are not in business for their health and the loss falls ultimately on the consumer and partly on the farmer, because a man who is going to buy cattle and knows some of them are going bad on him is not going to give the price to the farmer which he would give, if he were certain those cattle were good stuff, so the farmer bears the loss and if I should say not another word, it seems to me it is as clear as the fact that two and two are four that tuberculosis is a disease the farmer should fight because it is affecting his welfare, his pocketbook. I do not see how anybody can gainsay that proposition. I do not see any argument against that, but if anybody has an argument against it I will be glad to answer it before I finish.

As I said, I might stop right there but we can talk that sort of talk until we get blue in the face and with a great many people it will do no good at all. We have to show one other thing before we can get good laws passed, we have to show that poeple are dying of tuberculosis, that bovine tuberculosis is a menace to the public health. I have to go back in history a little to bring this clearly before you and I lay particular stress on this, because, here is the Milwaukee Board of Health passing a law by which no farmer is allowed to sell milk in the city unless his cows are tested with tuberculin. The farmers of Waukesha county got out an injunction to prevent the city from enforcing that ordinance. The case was decided in favor of the city, was appealed and decided in favor of the city again, then it was appealed to the Supreme court of the state and that body still has it under advisement.

The farmers of Waukesha county attacked that ordinance on two grounds, first that bovine tuberculosis was not dangerous to human health and consequently the Board of Health of Milwaukee had no right to say they should not sell milk containnig bovine tuberculosis bacteria, and the other argument was the one of the unreliability of the test by tuberculin.

Now this whole proposition dates back to 1901, most of the turmoil we have at the present time dates back to 1901. In 1882 the great German Bacteriologist Koch, who has lately died, discovered the germ of tuberculosis. He gave that germ all sorts of scientific study and he said over and over again, as plainly as one could say it, that wherever he got this germ, whether from the lungs of a man or from the intestinal organs of a man, of from the lungs of a cow or from the organs of the cow, they were one and the same thing. He went further than that, he said, "It seems to me there might be some difference in these germs from different sources but, although I examined theme carefully, I could not detect any differenc." That is from his original writings. I can show these statements to you from his original writings. That went from 1882 to 1896 when Dr. Theobould Smith, from Harvard, showed that the germ from cattle was thirty times as disease producing as was the human germ and showed it was pretty hard to have a cow get tuberculosis from a human being.

At the great London congress on tuberculosis, in 1901, Koch had been repeating some of Dr. Smith's work and had announced in almost these words, "I find the two diseases are different and cattle cannot be infected from mankind. You cannot produce tuberculosis in a cow by the disease from mankind and if the opposite statement is true, that is that man can be infected by the tuberculosis of the cattle, it is not more common than is hereditary tuberculosis which now is very rare indeed, and therefore I think there is no use in taking any steps against bovine tuberculosis." That was in 1901. Almost immediately the German government appointed an imperial Commission and on that commission were some leading professors of the German empire, including Dr. Koch. The English government appointed a royal commission, composed of five of the best men in England, and since that time both commissions have reported. The German government in the first report

moved heaven and earth to sustain Koch, but in their last report said flat footed they had examined eighty-four children who died of tuberculosis and one-quarter of them were dead from cattle tuberculosis. That is right from Koch's own commission, the Imperial commission, which was certainly appointed to sustain him, yet that commission said that one-fourth of the children died from the bovine germ. The English commission, which never did believe in what Koch said, reported on sixty-four cases, and of these sixty-four cases they found 23.8 per cent., a little lower than the German commission, also died of bovine tuberculosis.

In our country what have we done? Many of us who have worked at this subject in our own country have not had money enough to go to a hospital and take every case that died and examine a great many of them. That is the only way to get at a fair inspection. We have had to take selected cases and in that way our percentages have run away up. What we have been able to do, with the exception of one case, is to prove that a large number of children die of bovine tuberculosis but we cannot give exact percentages. However, in the great city of New York, and this is particularly interesting because the leading man in New York in the cases of diseases of children is Dr. Holt. Holt has always said there is no danger from milk, we need not worry about getting tubercular milk and giving it to children. Northrope said the same thing, and most of the medical profession in New York held that there was no danger from milk. Dr. Park, director of the laboratories of the Board of Health there, had that opinion himself to a certain extent. However, he started to work on the subject and what did he find? He found in children under five years of age that 26 per cent. of the children who die from consumption die from the cattle disease. He estimates that means, to New York children alone, over 300 children die from cattle tuberculosis every single year in that one city. That is right under the noses of the men who said there was no danger. That comes from a man who also did not believe in it, just like the German commission reported. They did not believe in it very much but were forced to believe in it. Dr. Park found that; he found that in children under five years of age, 84 of whom had died of tuberculosis there were 62 died of the human germ and 22

from the bovine germ. He examined 54 cases of children from five to sixteen years of age and found forty-five died from the human germ, only nine from the bovine germ; and when you get to grown people we find 296 cases out of 297 died from the human germ, only one from the bovine germ. Taking his figures with those of the German commission and the English commission and the number of workers in the different parts of the world, here is getting to be quite a mass of figures which I will not read to you. In adults 677 people died of the human disease and nine from the bovine disease. In adults there is not much danger from bovine tuberculosis; in children from five to sixteen years of age 99 died from human and 33 from bovine tuberculosis, but it is worse when we get to younger children, 161 died from human and 69 died of the bovine disease. Now the value of many of those figures is that they come from people that did not believe in it until they looked into it.

There is one point I wish to explain to you. Koch never said at the beginning that these germs were entirely different. He said, "They are different relations, different types." He never said they were different germs. No one who knew anything would mistake a Holstein for a Jersey cow and yet nobody would doubt that they were both cows. They are different relations or types of the same specie. The same is true of corn and wheat, you have varieties of oats, varieties of corn, varieties of wheat; nobody doubts they are one and the same plant but they are different, they have taken on certain differences, they are a little different.

Now an objection which is raised to these views is how do the children get this bacteria into their system. Well that is a good point. It has been shown, and nobody questions this, Koch himself never did question that, if you milk a cow which has generalized tuberculosis, a large percentage of your samples of that milk will contain tubercular germ. Take market milk, one of the men in the Rockefeller institutute found it in 70 out of 100 samples he examined. Wherever it has been examined, it has been found, in Germany, in England and in this country, that when a cow suffers from the generalized disease you will get a large proportion of samples of milk from that cow which shows that germ. Just how it gets into the milk we need not discuss here. In one series of cows which I myself examined,

with a doctor from Pennsylvania, we found it in 16 per cent. of the samples, milk drawn with every precaution, the udder washed and the milk drawn in sterile receptacles of the veterinary department of the University of Pennsylvania. In that case I cannot but believe that the germ came from the udder of the cow. It has been shown by a number of other workers that it comes from stable dirt. A cow does not spit in the same way as a man does, the majority of the stuff the cow throws up is slime and passes through the bowels into manure, and in the dirty stable the dust and dirt of the stable and of the cow herself gets into the milk; but it makes no difference to us how it gets there, we find it in the milk. How does the baby get it? You may well say that a man who is attending cows all the time may breath it in, but a baby under five years is not around the stables, and generally speaking you will not get children under sixteen years of age in the city of New York exposed to cows. There are no cows in the city. How do they get that germ into their systems? They get it through the milk, and there is no other way for them to get it. They have to get it through the milk, absolutely they get it from milk or meat because we find in those cases almost always the intestinal glands are involved first and the lungs afterwards. But that is not here or there for the purpose of our argument, but children get the disease from cattle through the food products of those cattle, and the principle food product the baby uses from the cow is milk. We all know that ever if we are bachelors. The cow is the most useful animal in the world, it is the greatest food producer. Milk and milk products are a universal food, the most valuable single food we have in the world, therefore it is our duty to protect our milk supply from this dreadful disease.

When you have foot and mouth disease, which has not touched the cattle of this country, or you have glanders in your herds, when you have any one of those contagious diseases, is there a farmer from one end of the country to another who does not write to Washington or to his state veterinary and ask for help? When you have hog cholera do you object to a man coming to help you clean out that disease? I never head of an objection, but when we talk about tuberculosis there is an objection.

The average life of cattle is short. We milk them for a while and then reward their fidelity by putting them on the block and

selling them for beef and bologna sausage, so the average life of an animal is short and it may be said that not many animals die of consumption because they are not allowed to live long enough to die, they are killed, but I will tell you a story which I found on my observations. When I was working in Pennsylvania, in West Chester county one of the richest and most beautiful counties in the United States where there are the most magnificent herds, there was one herd so badly diseased that it was a menace to the whole community, but we did not have compulsory testing. If a farmer asked for a test he got it, but when he objected it was not forced on him. That man would not test until in one season he lost three or four cows, then he had them examined and found that every animal at his place was badly diseased with tuberculosis, and he did not get one cent of salvage from any of them because the thing had gone so far there was no chance to make salvage out of the matter, and that will be the experience of any man who keeps his cows long enough as the disease is a progressive one.

Here comes the salvage part of it. We must believe in this because we protect ourselves from our neighbor. I can give you figures to show that a healthy herd pays better than a sick herd. I have no doubt lots of men in this audience know that without any figures to prove it. How is the disease spread? There are two ways. It is spread through the creamery. You know the general practice of carrying milk to a creamery is that the farmer gets back his skim milk, or he will get some by-product from the milk, but he does not get the same milk he brought to the creamery, he gets a mixture of his own milk and some from his neighbor's from vats which are common to a whole lot of patrons of that creamery. That farmer may take good care of his milk and his neighbor may not take good care of his milk, and the first thing the farmer knows his calves and hogs are suffering from tuberculosis.

I was in Chicago the other day and was told by a veterinarian at quite a big packing house there that Wisconsin sends more tubercular hogs in percentage than any other state sending hogs to Chicago. Why is it? Hogs practically contract tuberculosis in two ways. Tuberculosis is not a disease of hogs primarily. It is not a disease that spreads from one to the other. They get tuberculosis in two ways; from feeding, and from the drop-

pings from tubercular cattle, and drinking the milk from tubecular cattle, largely from creameries. Ask Mr. Jones, who makes that delicious country sausage at Fort Atkinson, he will give you figures showing how tuberculosis in hogs is increasing every year he has been in business. In 1906 there were thirteen thousand hogs condemned, in 1907 there were 364,000 condemned, a constant decrease. Doesn't that affect the farmer, even without the figures I have given you from Dr. Park?

There is one other great way by which tuberculosis is spread and that is by sale. Two years ago out of 363 herds which were examined in this state and found to be infected with tuberculosis, 263 had been infected by bringing in new animals. In the state of Pennsylvania there are whole herds that never had a case of tuberculosis in them because they did not bring in new cattle. Tuberculosis has been introduced in this country by bringing in high grade cattle.

Now one other point I wish to make and then I will close. Regarding the eradication of tuberculosis, it seems to me I have given you reasons for it on the human side, because it is a disease spreading to human beings, and on the economic side, because it is a bad scourge against the farmers from the length and breadth of this land. The eradication of it depends on one thing, that is the tuberculin test, because cattle are like men. All of you know men who have had tuberculosis for thirty or forty years and did not die of it. In the same way you get some cattle. I can show you pedigrees of a prize cow from Minneapolis and she showed tuberculosis from one end to the other. I can show you pedigrees of other cattle kept under good conditions which did not succumb to the disease, but remember such a cow is dangerous to the other cows with which she is associated. So that while it is not very evident, it is an insidious disease and does its work just as well as those diseases which do things in a hurry.

The secret of the eradication of tuberculosis is to detect it early, find out the first stages of the disease and get rid of your diseased animals, and the only way to do that is by the tuberculin test. It is a very funny thing that the men who condemn the tuberculin test and say it is unreliable and does not show tuberculosis, are the ones who turn around and quote Dr. Koch as saying there is no danger from tuberculosis. When they want

to believe what Koch says they believe it. Tuberculin was invented by Dr. Koch and I have heard him speak of it in the highest terms possible and up to the day of his death he believed it was a great agent. The belief in tuberculin does not depend on what I believe, or what you believe here in Wisconsin. Tuberculin has been tried in every country in the civilized world. The best veterinarians and the best doctors in practically every nation in the world have tried this thing out, as have many of the best farmers, and the opinion all over the world is that tuberculin is a safe diagnostic agent. I have some figures here. In the state of California they tested 9,618 cattle, 817 reacted and 817 showed tuberculosis, that is 100 per cent.; in Massachusetts they tested 86,223 cattle, they called out of this number 10,760, and of this 99.34 per cent. reacted 99.34 per cent; in Rhode Island they tested 653 and killed 104, 100 per cent. In Wisconsin we have, from the last figures available, 32,297,915 tested, only 87 per cent. correct, but taking all the figures together, a total of 408,000 cattle tested, 24,784 killed, showed 98.39 per cent. correct. If we leave out one state where we know the testing was badly done, there comes up to 98.8 per cent. correct. Is there any human procedure more correct than that if some of you want to say, bad testing has been done I agree with you; if some of you say, there are rascally veterinarians I will agree with you there; if some of you say, there are doctors that are not honest I am willing to admit it, but I mean to say, of all human agents and all human procedures there are very few more absolutely correct, than the tuberculin test has proven itself to be all over the world. Now and then, we are going to have some mistakes. For instance, a man tests an excited cow, or a cow just before freshening, or does not take proper temperatures he will have some errors but so it is in every human procedure, and I do not know of any human procedure which is more correct than the tuberculin test.

I have kept you longer than I had intended. It is a subject on which I have spent fifteen years of the best part of my life, a subject which I went to Europe studying for six months in company with Dr. Leonard Pearson, of Pennsylvania, a subject on which I have thought very deeply. I have it at heart on account of the cattle industry because, as I said before, it is a

scourge, it is a curse, and it is getting worse and in the old states where they have taken care of it, it is such an enormous problem that everybody stands aghast at it. It is like trying to dam Niagara Falls it is too big a problem to tackle. Up here in Wisconsin we have probably 5 per cent. of the cattle infected at the present time. Let's take hold of it while the state is young, while we have plenty of healthy cattle, and take hold of this law prohibiting cattle being brought into the state for dairy and breeding purposes. If you have a herd which is not quite healthy get rid of your diseased animals and keep the rest pure. Take the problem because it is one that affects us so vitally from an economical standpoint and also because it is a disease which is dangerous to human life.

Thank you very much for you attention.

DISCUSSION.

The Chairman: I think this address of the doctor's has been a very interesting one and also a very important one. I feel sure we can get more information by asking a few questions. Would anyone like to ask the doctor any questions on this subject?

Member: I would like to ask the doctor if there is any such thing as tubercular germs in the cheese that might be transmitted to a human being?

Dr. Ravenel: All of these subjects, the passage of bacteria germs into the cream, butter and cheese, have been studied and brought out from time to time. I have never been able to find out a single case of infection from cheese or from butter. I think from the theoretical standpoint we must admit there is a slight danger, but I have never heard of any infection and it must be a very light chance. In butter there is more danger than in cheese, because that is a fresh preparation, but in cheese I should be inclined to disregard the danger.

Member: If there is any danger in butter why does not the state of Wisconsin make it compulsory to test every cow? As the law reads today I have to have my cows tested or not sell the milk.

Dr. Ravenel: The general trend of legislation is to do it lit-

tle by little. At the last legislature a law was passed requiring the testing of cattle brought into the state for dairy and breeding purposes. In the state of Massachusetts, where they first started tuberculin testing they made it compulsory and that caused so much opposition to it that the law fell through. In Pennsylvania, where these things are done more successfully, under the very successful guidance of Dr. Leonard Pearson, this thing was made voluntary and the farmers have adopted it, as in Wisconsin, without it being compulsory. More and more are adopting the test for their own interest and protection. I cannot tell you what was back in the minds of the lawmakers of Wisconsin, but I think it is because they are little by little trying to clean it out without making it a hardship for the farmer, and little by little making the laws more strict, and I know at the last legislature there was a law introduced compelling the tuberculin test. A number of us opposed such a law as we believed it would excite a good deal of opposition.

Member: Don't you think that the quicker we put a law on the statute books to compel every man to do this and save our people from dying, the better off we will be?

Dr. Ravenel: Theoretically I think you are entirely correct. I would believe in that but, as I said, there are lots of things that must be taken into consideration. For instance, small pox; if you make too strict laws the people are against you and no law is worth a cent that is not backed up by the community, and you cannot go into a procedure of this sort against the will of the people, it has to be done gradually. Try to get the people to believe in it. From the theoretical standpoint, I believe the law should be compelling. There is a division of opinion among men as to just how fast to proceed. In a great many places where they have tried to go too fast there is much opposition and less accomplished than where it is gone at more slowly. You must never go faster than public sentiment will go with you.

Member: I think the way it is now it is only a veterinary game. There are a good many veterinarians going around the country and making a living off this testing.

The Chairman: Are there any other questions? I am sure you will be disappointed to know that the Hon. J. Q. Emery cannot address you this afternoon. Secy. Baer will explain the reasons and make Commissioner Emery's excuses.

Secy. Baer: Yesterday afternoon I received a telegram from Commissioner Emery telling me it would be impossible, owing to ill health, for him to arrive in the city yesterday but he anticipated coming with Mr. Larson, assistant commissioner, to the city today. Early this morning I received a telephone message over the long distance, and I could readily understand from the tone of his voice through the instrument that it was entirely impossible for him to come here and attempt to address you. Later in the day I received this telegram which I will read to you:

Madison, Wis., Jan. 12, 1911.

U. S. Baer, Sec'y.
Wisconsin Cheese Makers' Ass'n,
Milwaukee.

I greatly regret that because of severe attack of grippe I cannot go to Milwaukee. Please convey my cordial greetings to the association and congratulations on successful meeting.

(Signed) J. Q. Emery.

I will state to this convention that Hon. J. Q. Emery has been an extremely busy man, as he always has been for that matter, but especially so during the last few months and has been suffering with this attack of grippe for some time. In addition to that for the last year Mrs. Emery has been an inmate of a hospital, through a very serious railroad accident that occurred in Missouri over a year ago, and Commissioner Emery has been with her outside of office hours night and day, every day in the year, and it is through all of these things, especially this severe attack of grippe that he is unable to be with you this afternoon. He had planned on this meeting, and was extremely anxious to meet the cheesemakers of Wisconsin on this occasion. I know personally that he has been very much interested in the work of this convention and in its final success, and I am sure we all regret very much that Commissioner Emery cannot be with us.

The Chairman: As noted on the program, the election of officers is to take place during this session. We have decided to hold the election of officers now before the reading of the scores, for the reason that we have a large number of the

cheesemakers in attendance this afternoon. This is the cheesemakers' association, it is your convention, and it is up to you to elect your officers. I will call Mr. Aderhold, an ex-president of this association, to take charge of the election of officers.

Mr. A. E. Aderhold takes the chair.

The Chairman: We have to elect a president, vice-president, secretary, treasurer and a director in place of Mr. Grootemont. As I understand it, we are to proceed by ballot and as I understand it, the first ballot is informal. If there are no objections we will proceed with the understanding that the first ballot is informal. I will appoint as tellers: Messrs. Schwingel, Hickman, Coopman, Southard.

Does anyone desire to make a nomination?

Mr. Wallace: I take pleasure in naming Mr. John B. McCready to succeed himself for president.

Nomination seconded.

Mr. Larson: If there are no other nominations, I move that the rules be suspended and the secretary be instructed to cast the ballot of the convention for Mr. McCready.

Motion seconded and carried, and the ballot was so cast by the secretary and Mr. McCready declared elected president of the association for the ensuing year.

The Chairman: Nominations are in order for vice-president.

Member: I nominate Mr. Koehler vice-president of this association.

Mr. Koehler: I desire to withdraw my name as I will not be in the cheese business next year and probably could not do the asociation any good. I place instead the name of Mr. H. A. Chaplin, of Plymouth, in nomination.

Member: I nominate Mr. Jacob Karlen, Monroe, Wis.

Nomination seconded.

Member: I nominate Mr. Buchen.

Nomination seconded.

Mr. Buchen: I desire to withdraw my name. There are too many nominees from Sheboygan county.

There being no other nominations, the votes were called for and being counted by the tellers, the result was announced as follows:

Total votes cast, 107, of which H. A. Chaplin receives 63 and Jacob Karlen, 44.

Mr. Karlen: I move that the informal ballot be declared

formal and Mr. Chaplin be declared elected, the unanimous choice of the convention.

Motion seconded and carried.

The Chairman: The next is the election of a secretary for the ensuing year. Nominations are in order.

Member: I nominate Mr. U. S. Baer to succeed himself.

Nomination seconded.

The Chairman: Are there any other nominations?

Mr. Chaplin: I move that the chairman be instructed to cast a unanimous ballot for U. S. Baer as secretary for the ensuing year.

Motion seconded and carried and the ballot was so cast by the president, and Mr. Baer was declared elected secretary for the ensuing year.

The Chairman: Next is election of a treasurer to succeed Mr. P. Wallace.

Mr. Wallace: As I will not be in the state I cannot be a nominee for the office.

The Chairman: Your statement is very timely because if there is any one we do not like to have leave us it is the man with the money. Make your nominations, Gentlemen. Who do you want for a treasurer for the ensuing year?

Member: I nominate J. J. Reed, of Oconomowoc, Wis.

Nomination seconded.

Mr. Marty: I nominate Mr. F. Schwingel, of Madison.

Mr. Schwingel: I certainly very much appreciate Mr. Marty's nomination, but I do not expect to be in the state, therefore decline the nomination.

Member: I nominate Alfred Urben.

Member: I nominate Mr. Kasper.

Mr. Kasper: I desire to withdraw my name.

Mr. Urben: I also wish to withdraw my name.

Mr. Marty: I move that the nominations be closed.

Motion seconded and carried.

Mr. Buchen: I move that the rules be suspended and that the president be instructed to cast the ballot of the convention for Mr. Reed.

Motion seconded and carried and the president cast the unanimous vote for Mr. J J. Reed, who was declared elected treasurer for the ensuing year.

The Chairman: There is one director in place of Mr. John Grootemont. Make your nominations for director.

Alex Ochaller, P. H. Kasper and Axel Bruhn were nominated, and the vote being taken and counted by the tellers, the following result was announced:

Number of votes cast, 129, of which J. J. Reed received 5, Axel Bruhn, 46; Kasper, 58; Schaller, 20.

Mr. Bruhn: I move that the rules be suspended and the person receiving the highest number of votes be declared elected as director.

Motion seconded and carried, and Mr. Kasper was therefore declared elected.

The Chairman: I will turn over the chair to Mr. McCready, your president.

President McCready takes the chair.

The Chairman: Gentlemen, I wish to announce the committee on legislation as follows:

Messrs. U. S. Baer, Madison, Wis.; Alex Schaller, Barneveld, Wis.; Oscar Damrow, Sheboygan Falls, Wis.

I wish to say in making this announcement of your secretary; on the board a few years ago we used to obtain an appropriation from the state, which we lost through an error and we are anxious to get it back. I do not know of anybody in a better position to work that and be on the ground floor than Mr. Baer and I know we cannot work him too hard because he turns up every year just the same.

The next on the program is the reading of scores of those participating in the cheese contest, this will be read by Secretary Baer.

AMERICAN CHEESE.

Name	Address State	Flavor	Texture	Color	Make-up	Total
H. H. Graskamp	Loyal, Wis.	41½	26¼	15	9½	92¼
Arnold Grimm	Allenville, Wis.					
M. J. Gregorius	Appleton, Wis	41½	26¼	15	10	92¾
W. J. Cammers	Unity, Wis.	42	27¾	15	9½	94¼
G. A. Wegner	Eldorado, Wis.	40	26½	14¾	9½	90¾
G. F. Eichel	Rockville, Mo.	41½	25½	15	9½	91½
H. J. Kuschel	Manawa, Wis.	39½	26½	14¾	10	90¾
O. G. Rohde	Manawa, Wis.	41½	26½	15	9¼	92½
O. H. Swenink	Cazenovia, Wis.	42½	28¼	15	10	95¾
F. Schmidt	Reedfield, Wis.	42	26	15	10	93
Emil B. Horig	Hortonville, Wis.					
O. R. Schwentes	Sugar Bush, Wis.	42¼	28	15	9¾	95
John Cooper	Ogdensburg, N. Y.	41¾	28	15	9½	94¼
Frank Leitzke	Appleton, Wis.	41½	25½	15	10	92
H. W. Priebe	Kewaunee, Wis.	24¼	26¼	15	10	93½
John Roch	Pine Island, Minn.	42	26¾	15	10	93¾
Robert Naumann	Two Rivers, Wis.	42¾	28	15	10	95¾
E. B. Mayhew	Greenbush, Wis.	41½	27	14¾	9½	92¾
W J. Schlafke	Auburndale, Wis.	40	25½	15	9¾	90¼
E. H. Fischer	Belgium, Wis.	41½	27	15	9½	93
H E. Schneider	Luxemburg, Wis.	41½	27	15	9½	93
W E. Bidwell	Neenah, Wis.	41	26¾	15	10	92¾
E. A. Kraak	Avoca, Wis.	42	26	15	10	93
Anton Sc ller	New Holstein, Wis.					
Emil Boeing	Dodgeville, Wis.	42¾	27	15	10	94¾
Burt McKinney	Muscoda, Wis.	42½	27½	15	10	95
A. C. We h	Appleton, Wis.	44	29	15	9½	97½
J. J. Stocker	Dale, Wis.	42¼	27½	15	10	94¾
Lewis Falck	Morrison, Wis.	42¾	27	15	10	94¾
W. P. Stearns	Forestville, Wis.	42½	26¾	15	9½	93¾
A. C. Voigt	Spencer, Wis.	43	28¾	15	10	96¾
J. R. Biddulph	Tiskilwa, Ill.	42	26½	15	10	93½
J. R. Biddulph	Tiskilwa, Ill.	42	26	15	10	93
H. Price	Avoca, Wis.	42¼	27	15	9½	93¾
B. B. Moore	Dodgeville, Wis.	41¾	27¼	15	9¾	93¾
Mathew Meyer	Stanley, Wis.	42¼	27½	15	10	94¾
P. W. Knutson	Lancaster, Wis.	42½	47½	15	10	95
Mathew DeHaan	Lineville, Ia.	42	26¾	14½	9½	92¾
Harvey Holmes	Yuba, Wis.	42¾	27¾	15	10	95½
William Winder	Rock Bridge, Wis.	42¾	28¼	15	10	96
W. A. Bothwell	Darlington, Wis.	42	26½	15	9	92½
O. Knutson	Spring Green, Wis.	41½	27½	15	10	94
E. J. Maedke	Stanley, Wis.	42½	28	15	10	95½
Geo. Hoefler	La Crosse, Wis.	42½	27½	15	10	95
S. Blahnek	Kewaunee, Wis.	42¾	27¼	15	10	95
August Brandt	Forestville, Wis.	41	26	15	10	92
W. S. Walsh	Montford, Wis.	42	27	15	10	94
F. A. Viergutz	Appleton, Wis.	42	26¾	15	10	93¾
R. F. Kohlman	Fond du Lac, Wis.	42¼	26¼	15	9½	93
W. F. Bennin	Chilton, Wis.	42	26½	15	9½	93

BRICK CHEESE.

Name	Address State	Flavor	Texture	Color	Salt	Style	Total
Alex. Schaller	Barneveld, Wis.	38	36	10	5	4½	93½
Alfred Tschau	Oconomowoc, Wis.	37	37	9½	5	4½	93
Oswald Schneider	Appleton, Wis.	38½	38	10	5	5	96½
Patrick Carey	Hartford, Wis.	36	36	9½	5	5	91½
Arnold Grimm	Allenville, Wis.	37	36½	9½	5	5	93
Casper Anderegge	La Crosse, Wis.	36	36½	9½	5	4½	91½
Anton Sutter	Cambria, Wis.	37½	36	10	5	5	93½
John Wyss	Mt. Horeb, Wis.	36½	36½	9½	5	5	92½
L. E. Hasse	Juneau, Wis.	38	36¼	10	5	5	94¼
Gottfried Vogel	Monroe, Wis.	38	36	10	5	5	94
John Jenni	Cambria, Wis.	37	37½	10	5	5	94½
Alfred Urben	Blue Mounds, Wis.	36	36	10	5	5	92
John Steiner	Darlington, Wis.	37	36½	10	5	5	93½
Ulrich Furrer	Hollandale, Wis.	38	38	9½	5	5	95½
Robert Kohli	Knowles, Wis.	37	37¼	9¾	5	5	94

SWISS CHEESE.

Name	Address State	Flavor	Holes	Texture	Salt	Style	Total
Herman Schoepfer	Hollandale, Wis.	33	27	18	9½	5	92.50
Gottlieb Zumbrunnen	So. Wayne, Wis.	34	30	19½	9½	5	98.00
Gottlieb Zumbrunnen	So. Wayne, Wis.	34	27½	20	10	5	96.50
Alfred Urben	Blue Mounds, Wis.	35½	27	18	9½	5	93.00
Ulrich Furrer	Hollandale, Wis.	33	27	18	9½	5	92.50
J. F. Mani	Barneveld, Wis.	34	26	19	10	5	94.00
Alex. Schaller	Barneveld, Wis.	31	25	20	10	4	90.00
John Wyss	Mt. Horeb, Wis.	32	25	18	10	5	90.00
Carl Keusch	So. Wayne, Wis.	33	28½	19½	9½	5	95.50
John Emenegger	Dill, Wis.	34	27¾	20	10	5	96.75
Fred Emenegger	Ramona, Wis.	34	28½	20	10	5	97.50
Gottfried Saarli	So. Wayne, Wis.	33	27½	20	10	5	95.50
Albert Schlogge	So. Wayne, Wis.	33	27¼	20	10	5	95.25

LIMBURGER CHEESE.

Name	Address State	Flavor	Texture	Color	Salt	Style	Total
Franz Ehinger	Belleville, Wis.	35½	39	10	5	4½	94.00
Ernest R. Haessig	Monticello, Wis.	38½	39	10	5	4	96.50
Fred Deppeler	New Glarus, Wis.	37	36½	10	5	5	93.50
Henry Ruppert	Argyle, Wis.	38½	38	9½	5	5	96.00
Ernest Roth	New Glarus, Wis.	37	36½	10	5	5	93.50

Superintendent:
J. W. CROSS,
Mauston, Wis.

Judges:
J. D. Cannon, New London, Wis.
A. T. Bruhn, Madison, Wis.
Fred Marty, Monroe, Wis.

CHEESE SCORES.

U. S. BAER, MADISON, WIS.

Mr. President and Gentlemen of the Association: The following rules and instructions have been observed and lived up to by all those participating in the scoring contests.

Each cheese factory represented in the association has the privilege of entering the competition for premiums, and the pro rata fund, by the cheesemaker, one or more full cream cheese, the exhibit not to weigh less than twenty pounds, made at any time, unbored, giving the full data required by the entry blank.

Entry blanks and shipping tags will be furnished by the Secretary, U. S. Baer, State Capitol Building, Madison, Wis. Order entry blanks in due time and avoid delays.

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

Cheese should be shipped by express (charges prepaid) to the secretary, at Republican hotel, Milwaukee, Wis.

All cheese must be in the city not later than 10:00 a. m., Monday, January 9th. All express companies will deliver cheese promptly on Sunday, January 8th.

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 premiums 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.

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

Silver cups will be awarded to those exhibitors securing the first, second and third highest scores in the Swiss cheese class.

Silver cups will be awarded to those exhibitors securing the first, second and third highest scores in the brick cheese class. Silver cups will be awarded to those exhibitors securing the first, second and third highest scores in the limburger cheese class.

Each cup 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 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.

All cheese will be judged before the opening day of the convention. All premiums, diplomas, and pro rata money will be awarded to the exhibitors the second day of the convention. No disappointments in this.

$150 EDUCATIONAL CONTEST

Cheddars, Flats, Daisies, Specials, Picnics, Longhorns, Young Americas, Swiss, Brick, Linburger, Edam Gouda, Pine Apple, Cream, Neufchatel, Print, Etc.

The above cash premium will be awarded on the excess pro-rata plan to all entries scoring 92 points and above except prize winning exhibits which are not entitled to any part of the pro-rata premium fund. Exhibitors will be limited to one entry only in each class, except in the Swiss cheese class. Drum and Block Swiss may be entered in this class by all exhibitors. Entries from the same factory under different names or by different exhibitors, are prohibited. Cheese must be entered in the cheesemaker's name.

On all premiums amounting to $5.00 or over, fifty per cent. will be deducted if the exhibitor does not attend the convention.

Upon receipt of cheese at the exhibition hall, all tags, cards and markings will be removed by the Superintendent, and will be substituted by entry cards of the Association, designating number of entry.

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 each class will be retained as the property of the Association to be cut up and be distributed to those present, except in those instances where the 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 CHEESE

Scale of points for judging American cheese:

Flavor	45
Texture	30
Color	15
Make-up	10

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

Flavor	40
Texture	40
Color	10
Salt	5
Style	5

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

Flavor	35
Appearance on Trier (holes)	30
Texture	20
Salt	10
Style	5

The Chairman: The next on the program is the awarding of silver cups, diplomas and pro rata premium funds. Mr. Schwingel will lead in the discussion and in the meantime those diplomas will be ready for you.

I do not know of anything I can say in presenting the silver cups any more than God bless you and good luck to you, and that covers a whole lot. At the same time I think you appreciate the cups without any words of mine. I will merely hand them out to each winner as he comes up, with the best wishes of this association that he may win many more and keep this to remember that he was a winner at one time, at any rate. The winners of the cups are as follows:

American Cheese:

1. A. C. Werth, Appleton, Wis.	97.50
2. E. A. Voigt, Spencer, Wis.	96.75
3. Wm. Winder, Rockbridge, Wis.	96.00

Swiss Cheese:

Gottlieb Zumbrunnen, South Wayne, Wis.	98.00
2. Fred Emenegger, Ramona, Wis.	97.50
3. John Emenegger, Dill, Wis.	96.75

Brick Cheese:

1. Oswald Schneider, Appleton, Wis.	96.50
2. Ulrich Turrer, Hollandale, Wis.	95.50
3. John Jenni, Cambria, Wis.	94.50

Limburger Cheese:

1. Ernest R. Haessig, Monticello. Wis.....96.50
2. Henry Rupper, Argyle, Wis.....96.00
3. Franz Ehinger, Belleville, Wis.....94.00

The Chairman: The next on the program is a discussion "What is a Good Cheese" by Mr. F. O. Schwingel. Mr. Schwingel is instructor in American Cheesemaking at the University of Wisconsin.

WHAT IS GOOD CHEESE?

F. P. SCHWINGEL, Madison, Wis.

Mr. President, Ladies and Gentlemen of the Convention: I assure you that it is a great pleasure to have the honor of getting up here and speaking to you as well as yell to you. You have heard my gentle voice down there yelling and I assure you it is a pleasure to speak to you as well as yell.

I am greatly interested in your discussion on the improvement that we may make in Wisconsin cheese also the interest that is being shown by the cheesemakers of the state of Wisconsin. These prizes that we have here have been awarded to the successful cheesemakers of the state, and it seems to me that we are indebted to the cheesemakers for the loyalty they have shown to the convention, and their spirit in general. This is a great honor bestowed on each and every one who is worthy, we might say, of this prize given them, and we cannot give them too much to pay them for the earnest work they have done. While there is a great opportunity to meet here and exchange ideas and thoughts, when we go back we do not want to feel that just a few of us who have obtained prizes are worthy of them but we want to feel that we are all going to get prizes next time. I wish to compliment those that are successful this time and we certainly wish them success in the future and hope this may be a lesson to those who have not yet come up to that standard.

The hour is getting late. I had intended to speak in regard

to the scoring exhibitions and improvements, just touch on them, but as it is getting late I will say nothing along that line.

The subject given me is "What is a Good Cheese," and I have merely outlined a definition of what I would consider a good cheese, that is an American or Cheddar Cheese, and after the definition is given we will have up the prize cheese and part of the scoring cheese here to demonstrate the definition.

What is good cheese?

By way of explanation of what constitutes a good cheese, there are six factors generally considered in the definition, namely: Flavor, Aroma, Texture, Body, Color and Finish.

In order to be able to judge a good cheese it is necessary to be familiar with a certain characteristic flavor and make comparison with other objects in order to express thought in words that will carry an idea of what is meant.

It is quite a difficult matter to give a correct definition or express in words something that requires a great deal of practical knowledge and experience to attain. As near as I am able to define a good cheese, it should have a certain characteristic flavor, pleasing to the sense of taste, slightly acid, or rather tart effect upon the tongue and palate, leaving a fine, clean, nutty after-taste in the mouth.

The aroma should be pleasing to the sense of smell, not too high nor too low, but that which seems to have a mild, pleasing effect.

Texture and body generally come under the same term, but there is a distinction between the two. The texture should be such, that when a core is taken from the cheese it has the appearance of a candle, being smooth and silky, and when a small portion is mashed between the forefinger and thumb, the body should be such that it will mould down like wax having a smooth waxy or slight velvety effect to the sense of touch. When the core is bent and breaks, it should break square and flinty, resembling a broken piece of steel.

Color,—it should be uniform throughout the entire cheese. When a core is held to the light it should be translucent or what is generally termed as partially transparent.

Finish,—the finish or general appearance of the exterior portion of the cheese should be a smooth rind, having a clean close fitting bandage with an even edge that is straight and square.

Judging and Method of Scoring Cheese.

Practical Demonstration.

I have merely outlined what I consider an ideal cheese, and I think the great trouble is that cheesemakers have not this ideal cheese in mind and I believe it is to the interest of those who are familiar with the ideal cheese to try to explain to those that are less familiar, and make it as clear as possible in ideals that will mean something to them. We have the prize cheese here and we also have low scoring cheese. This cheese will be passed among you a little later and you will be able to judge for yourself what constitutes a good cheese and some of the defects in a poor cheese.

The method of judging and scoring cheese is something that we might say is the opinion of the fellow that is scoring it. We have certain points to follow: we have to use our eye sense, the touch sense, the smell, and the taste, before we are able to judge a cheese. There are a great many different ways that we may start to score and judge a cheese and I do not wish to go into too long an explanation because our time is limited, but in scoring a cheese, we should have a trier that is at least 5-8 to 3-4 of an inch in diameter and one that will reach at least to the center of the cheese, and we should insert the trier at an angle that will allow it to be easily drawn out. In turning the trier we should turn it far enough to get a quarter turn over the half so as to twist the plug of cheese at the end of the trier off, and when you draw the trier out you get the entire plug. A great many try to plug the cheese by twisting the entire trier clear around. This sometimes breaks the plug of the cheese and we are not able to get the entire length of the cheese. I think from the definition I have given you, it will not be necessary for me to go into every detail to explain what the ideal cheese looks like. Whenever I am asked to score a cheese or judge a cheese, I think that the old fellow whose opinion was asked of good cheese. "Well," he said, "when it looks all right, tastes pretty much good and smells much better, I think it would be all right;" and that is what I think about a cheese.

Regarding the defects in a cheese, I think if we could spend a short time in discussing what are some of the defetcs in cheese, it might be of some interest to those who are less familiar with the cheese subject. The prize cheese, as decided by the judges,

is scored clean, very fine texture, body is smooth, silky and waxy and the color is perfect. That does not require any further explanation as to an ideal cheese. Now we have also the low scoring cheese. The total score of premium cheese was 97½ points, while the low scoring cheese was 84, and here we have the flavor described as tainted, bitter, sharp, texturer and body has large mechanical holes, some gas, sweet holes.

I have not prepared any talk on the defects of this poor cheese. If there are any quetions regarding some of the defects we will have a few minutes talk about them, and then the prize cheese and poor grade of cheese will be passed among you and you can judge for yourself.

The Chairman: I think you will be anxious to taste this cheese and will not care to ask questions. I would suggest that as the cheese is passed among you to taste the good cheese and poor cheese so as to note difference, I would suggest that you take the poor cheese first so you will have kindly feelings.

(Cheese is passed through the audience.)

The Chairman: We will now adjourn for today but we will ask you to stay and enjoy the cheese and get acquainted until such time as you are fully satisfied. You can get your diplomas and pro rata money now.

FRIDAY MORNING SESSION.

Meeting called to order at 9:30 o'clock by President McCready.

The Chairman: The first on the program this morning is a paper on Swiss Cheesemaking by Mr. Alex Schaller.

SWISS CHEESE MAKING

ALEX SCHALLER, BARNEVELD, WIS.

Mr. President, Ladies and Gentlemen: Having the honor to be placed on your program to express my ideas on the manufacture of Swiss cheese, at the same time I will take the opportunity to express some ideas with regard to keeping in harmony with the patrons, and to get the best milk. Every cheesemaker wants good milk, because it lessens his labor, keeps up his reputation as a cheesemaker and in every way that can be enumerated it is to his advantage. Let him therefore use some of his energy in obtaining a pure milk supply outside, and he will not have to use so much energy in remedying troubles inside. As most of our cheesemakers are paid a percent for making, it is to our benefit to educate the patrons to bring pure, sweet, clean milk. Educate them by kindness and not by force. Take the Wisconsin curd test and show them what kind of material they are bringing to you, and what kind of cheese you get out of it. I try to impress upon the minds of my patrons, the idea that we are jointly interested in each others welfare, and are banded together for the purpose of getting the most money we possibly can out of our products, and make them realize that we are all on equal footing, and I aim to prove this by my actions.

I will try and explain to you gentlemen, in a few words, the manufacturing of Swiss cheese. It will take the maker years of practical experience, and I am safe to say it requires skill and good judgment also to be a successful cheesemaker.

After the milk has been received, heat slowly to 91 or 92 degrees fahrenheit, keeping the milk stirred all the time heat is going on the kettle; now use enough rennets to curdle the milk

fit for cutting in about 20 or 25 minutes. I want to state that we use home made rennets from 24 to 34 hours old. These rennets have to be tested every time before setting. When the curd will break clear over your finger, commence cutting. It is cut mostly with the wire harp. 15 to 20 minutes is given for the whey to expel from the curd before cooking. The heat is then applied slowly, to heat it up in about 25 or 30 minutes, to about 130 degrees fahrenheit; this curd is stirred all the time until the maker finds it firm enough to dip, the curd is then dipped from the whey all in one lump, and then put on the press in one lump, where the cheese is turned every two hours during the day, and kept under continuous pressure for 24 hours. From the press the cheese is put into a tank containing salt brine, strong enough to float it, and remains there for about three days, depending on the size of the cheese. After this the cheese is placed on the shelves to cure, under continuous dry salting every other day. The cheese is taken from the shelves to the table, turned, washed, and salted for at least two months, before our cheese is put on the market.

I want to impress on you that very careful attention must be paid during the curing process, as this is where a great many are careless and lose their reputation.

Furthermore I want to say that only a small number of Swiss cheesemakers attend these conventions, many of them say it doesn't pay to spend so much money, but I will say that those "Cheesers" don't know any better. The cheesemaker who is satisfied to go on in the same old way, is the man who gets the most No. 2 cheese, I want to say to that kind of cheesemaker: come here and attain that knowledge of other practical makers, and after the first meeting you will say, I am glad I came, and it pays to exchange ideas with successful makers. Come the first time for the fun of it, after that you will make up your mind it is your duty to come and try to bring your friends along with you. I thank you.

DISCUSSION.

The Chairman: You have heard Mr. Schaller's paper. Are there any questions you would like to ask him in regard to the manufacture of Swiss cheese?

Member: I would like to ask Mr. Schaller how he can stop a cheese forming these round holes? I have noticed in some southern cheese factories they have close cheese and they have great trouble to get the holes of the right kind.

Mr. Schaller: I work the curd a little longer in the morning, that is where we get the close cheese. When the curd is worked longer, twenty-five or thirty minutes longer, then you get more open cheese.

The Chairman: If there are no further questions that you would like to ask Mr. Schaller in regard to Swiss cheesemaking, we will proceed to the next paper.

The Chairman: We will now have an address by Prof. J. L. Tormey, of Madison, Wis., "Milling By Products for the Dairy Cow."

MILLING AND FACTORY BY-PRODUCTS FOR THE DAIRY COW.

J. L. TORMEY, MADISON, WIS.

Instructor in Animal Industry, Agricultural Experiment Station.

Before the advent of the chemist and feeding investigator into our practical application of scientific feeding knowledge, the feeder fed his animals the grains and grasses without knowing or apparently caring from whence the animals derived benefit or why the feeds produced the desired effect. As opposed to the above, the present day average man of the fields speaks with almost familiar freedom of protein, carbohydrates, fats, digestible nutrients, feeding standards, balanced rations, and food requirements.

The chemist, by analysis, has shown us the different constituents necessary for the fulfilling of certain important body functions as well as for the performance of work and the production of fat or milk. He has also shown us the amounts of various elements necessary to nutrition contained in certain feeding substances; and by the combination of these two important bits of information and applying them in a practical way the farmer has been enabled to utilize what were formerly thought to be valueless by-products of certain technical operations in mill and factory.

America has been termed "The Land of Waste," and the utilization by the feeder of what were once considered waste products is only one of the forerunners in the great problem of conservation. The impoverishment of wheat and cotton fields was due not alone to the withdrawing of the products which were primarily demanded for general utility, but to the non-utilization of the by-products in the manufacture of the commodities. Untold fortunes from flour mills were literally cast upon the waters, and an unestimated wealth of natural resources was alowed to rot around cotton gins alone. Thanks to our modern investigation these sources of waste have been turned into sources of wealth and an attempt on the part of man to approach nature's method of conserving elements necessary for life has in recent years opened up a new field of feeding stuffs of great value to live stock.

The investigator has cleverly shown us the elements found in milk; he has also determined the constituents necessary in a feed to produce these elements, and by a minute study of the life processes and changes going on within the animal he is enabled to formulate standards or guides to be followed by the feeder. This knowledge in connection with practical tests for specific results has enabled us to get accurate information as to the feeding value of various products.

Today the greatest sources of our so-called commercial feeding stuffs are the by-products of mills and factories; and these feeds are known as milling and factory by-products.

In feeding the dairy cow the primary consideration is to furnish material for the production of milk. The dairy cow differs from the meat animal in that she not only has to maintain her own body—i. e., cary on all the life processes of

breathing, masticating, digesting, and assimilating food, repairing broken tissue and destroying waste products—but she must also produce a food material richer in some of the most expensive and essential constituents than is her own flesh. Milk is destined primarily as an ideal feed for the young growing animal whose tissues must be built and so is a material proportionately high in protein. An analysis of normal cow's milk shows it to contain

87.3% of water
3.4% of protein
3.7% of fat
4.9% of sugar and
0.7% of ash

Or on the basis of digestible nutrients according to Henry's "Feeds and Feeding" it contains

12.8% digestible dry matter
3.4% protein (digestible)
4.8% carbohydrates (digestible) and
3.7% fat (digestible)

Milk is also high in fertilizing constituents, containing in each 1000 pounds

5.8% of nitrogen
1.9% of phosphoric acid and
1.7% of potash

The contituents or elements necessary to form them must be supplied in the ration of the animal if normal production and the retention of the cow in normal condition are expected.

A reference to the digestible solid constituents of milk shows that when compared with the sum of the carbohydrates and fat constituents (x2.25) the protein stands in the ratio to those constituents as 1:3.85. That is for each unit of protein energy in milk there are 3.85 units of energy derived from the combination of carbohydrates and fats. Thus we see that to produce milk we must supply an abundance of protein and ash constitutents in our ration.

Our ordinary roughages grown on the farm—timothy hay, corn stover, and straw—are low in protein and high in crude fiber material, which is a carbohydrate hard to digest. The

legume roughages—the principal ones in our section of the country being alfalfa and medium red clover—are comparatively high in protein and form the best hay roughages for dairy cattle.

Our cereal grains corn, wheat, oats, barley, and rye are high in carbohydrate material and not relatively high in protein. It then behooves the dairyman, if he wishes to get the greatest reproduction economically without unduly taxing the cow, to cast about for some protein-rich supplements for the ordinary farm grown feeds.

The by-products of flour mills, oil factories, sugar and canning factories have opened up to the farmer a new world of valuable feeds, which furnish the bulk of our commercial feeding stuffs at the present time. By-products are, technically speaking, the residues from factories operated primarily for

(1) The milling of grains for flour production;
(2) The manufacture of cereal foods;
(3) The manufacture of alcoholic liquors;
(4) The manufacture of starch and glucose;
(5) The manufacture of sugar; and
(6) The extraction of oils.

In the milling of grains there is perhaps no feed more valuable to the dairyman than is wheat bran. Bran consists of the three external seed coats of the wheat kernel, beneath which is the aleurone layer, which is the richest part of the wheat grain in protein and ash. The three outside coats are largely crude fiber. This, fortified by the protein rich aleurone layer, beneath makes bran at once a light flaky feed high in protein. Bran is high in phosphorous and is not only valuable as a dairy cow feed, but is rich in returning a valuable source of mineral constitutents to manure for impoverished soils. The value of bran consists in the relative amount of the inner coats it contains and also in its freedom from adulterations such as mill sweepings and screenings. Coarse bran, if of good bright quality and pure is the best, as it renders necessary somewhat more mastication and is more thoroughly digested by the ruminating animal. Bran has a slightly laxative principle, due to the presence of 6 or 7% phytin, a com-

pound of phosphorous, magnesia, and potash. It was formerly thought that this laxative effect was due to the slight irritation of the digestive tract caused by the rough flakes of the bran. According to Henry's Feeds and Feedings wheat bran contains 11% of protein, 42.0% of carbohydrate material and 2.5% of fat—all digestible. Winter wheat bran is somewhat higher in digestible protein and fat and lower in digestible carbohydrates while spring wheat bran is somewhat higher in digestible carbohydrates and fat than the average. Wheat bran is at the present time perhaps the commercial feeding stuff most commonly purchased and used by the practical dairyman. Although it is not absolutely essential to a good dairy ration, it can well be made from 20% to 50% of the concentrate or grain mixture of the dairy cow's ration; or from 2 to 5 lbs. may be fed in connection with other concentrates to make the total grain feed conform in general to the popular "rule of thumb" adopted by dairymen, viz., "Feed as many pounds of grain daily as the cow produces pounds of butter fat per week or from ¼ to ⅓ as many pounds of grain as the cow produces pounds of milk."

Although bran is percentagely somewhat higher in protein than the cereal grains, it should not be chosen as a source of protein only, but as a good, useful feed. It should also be remembered that it is not to be considered as a more convenient source of nutrition than the cereals because the most valuable part of the carbohydrate material of the wheat grain has been taken to form flour and the carbohydrate material in the bran consists to a great degree of crude fiber material, which is not as available to the animal as is starch. Bran, though for short periods a valuable feed alone, should not be fed alone, but always in combination with grains if possible and with leguminous roughages to supply lime, in which mineral constitutent bran is low and which is absolutely essential for normal milk production.

Professor Woll of Wisconsin found that oats was somewhat more valuable pound for pound for milk production than was bran. The relative price of different feeds should often determine the choice of the one to be fed.

Middlings is another by-product of the process of wheat flour manufacture and, as the name implies, is a medium be-

tween bran and flour. That is, it contains some of the finer particles of bran and coarser portions of flour or some of the lower grades of flour not pure enough as far as color is concerned. They are somewhat higher in digestible nutrients than is bran, but for dairy cattle and ruminating animals in general have never attained the popularity of bran, due to the fact that they form a pasty mass in the animal's mouth and can not be so thoroughly masticated. They should never be fed alone, but in combination with ground corn, oats barley, or other by-products. Though not advised to feed alone, as 20% of the grain ration, they are of equal value with bran and somewhat cheaper than linseed meal.

Flour middlings contain somewhat more of the low grade flour and are somewhat higher in total nutrients than are standard middlings.

Shorts is a term often used interchangeably with middlings, but they often contain too much adulteration in the shape of sweepings and screenings and are not of as standard quality and feeding value as are middlings.

Red Dog. "Red Dog" sometimes known as dark feeding flour is a grade of flour not pure or clean enough to sell as a good cooking flour, but is dark colored and sometimes flecked, due to the presence of minute particles of bran and parts of germs. It is higher in all the digestible nutrients than is bran, but it is not a desirable feed for dairy cattle because it contains somewhat to much gluten, which forms a sticky mass in the animal's mouth and cannot be well masticated.

Buckwheat Middlings. In the manufacture of buckwheat flour the coarse, woody hulls on the outside have but little feeding value and should be rejected. That part, however, beneath the hull, which is rejected from the flour, and forms what is known as buckwheat middlings is of very high feeding value, and is considered one of the best sources of protein the feeder can get. However, buckwheat by-products should be chosen only on the relative amount of the different constituents they contain because the dealer in wishing to rid himself of the woody hulls mixes them with the middlings and sells the product as buckwheat bran.

The value of buckwheat bran will depend directly upon its freedom from the undesirable hulls. Buckwheat middlings

have the reputation of being excellent feed for dairy cattle, producing a large flow of milk. They are charged with producing a white, tallowy butter, which trouble, however, may be avoided if the middlings are not fed in too large quantities. Onee objection t obuckwheat by-products is that they heat when stored in large quantities. They should never be fed alone but should be fed in connection with other ground feeds, and can well form 20 per cent of a good grain ration for dairy cattle. Wheat bran is a valuable by-product to mix with them to lighten them.

Rice By-products. In the preparation of commercial rice, the hulls are removed by burrs somewhat similar to those used in grinding wheat and the pressure put upon the rice would be sufficient to grind our ordinary cereal grains. The rice grains which remain are then polished and the dust which comes from polishing is known as "rice polish." This has a feeding value almost equal to corn, but is not sold as a feeding stuff to any great extent, due to the fact that it is utilized to a considerable extent in the manufacture of buttons and as a carrier of perfumes in toilet powder manufacture. The "rice hulls" are tasteless, tough, and woody, and are very injurious to the digestive tracts of animals. They should never be fed to farm animals and when used as an adulterant lessen the value of the product with which they are mixed. "Rice bran" is composed of the outside layer of the rice grain proper, together with some of the germs and some rice hulls used as an adulterant. The pure bran does not contain the rice hulls and is properly called "rice meal."

The value then of rice bran or meal depends upon its freedom from these adulterations. Where these by-products can be easily obtained the feeder can utilize them to quite good advantage. Rice meal and rice bran often contain "grits" which are portions of the rice grain broken during the preparation process. Although they are good sources of feed and do not detract from the total nutrients to any great extent, they are so sharp and hard that they are disagreeable to the animal.

Cereal By-products. The manufacture of the so-called cereal foods, such as oat meal, hominy, and pearl barley has given rise to a series of by-products known as "cereal by-products," the commonest ones being oat hulls, barley feed, and hominy chops

or hominy feed. The oat hulls contain about 30 per cent of crude fiber and their feeding value is a little above that of the common oat straw. The clever dealer, therefore, does not attempt to sell them as feeds, but used them as adulterants, often selling them in connection with corn as ground corn and oats. The value of the ground corn and oats will depend relatively, as far as digestible nutrients are concerned, upon the freedom from large amounts of oat hulls.

In the manufacture of oat meal the fine hairs at the end of the oat kernel are broken off and with small particles of the oats form "oat dust," which is somewhat more valuable than oat hulls. "Oat middlings," of course, consist of the outside layer of the oat kernel proper with some of the starch material beneath. Oat middlings are somewhat higher than bran in total nutrients, are quite high in feeding value and can be utilized very advantageously and safely by people living in the vicinity of oat meal factories.

In the manufacture of hominy and brewers' grits, the outside coating of the corn is removed as well as the germs. These mixed together are sold as hominy chops. They are quite high in fat and carbohydrates and fair in protein. They have been found to be equal to wheat bran when fed in a dairy ration constituting about 20 percent of the grain mixture.

By-products from the manufacture of alcoholic liquors. The by-products from the technical processes in the manufacture of beer and other alcoholic beverages constitute some of the most important commercial feeds at the disposal of the dairy cattle feeder. In the manufacture of malt, the barley grains from which malt is made are first steeped in warm water, then spread over a thin surface and kept at germinating temperature until the seeds begin to sprout. The purpose of this is that in the processes of growth, the starch which is insoluble is changed into sugar, which is soluble, and the fermentation of which produces alcohol. Now, at this stage in the malting process, the grains are dried and the small sprouts are removed. These are known as "malt sprouts."

The malt sprouts being the growing portion of the young plant are exceedingly high in digestible crude protein, containing about 20 per cent, but are low in carbohydrates and fats. They are not relished to any great extent by cattle, and cows

should not get more than 2 or 3 pounds a day. Malt sprouts have the peculiar faculty of absorbing large quantities of water and should be soaked several hours before feeding.

The brewer is interested only in the amount of carbohydrate material which he can extract from barley grains. The other material is all sold as a by-product material. After the sugar has been extracted from the malt the material left consists of what is known as "Brewers' Grains," a by-product material relatively high in crude protein and fat and low in carbohydrate material.

The wet brewers' grains are bulky, contain a high percentage of water, ferment readily, and will not stand transportation, and consequently, are usually fed near the brewery.. A great deal of adverse comment has peen passed upon the feeding of wet brewers' grains. However, the fault is not in the wet grains themselves, but the unsanitary conditions under which some unscrupulous dairymen have fed them has led to the production of milk tainted by bad odors and in some instances, the feeding of large quantities has led also to undesirable results as far as the maintenance of the health of the cows is concerned. If fed in good clean sanitary troughs, built of cement, which can be kept clean, and the grains are not allowed to lodge in corners, become sour, and ferment, wet brewers' grains can be utilized very advantageously by the man living in the vicinity of the brewery. Wet Brewers' Grains contain about 75 per cent of water.

Dried Brewers' Grains. When wet brewers' grains are dried by a vacuum process, all but about 9 per cent of the water is extracted, and a very dry, palatable, nutritious feeding stuff is obtained. When dried in this manner, brewers' grain can be transported and kept as long as wheat bran. They contain over twice as much digestible crude protein as corn, and about 50 per cent more digestible fat. When they can be bought reasonably, they form an excellent feed for dairy cattle, having a great many of the properties of bran, containing sufficient crude fiber to make them desirable for the ruminating animal. They have been found to be somewhat superior to wheat bran for milk production and to equal buckwheat middlings. Dried brewers' grains can easily form from 20 to 50 per cent of the grain ration for dairy cattle.

Distillers' Grains. In the manufacture of alcohol and the distillation of spirituous liquors, corn and rye are principally used, although alcohol is obtained from any highly carbonaceous seed or other part of the plant. The distiller is interested only in the starch or carbohydrate material which in the process of manufacture can be changed to sugar and alcohol ultimately formed.

The by-product whichc omes fresh from the distilleries is very high in water and is termed distillers' slop. Due to this high water content, it can be utilized for feeding purposes to good advantage only near the distillery. The charge has been made that distillers' slop is not a good feed for dairy cattle; however, this charge is unwarranted if care is exercised in maintaining proper sanitation.

When these distillers' slops are dried and not more than 7 or 8 per cent of water is present in the grain, there is left a by-product known as "Dried Distillers' Grains" which is one of the most palatable and nutritious and valuable dairy feeds in the whole list of by-products. Dried Distillers' Grains often sold under the name of Ajax Flakes are somewhat higher in digestible crude protein than are dried brewers' grains, and contain almost three times as much fat as corn. The grains which come from the manufacture of alcohol from corn are the most valuable of any as a feeding stuff. The crude fiber material which is not utilized by the distiller serves to lighten the dried distillers' grains and makes them very palatable for the ruminating animal, due to the fact that it renders necessary more mastication. They are considered by good dairymen as one of the best commercial feeds to add crude protein and fat to the ration of the dairy animal.

Dried Distillers' grains can very profitably be made from 20 to 40, or even a higher per cent, of the dairy cow's ration. The grains have been found by experiment to be worth 50 per cent more than wheat bran or milk production and some feeders prefer Dried Distillers' grains to oil meal or cotton seed meal.

Starch and Glucose By-products. In the manufacture of starch and glucose from corn a series of by-products which are often profitably utilized by the feeder of dairy cattle remain. The most common of these are corn bran, germ oil meal, gluten

meal, gluten feed, and by-products under the commercial name of sugar feed and starch feed.

The corn bran consists of the hull, the bran, that is, particles of the layer beneath the hull, and some light weight and broken germs, all of which have been separated from the starch and gluten of the corn by a bolting process in the extraction of the starch and gluten from the corn kernel. These materials are pressed and dried and placed on the market in that form.

In the manufacture of starch, after the corn has been soaked in dilute acid to render a separation of the different parts of the kernel somewhat easier, the germs are removed by degerminating machines. The germs are then dried and pressed and the oil crushed out. The remaining residue is known as "germ oil cake," or is ground and sold in this country as "Germ Oil Meal."

Germ oil meal. Germ oil meal is twice as high in digestible crude protein and mor than twice as high in digestible fat as is corn. It also carries a fair percentage of mineral constituents. Germ oil meal for dairy cattle has been found to be somewhat more valuable as far as production is concerned when fed with bran than are equal parts of cotton seed meal and linseed meal fed with bran, and has safely formed 50 per cent of the cow's ration.

The gluten grains in the corn are separated from the starch material in which the manufacturer is principally interested by a gravity process. That is, the starch and gluten, after having been bolted from the bran and the coarser particles of the ground corn kernel, and after the germs have been removed, are floated in water. The heavier starch material sinks to the bottom, while the gluten material is carried off in suspension. The gluten grains are then concentrated, pressed, and dried, and appear as gluten meal. Gluten meal is one of the highest protein and fat containing by-products, containing almost 30 per cent of digestible protein. However, it is such a concentrated feed that it is not utilized in its original state to any great extent, but is now largely ground with corn bran. The combination of these two forms what is known as gluten feed, which is the most extensively sold by-product in the manufacture of glucose.

Gluten feed contains about he same amount of digestible

crude protein and about half as much digestible fat as dried brewers' grains. It is, however, a very palatable and nutritious dairy cow feed and when forming one-half of the grain ration and substituted for an equal amount of corn meal and bran, it increased the flow of milk 15 per cent. Good quality of gluten feed may vary safely from 20 to 50 per cent of the concentrates fed the dairy cow. However, gluten feeds are often adulterated with coloring matters, which, although perhaps not directly injurious to the animal, render the feed somewhat less palatable and the careful dairyman should insist upon the unadulterated gluten feed.

"Sugar feed" and "starch feed" are terms applied to more or less miscellaneous by-products consisting largely of the hulls and germs together. Their value as feeds will depend largely upon their chemical composition and the relative amounts of hulls and germs which they contain.

By-products of Oil Extraction. From the manufacture of cotton seed oil from the cotton seed, and linseed oil from the flax seed the dairyman obtains two of the most valuable commercial by-products which the market affords. These are cotton seed meal and linseed meal. Properly speaking, these are both oil meals, but, due to the commonness with which linseed oil meal is used as a feed, the term oil meal, especially in this section of the country, has come to mean, to the average farmer, linseed oil meal.

In the manufacture of linseed oil, two general processes of extraction are used. In the "old process," the oil is extracted by pressure and residue which is left is in the form of cakes which are known as "oil cake." This cake is ground into what is known as old process oil meal or it may be very coarsely ground into what is known as the nut cake.

In the manufacture of oil meal by the new process, the seed is first crushed and ground and placed in large percolators or vats. Naptha, a volatile oil, is next poured over the crushed seed and the linseed oil extracted by it in solution. The naptha is then driven off from the residue by steam, and the remaining residue is known as "New Process" oil meal. Due to the fact that the oil is somewhat more completely extracted in the new process, it is somewhat higher in protein than is the old process, but is considerably lower in fat. However, because the new

process oil meal has been acted upon by steam, the protein is about 10 per cent less digestible than that of the old process.

The most of the linseed oil in this country is extracted by the old process so that the most of the linseed oil meal that is placed upon the market is old process oil meal, and, unless otherwise specified, the term "oil meal" is generally used to signify old process oil meal. There is perhaps no by-product feed which in limited quantities is more valuable to the ration than is oil meal. However, it should always be fed in combination with a grain mixture on account of its peculiar physical properties. If ground finely and fed alone, it tends to form a rather pasty mass in the cow's mouth, which renders it somewhat difficult to masticate. Many people prefer the nut form because this necessitates more thorough chewing by the animal and adulterations are not as easily added. The oil which oil meal contains is slightly laxative in character and is very conducive to keeping the digestive tract in good order and promotes the general well being of the animal. A good dairy ration may well contain about 10 per cent of oil meal.

Cotton Seed Meal. Throughout a great part of our country there is perhaps no by-product that, from an economical point of view, can assume the gigantic proportions as a feed that is assumed by cotton seed meal. Prior to the Civil War, vast worlds of wealth in the shape of cotton seed were allowed to go to ruin around the cotton gins. Not only the loss of the cotton seeds themselves and valuable feeding nutrients which they contain resulted from this wanton waste, but southern soils were sadly depleted by the indiscriminate loss of valuable fertilizing constituents contained in the seeds. The production of cotton is an industry which as practically made certain agricultural sections of the south one of the richest in the world, as far as actual money receipts from the tilling of the soil are concerned, and as it was indiscriminately practiced prior to 1860 one of the poorest sections of the world from an agricultural standpoint. The annual crop of the United States now amounts to over six billion pounds of cotton, which produces over twelve billion pounds or six million tons of cotton seed as a by-product. In every ton of cotton seed there are about 732 pounds of cotton seed meal, so that there are annually produced throughout the cotton belt of America practically two and one-

fourth billion pounds of cotton seed meal. Reckoning the price of cotton seed meal at about $35.00 per ton, cotton seed meal salesmen annually realize from thirty-five to forty million dollars from the sale of cotton seed meal.

Cotton seed meal may well be termed the principal concentrate fed used by dairymen in the southern sections of the United States. The ordinary dairyman throughout the corn belt feeds it with extreme freedom, so far as amounts are concerned, in many instances making it the sole concentrate in the dairy ration and feeding as high as seven or eight quarts per day per cow. It has been found that in certain sections of the south cotton seed meal and corn silage constitute a cheap ration. Cotton seed meal is charged with producing a hard, tallowy butter, light in color and poor in flavor, if cows are fed excessive amounts. However, from three to four pounds per day mixed with other lighter concentrates such as bran, ground oats, and corn meal, and with such roughages as corn silage, alfalfa, or medium red clover hay, or, if the cows have good pasture, the possibility of producing an undesirable butter is practically eliminated; and when fed in that way, the butter is not materially affected by the addition of the cotton seed meal. Cotto seed meal is one of the best digestible protein urnishers that the market affords; it is also high in fat, containing practically five times as much digestible protein and over twice as much digestible fat as does corn.

The Mississippi Station found one pound of cotton seed meal equal to two pounds of corn and cob meal for milk production, and the Vermont Station found it somewhat more valuable for milk production than linseed meal. It has also been found by test when fed in connection with corn silage and corn stover to be worth from one and a half to two times as much as wheat bran. There is, however, some difficulty of overfeeding from cotton seed meal on account of its intensive concentration. The Texas Station found six pounds of cotton seed meal gave better results than larger amounts of from seven to ten pounds per day.

The value of cotton seed meal depends to a great extent upon the process of extracting the oil from the cotton seed, the cotton seed meal being a by-product of such extraction. At the oil mills the tough, leathery hulls which enclose the cot-

ton seed and which are covered with fibrous lint are cut away, leaving the oily kernels free. These are then crushed, heated and placed between cloths and subjected to hydraulic pressure which squeezes out the oil, leaving a residue which is known as "cotton seed cake." The cotton seed cake is ground to form cotton seed meal. "Decorticated cotton seed cake is of the best quality, practically free from hulls and is of higher feeding value than "undecorticated cotton seed cake," which contains some hulls ant the feeding value of which depends upon the relative amounts of hulls which have been introduced or not removed. "Cold pressed cotton seed cake" is produced by subjecting the entire seed to great pressure and contains the hulls and consequently is of lower feeding value than is the cotton seed cake from which the hulls have first been removed. Cold pressed cotton seed cake is considered to be worth about two-thirds as much per ton as is cotton seed meal.

Dried Beet Pulp. The manufacture of sugar from the sugar beet is an industry assuming gigantic proportions in certain sections of our country. The manufacturer is interested only in extracting all the sugar possible and there remains a residue or by-product known as wet beet pulp containing in the fresh state 90 to 95 per cent of water and when pressed 85 to 87 per cent of water. The sugar beet pulp in this condition compares favorably with roots for feeding, but on account of the high water content the beet pulp cannot be transported, but is usually fed near the sugar factory. The Colorado Station found a ton of wet beet pulp had about the value of 200 pounds of corn or 1 pound of corn was worth 10 pounds of wet bet pulp. Wet beet pulp sours readily, but this does not lower its palatability for cows. The quality of milk produced by wet beet pulp is good.

Wet beet pulp is sometimes ensiled but it has been found that it loses more than one-fourth of its nutrients. Because of the high cost of concentrates and the popularity of dried beet pulp the ensiling of the pulp is losing its popularity and factories are being equipped with facilities for drying the pulp.

Dried beet pulp is a by-product of vast importance, and as it contains only about 8 or 9 per cent of water it can be transported over great distances without deteriorating in value. For

feeding value one pound of dried beet pulp is worth eight pounds of wet beet pulp. Dried beet pulp is low in protein and high in carbohydrates. Since most of the sugar has been removed, the value of the carbohydrate material remaining is of doubtful feeding value.

The Wisconsin Station found that dried beet pulp was worth about two-thirds as much as wheat bran. The material is sometimes softened with water before feeding and good results were secured—about 9 or 10 pounds daily can be fed safely to cows.

Molasses beet pulp is another by-product of beet sugar manufacture which is of no great value as a feed. It is utilized sometimes by pouring it over beet pulp and the two by-products fed in combination. It adds palatability, but no increased nutritive effect.

Cane Molasses is a by-product of cane sugar manufacture and is a valuable feed in certain sections and is rated as of equal value with corn. It is not only palatable, but it is even claimed to increase the digestibility of materials fed with it; but no advantage is to be derived from feeding it to dairy cattle in our sections other than that it renders the grain ration somewhat more palatable.

By-products open up to the dairy man a vast field of available feeds which can often be utilized. The feeder should not, however, lead himself to imagine any miracles from their use more than he derives from any good rational feeding. For the farmer some by-products mixed with the ordinray farm grains, preferably corn, oats, or barley, are valuable. Oftentimes though the man who raises no grain may find it to advantage to choose an entire mixture of by-products and should then better use a mixture of two or three varying chemical and physical properties rather than select either those of extremely high or low concentration.

The following grain and by-product mixtures have been found valuable at the University of Wisconsin:

1. 20% ground oats
   20% ground corn
   20% wheat bran
   40% dried distillers' grains.

2. 30% wheat bran
   30% dried distillers' grains
   40% corn meal.
3. 30% wheat bran
   30% ground oats
   20% corn meal
   20% ajax flakes.
4. 40% wheat bran
   40% ajax flakes
   20% cotton seed meal.

Note the last mixture is composed entirely of by-products.

The Chairman: Are there any questions you would like to ask Mr. Tormey? If not be will take up the next subject on the program, by Mr. E. G. Hastings, of Madison, Wis. "Some Methods of Improving the quality of our Milk."

SOME METHODS OF IMPROVING THE QUALITY OF OUR MILK.

PROF. E. G. HASTINGS, MADISON.

Agriclutural Bacteriology, University of Wisconsin.

Mr. Chairman, and Gentlemen: This convention meets today in a city in which are located some of the greatest breweries of the world. Now if you were to visit one of these breweries while you are in the city and going through it you should ask the guide what determines the quality of the product that they made, you would be answered something like this: They would tell you that the brewer must pay attention to the raw material which he uses in making the product. For instance, he must pay attention to the hops which are used in making the beer and he must pay attention to the water which is used in making it, and lastly he must pay special attention to the kind of yeast that is used. They make this malt and in that process they change the starch of the grain into sugar, and in the fermentation the yeast plant uses that sugar for food and forms from

it the alcohol and carbondeoxide of gas which forms the foam on the beer. The yeast also produces other products which influence the flavor of that product. It is possible for a brewer to make beer that will be absolutely unsaleable because it has a defective flavor, because of the quality of the yeast which has been used in the fermentation, but all our fermentation industries have to pay attention to these things, to the raw materials which they use, and to the organisms which are employed in making that product. What we mean by a fermentation industry, is one which does employ some of these micro organisms, as we call them, in their processes. For instance; the brewer uses the yeast plant in making his product, the distiller does the same thing, the bread maker must use yeast in making bread, and so on in other fermentation industries we use different kinds of micro organisms.

If anyone should ask you this morning "what is the greatest fermentation industry of this state" I persume you would all say the brewing industry is the greatest one because Wisconsin has a large number of breweries. It is not a state where there are large distilleries, but I am certain if you gave that answer you would be wrong, for the greatest fermentation industry in Wisconsin is not the brewing industry but it is dairy manufacturies, the making of butter and cheese is just as much a fermentation industry, as is the making of beer. That is the whole basis of the manufacture of butter and cheese, is the activity of certain classes of micro organisms, not of yeast in the dairy manufactories but of certain classes of bacteria, that is, we must have them. The cheesemaker must have them in the milk if he is going to make cheese that will ripen, and so I think I am justified in claiming that cheese making is as much a fermentation industry, as is the manufacture of beer, and so the cheesemaker must pay attention not only to the quality of the milk but to the kind of bacteria that the milk contains. We have to pay attention to the composition of the milk, we have to pay attention to its fat content, we have to pay attention to the composition of that milk, we have to pay attention to whether it is tainted by the use of improper feed or by keeping the milk in improper places so it absorbs odors, etc., and then we have to pay attention to something else that everybody that is interested in the fermentation industry has to pay atten-

tion to, and that is the class of micro organisms it contains. We have in cheesemaking, classes of micro organisms which we must have, if we are going to make cheese, and we have another class which are decidedly harmful.

Many of you tasted the two pieces of cheese, the high scoring cheese and the one that scored the lowest. What was the difference between the two cheese? Some, I am afraid, could not tell the differnce. Experienced cheesemakers say that one of the great difficulties is that many do not know a good cheese when they see it. I thought that was not wrong when I heard a man say yesterday that he would rather have the low scoring cheese than the best one. A man whose judgment is no better than that needs some education along cheese making lines. The difference in those cheese was due to the classes of bacteria that entered. In the high scoring cheese the bad bacteria had been kept out and in the low scoring cheese they had gotten in and injured the quality.

The best milk is milk as nearly as possible in the same condition as when drawn from the udder of a healthy cow. I am very sure that is true. That is, we want milk free from bacteria of all kinds as it is possible to obtain it, and then we can put in the kinds of bacteria we want to better advantage than we can let the patron put them in for us.

The whole or a large part of the question of making good cheese comes back to the exclusion of these harmful types of bacteria. Your creamery man does not have nearly as difficlut a problem in the making of butter as you do in making cheese, simply because his raw products are such that he can exclude from them the harmful types of bacteria which may get in. In handling the milk, you are forced to use the product which is much more likely to contain these harmful types of bacteria, so every day we have to pay especial attention to that.

In the past, you know, we said it was the duty of the patrons to use precautions for keeping the milk clean, keeping it cooled down so it would not come to us over ripe or in bad condition. It seems to me that the patron has not done his share exactly, and yet it seems to me, that the cheesemaker can well ask himself "Is there no something I can do myself to obtain a high quality of milk which is brought to

me by my patrons?'' and it is upon that very phase of the subject I want to speak to you this morning.

It comes back to the same question which has been agitated in the past, that is the question of whey disposal and its effect on the quality of the milk which is brought to you by your patrons. The inspectors, who go around the state more than I do, know that changes have taken place in whey disposal in the last fifteen or twenty years, that from the large tank under ground, (which could not be cleaned out, could not be kept in a sanitary condition) we have outside tanks which are so arranged that they can be kept clean in case the cheesemaker will go to the necessary trouble. You know when the whey goes from the cheese vat to the whey tank it is warm, it is at the very best temperature for the growth of bacteria. You had to have it at that temperature in your cheese vat because in making cheese you have to have acidity produced, that means you have to have bacterial growth going on rapidly so when the whey goes to whey tank it is at temperatures favorable for the growth of bacteria. We have a factory getting 10,000 lbs. of milk a day; the whey is turned into the whey tank while it is warm. We make most of our cheese during the warm time of the year. The bacteria continues to grow rapidly and when that whey goes back into the patrons' cans the next morning it is decidedly sour because we have kept it under these favorable conditions. Another reason why it gets sour so quickly is because as it comes from the cheese vat it contains large numbers of acid forming bacteria and this, together with high temperature, assist development of acidity in that whey. If we keep that cheese tank clean we can keep down the odors which are likely to be objectionable, that is if we spend enough time cleaning it each day we are not going to have a condition that is going to get us into trouble when the inspectors come around there looking for unsanitary conditions around the factory. But that whey, no matter how well you keep your tank, whey will be sour when it comes to the farmer. If the patron does not wash his cans, and he probably never will wash them so as to get them perfectly clean, you are going to get more or less of the bacteria from the whey tank into the milk supply. Just as long as you do not have objectionable types of bacteria in the whey you are

not going to get into any great amount of trouble except with over ripe milk, that is the milk as it is produced on the farms during the summer time. Its bacteria content is pretty low, but it is likely to be kept quite warm and the number of acid forming bacteria we get into that milk from the whey tank, through the poorly washed can, is enough to start the acid forming bacteria we get in the milk from the whey tank growing rapidly and you are apt to cook over ripe milk too long. You know over ripe milk cannot be handled as easily as the milk that is in the best condition for cheese making. Sooner or later you are bound to get into that whey tank types of bacteria which are going to injure the flavor of the cheese. There are gas forming bacteria, there are many that do not form gas but they will serve to differentiate them from the helpful types of bacteria. When that happens then we contaminate our milk with the kinds of bacteria that are distinctly harmful to us. Those are going to continue to exist for a longer or shorter period of time; they are going to injure to a greater or less extent the flavor of our product.

This certain contamination of milk cannot be remedied entirely by keeping the whey tank in a perfectly sanitary condition. That whey is bound to be sour when it gets to the farm. We are bound to get more or less contamination handling the whey as most of our factories do at the present time. The only way to prevent trouble is by scalding that whey hot enough to kill all the types of bacteria it contains. This process, that is termed the heating of whey, is something about which I am sure you have read in the dairy papers, for instance in the New York Produce Review it was one of the views which was expressed in the cheesemakers discussion corner, and three or four Wisconsin men in answering that question spoke of this thing of which I am speaking this morning, that is the advantage from the cheeesemakers' point of view of heating whey, or scalding it if you want to call it that, that is heat whey to 150 or 155 degrees as it passes from the cheese vat into the whey tank. What happens? If we have any considerable amount of whey that temperature of 150 to 155 degrees is maintained for a long period of time. That temperature along for even a few minutes is sufficient to kill practically all types of bacteria in that whey

It cools down very rapidly in case the thank is protected at all, so by the time it is returned in the farmers' cans next morning it will have a temperature of 110 to 120 degrees F., still above the temperature at which bacteria will grow. If we heat the whey that way, we return the whey perfectly sweet and almost perfectly free from living bacteria.

What are the advantages in the treatment of whey in this way? Advantage both from the standpoint of the cheesemaker and the farmer? We know there is absolutely no question but what the sweet whey is better food for calves and hogs than is whey with a high degree of acidity, and the ordinary whey when it is returned to the farm even when it is pumped out of the whey tank, will have an acidity of 8-10 or 9-10 per cent. If we can send that whey back with very little acidity it will be better food for the farmers' animals. Another advantage for this treatment of whey from the farmers' standpoint is that it prevents the spread of disease. Dr. Ravenel spoke to you yesterday about the sources of tuberculosis and possibly he told you that one way to spread the disease from herd to herd was through the medium of our creameries and our cheese factories, but if we treat whey in this way it will destroy those disease producing germs which spread the disease from one herd to another.

It is going to save the cheesemaker a large amount of trouble in taking care of the whey tank. If you are going to keep it in a sanitary condition you have to put in considerable time cleaning the whey tank. If you heat the whey in the tank to a temperature of 150 or 155 degrees, you need spend less time keeping it clean because you are steaming it out anyway each day. There is not going to be very much fermentation take place each day and there will be no offensive odors coming from that whey tank. You can spend less time cleaning that tank when you heat the whey than you otherwise would have to do. Another thing that is of advantage from the standpoint of the farmer is that when you heat whey to these temperatures you prevent the fat forming on that whey. You know the fat comes to the surface of the whey and forms a slimey layer which is hard to remove from the cans and from the sides of the tank. The farmer who draws his whey first gets very little fat in it while the man who gets the upper layers gets the fat, and that

influences the feeding value of the whey to a considerable extent. This one-tenth of one per cent of fat in whey has a good deal of influence in determining its feeding value. When we heat the whey at these temperatures of which I have spoken we prevent the souring of our milk cans and we give to each patron whey of practically the same condition.

Now from the standpoint of the cheesemaker it is of the greatest importance, the scalding of whey, because it improves the general quality of the milk. I do not mean to say that by this process you are going to revolutionize the quality of the milk. You are beginning to have a small amount of effect in improving the general quality of milk used for cheese making in the state, and that is a very great thing. We have almost two thousand cheese factories in this state and if we can do a little to improve the general quality of the cheese it means a great deal of benefit financially to the cheese industry. For instance, you take the question of gassy cheese. I presume every factory in the state gets one or more days of gassy cheese through the season. If we can prevent one day's make of gassy cheese in each factory in the state, you can see what that means from the standpoint of returns.

This process of heating whey has been introduced very largely in Canada in the Canadian factories, especially in Ontario. It started some three or four years ago in one or two factories, which introduced it because they believed they could thereby improve the quality of their milk, and they found by experience that they could improve the quality of the milk, and so it has spread until it is used at the present time by a considerable number of factories in Ontario.

As I say, the reason that its introduction has been there, is through the influence upon the quality of the milk, and yet it has all the other effects of which I have spoken, the influence upon the feeding value, the prevention of the spreading of disease, etc.

The methods of heating whey are very simple as they are used in the Canadian factories. After the whey has been passed into the whey tank they heat it by the direct injection of steam, heat it to 150 or 155 degrees. It simply means the letting of a steam pipe into that whey tank and with various sorts of con-

trivances. For intance, many simply fit a cross arm on the bottom of the tank with an elbow on each tank, so when the steam is admitted it is given a rotary motion with a more even distribution than would otherwise be the case. With the equipment we have in our factories, an expenditure of $5 to $15 would put in the necessary apparatus for heating the whey.

Of course the question always comes back as to how much does it cost to heat the whey in this way. The Canadians have estimated that with coal at $4 a ton it would cost anywhere from fifty to seventy-five cents to treat the whey which represents a ton of cheese. You would not have to improve the quality of cheese to any extent in order to pay for the necessary fuel for heating the whey. It is not a question which involves a large amount of expenditure on the part of the cheesemaker, or a large amount of work. It would probably save work, when you take into account the cleaning done in a whey tank, to heat the whey than not to heat it.

So it seems to me this question of treatment of whey is one to which Wisconsin cheesemakers can devote much attention. I do not know how many cheese factories in this state are heating the whey but I am told by the inspectors that possibly not many. It is a very small trouble and it has these very great advantages, not only from the standpoint of the cheesemaker in improving the quality of the milk brought to him but also from the standpoint of the patrons it should be welcome and so it seems that it is one of the ways which the cheesemaker can use to improve the quality of the milk. As I told you in the beginning we have in the past kept talking to the patrons about improving the quality of their milk, told them they must do those various things, without asking ourselves whether there was not something that we could do, and here is one thing surely that the cheesemaker can carry out and it will have a very great effect upon the general quality of the cheese made in this state.

DISCUSSION.

The Chairman: I think Professor Hastings has made some good points on this and I presume you want to ask him some questions.

Mr. Parkin, Minn.: I would like to ask Prof. Hastings if he would not prefer the elevated tank to the underground?

Prof. Hastings: The elevated tank is undoubtedly the best because it can be so arranged that it may be emptied as easily as possible. It makes no difference how the tank is arranged, the elevated tank is more desirable in every way.

Mr. Reed: Would the use of a steam jet alone be sufficient to raise the temperature?

Prof. Hastings: No I do not think so. It is also necessary to inject steam in order to get the temperature up to 155.

The Chairman: I just wish to say that before I came here I was in Ontario for about four weeks, and was rather surprised to learn that practically all the cheese factories were heating their whey. Right in the neighborhood where I was born and raised and at the factory where I learned the trade, I do not think we had a bigger curse around the place than the whey tank and being assistant scrub boy for three years I realized it. I noticed in passing the factory they had a large elevated tank, and was told they were heating with a steam jet and did not have to have extra steam in order to get the desired temperature, and some of the farmers told me they were raising their calves on whey which they could not do two or three years ago.

Mr. Aderhold: I think this is one of the most important questions that has come up here. The early part of last summer there was a shortage of pigs but there was an awful lot of whey and a great many factories allowed the whey to overflow on the ground every day, and this caused a stench, which I believe caused a lot of trouble with the cheese because there was lots of trouble with cheese last year. The cheesemakers ought to take some action to compel the farmers to take their whey away from the factory. That whey either belongs to the farmer or it does not belong to them. If it does not belong to them, then buy an acre or two of land, get a lot of pigs and feed the whey yourself. If it does belong to the farmer, and I think he would

tell you so mighty quick if he wanted it, make him take all of it. Do not let him leave it on your premises to smell.

Mr. Parkin: We use a jet pump in our factory and it heats the whey to 120 degrees, and with but a little live steam the temperature goes up to 150.

The Chairman: In relation to what Mr. Aderhold said, I do not believe there are many factories where they have trouble in the farmers not taking too much whey. I think if the whey was in good condition they would be glad to take it home every day.

Mr. Aderhold: That is often the case but it was not the case last year. If they have pigs enough they will take it in any condition, but they did not have enough pigs last year. I know one cheesemaker that kept urging his patrons to take it and some of them would not do it. It was accumulating in the tank so he hired it hauled away and he told those patrons that if they did not take their share and he had to hire their share of whey hauled away again he would take the expense of hauling off their next check, and he told me there was no further trouble.

Mr. Parkin: The reason I asked the question of Prof. Hastings regarding the elevated tank, we find that the underground tank takes double and three times the steam to heat the whey as does the elevated tank, and for that reason I would not advise heating the whey in it. It is very expensive and very unclean to have an underground tank.

The Chairman: Is there anything else on this subject? This really finishes our program for the morning. Quite a number have expressed a wish to get away early this afternoon and the question in my mind is whether we will have enough for an audience this afternoon, so I thought it would be a good thing if we could work in the afternoon program this morning, even if we had to extend the meeting until after the dinner hour because it is not very encouraging to open a meeting with a few members. Mr. Osterhouse is to give the address which was to be given by Professor Humphrey. We have on the program this afternoon Professor Hastings and Mr. Parkin, of Minnesota. If it is the wish of this convention that we try and take up this program this forenoon we will endeavor to do so. If it is the wish of the members that we continue into the afternoon we will do so.

Mr Aderhold: I am afraid there will be only a small crowd here this afternoon. One of the speakers is from Minnesota and we would all like to hear from him.

Mr. Reed: I move that we take up the afternoon's program before we adjourn.

Motion seconded and carried.

The Chairman: We will now hear from Mr. Parkin, of Minnesota. Mr. Parkin is by no means a stranger to you. He has been here often before.

"QUALIFICATIONS OF AN UP TO-DATE CHEESE-MAKER."

A. W. PARKIN, Pine Island, Minn., Dairy Expert, Dairy and Food Department, State of Minnesota.

Mr. President, Ladies and Gentlemen: The subject assigned to me by your worthy Secretary is "Qualifications of an Up-to-Date Cheesemaker." This is a broad subject, and when I set myself to prepare a paper to read at this convention, before the most up-to-date, progressive and intelligent class of men connected with dairying, marketing and cheesemaking in America, Gentlemen, you can rest assured the thought came to me that I had bitten off more than I could chew.

I expect to be criticized for endeavoring to bring out a few of the essential qualifications a man should possess in order to be up-to-date and abreast of the times in the art of cheesemaking.

First, last and all the time a cheesemaker should possess good common sense and be blessed with tact, and to know how, when and where to use it. He needs to be phsically and mentally strong, to possess a common school education; at least be able to read and write plainly and know how to figure accurately in decimals and fractions.

A cheesemaker abreast with the times will be neat and clean about his person, and have all apparatus used in connection with his work absolutely clean and sanitary. By keeping his

personal appearance, and his cheese factory in a first class manner, he will be in position to command and demand the respect of his patrons.

He should take and read a goodly number of dairy papers, thus enabling him to be well posted on all matters pertaining to dairying. He can thereby give intelligent information to his patrons in regard to caring for milk, feeding, breeding, etc.

In order to be well qualified, a man must attend some good dairy school one or more terms, attend conventions pertaining to his particular line of work, send cheese to conventions and to the monthly scoring contests now being conducted in our leading dairy states. He should be a good judge of milk and cheese; he should be able to keep his brain working with and ahead of his hands; he should be ever ready to lend a helping hand to his brother cheesemakers, for the uplifting of his chosen profession, and always hungry and eager for information. An up-to-date man is not the man who knows it all, but is at all times a student. He must be ambitious, honest, industrious and a man of good habits. He should possess tact and back bone, so to speak, at the weigh can; be able to hold his patrons, and get new ones, and he should be able to make a good starter. He should know how to handle different working milks, how to make a good, marketable uniform cheese, and should keep posted in the different cheese markets. Our best cheese factory managers are looking for the up-to-date maker and are ready to pay a good salary.

An up-to-date cheesemaker is not the man that has a "hurry-up" process in making cheese. He is the man that gives every part of the process sufficient time to make the best possible cheese. He rises early in the morning with a pleasant "good-morning" for everybody. He has the self will and determination at all times to do better work today than yesterday. He will keep tab on his patrons as to the condition of their cans and the quality of their milk, and knows the yield of cheese he is making each day. He knows what his losses are in the whey. I do not consider any cheesemaker worthy of the name of being up-to-date when he ignores quality in his product for the almighty yield.

Gentlemen, above all, do not sacrifice quality for yield. Get quality and the reputation you will gain, as well as the higher

price you will receive for the product is worth far more to you and the cheese industry. The man who is well qualified in the art of making cheese, is the man that gets quality first, last and at all time.

DISCUSSION.

The Chairman: Are there any questions? If you would like to get some information from Minnesota we have Mr. Parkin to answer your questions. You want to remember, however, that this information originated from Wisconsin, because Mr. Parkin was born in this state. I always thought it strange that they had a good cheesemaker in Minnesota but now I understand it. Have you any questions you would like to ask Mr. Parkin? We have plenty of time.

Mr. F. Marty: I would like to ask Mr. Parkin in regard to some of the ways and means employed in Minnesota for the distribution of whey. That subject was up a while ago. Perhaps Mr. Parkin can give us some ideas.

Mr. Parkin: We have a compulsory law compelling the heating of whey. I also condemn all the underground whey tanks. We have nothing but elevated tanks and all the factories use the steam jet pump and the whey is heated to 120 degrees by this steam pump, and with a very little additional steam it is brought to the proper temperature. Some have the skim milk weigher to divide the whey but the larger proportion of them take it as they please.

Mr. Hart: What temperature does the law provide for?

Mr. Parkin: The law says 180 degrees but we know that is too high, we know that 160 degrees is as high as we dare go without causing a separation of the albumen.

Mr. Cannon: Who pays the extra expense of heating the whey, the cheesemaker or the patrons?

Mr. Parkin: The patrons of the factory pay for it.

Mr. F. Marty: Is there any Swiss cheese manufactured in Minnesota?

Mr. Parkin: We have only two factories, Mr. Marty, and so that does not amount to very much.

Mr. Aderhold: Is that heating of whey law generally lived up to?

Mr. Parkin: Pretty much so, yes sir. I try to see that it is.

M. Buchen: Mr. Parkin spoke about a man being an up-to-date cheesemaker, that he must be able to hold his patrons and gain new ones. How would you recommend getting new patrons for a factory?

Mr. Parkin: It is a matter of tact and a cheesemaker's ability to get along with his patrons.

Mr. Buchen: My experience is that there is a man in every neighborhood who will wait until everybody else pays out and then he will pay a cent or two more than the other fellow, and he is the up-to-date cheesemaker.

The Chairman: I do not think he stays up-to-date long for he goes broke before his date is up. A good cheesemaker usually gets all there is coming to him and usually pays all there is coming to the other fellow, and the man that does not do that does not stay long in the business. It is miserable competition, and pretty hard competition, to have to meet, but he is going to get somebody some day to make up for the premiums he has paid. We have questions like that even in the wholesale cheese business.

If there are no further questions to be discussed on Mr. Parkin's paper, we will impose on good nature again by calling on Professor Hastings. Mr. Osterhouse will be ready to speak right after Professor Hastings.

THE IMPORTANCE OF PROPER METHODS OF PROPAGATION OF STARTERS FOR CHEESEMAKING

PROF. E. G. HASTINGS, Madison, Wis.

Mr. Chairman, adies and Gentlemen: Things are coming a little quicker than I anticipated. The other subject about which I wish to speak for a few minutes is something along the line that I spoke previously. I have tried to impress upon you that the cheesemaking industry is truly a fermentation industry, that we have to have those certain types of bacteria in order to make cheese; we must have them in the milk and if the milk comes to us without sufficient numbers of them we have to put them in and we put them in from the starters. A starter is used, you know, when the milk comes to you too sweet, it is under ripe, and so we add the starter to hasten the process of ripening. Before the days of starter making, the process of making was simply prolonged, they had to wait for the acidity to develop, but with the aid of a starter we can hurry things along during the making process, so there is one place where we use the starter in modern cheese making.

I told you a few minutes ago that the best milk for cheese making was milk as nearly as possible in the same condition as when drawn frm the cows. That means that it contains very few acid forming bacteria. The acidity would not develop for hours if you put that milk into your cheese vats, but if you could get hold of that milk and use a starter, you are much more certain to get a uniform product than you are with milk which already contains a considerable number of acid forming bacteria when it reaches you.

The other place in which you use a starter in cheese making is when the quality of milk is poor, when you get gassy milk, for instance. In the cheese there is a certain amount of work to be done by the bacteria, just as there is in every other place in the fermentation industry. For intance, in the making of bread we have to have a certain amount of gas formed in order to get that bread to be light enough. In the making of cheese we have to have a certain amount of acid produced. You must study

your best to have all the sugar in that cheese fermented by bacteria; it makes all the difference in the world what kind of bacteria ferment that sugar, it makes all the difference in the world between the helpful and harmful types of organisms. The cheesemakers say that the addition of a starter inhibits the growth of gas forming bacteria. I doubt whether that is true or not. That is the usual explanation, but possibly this explanation will be as satisfactory to you. We have milk with no gas forming bacteria in it; the sugar is going to be fermented by the types of bacteria that make good cheese. We have in one sample, for instance, nothing but gas forming basteria; we have a cheese that is absolutely worthless, and when we get milk containing one half of the harmful type and one half of the helpful type of bacteria, we have a medicore cheese, to say the least. Where the starter comes in is that we add to that milk the right kind of organisms. Possibly I might use an illustration to make that point clear. I have used this illustration with the dairy students, we have a pen of hogs here, one half are black and one half white. We put in one bushel of corn, the black hogs will get as much of the corn as the white, but if we can change the ratio between the black and white and diminish the black ones, the white will get the most corn. When you have so much work to be done and when the harmful types are present, they will do the most work and injure the quality of the cheese. If you can increase the desirable types in any way, without necessarily diminishing, even if you do not diminish the harmful types, you improve the quality of the cheese. That seems to me the whole explanation for the use of starter in the handling of poor milk.

The thing that I want to impress upon you and emphasize just a moment, too, is the necessity of proper starter making for the cheesemaker. This has been emphasized very much from the standpoint of the buttermaker. The buttermakers know the advaitage of starters in their work and yet in the cheesemaking industry it is just as important. The buttermakers realize the importance of making a proper starter by a proper method, but I do not think it is so often realized by the cheesemaker. If we are going to add the starter to milk, the cheesemaker ought to be certain that he is adding the right kind, the kind that is going to improve the quality of his cheese and not injure it,

and yet we know very frequently that the cheesemaker gets hold of starters, uses them, which do injure the quality of the cheese rather than improve it, simply because he has not followed the proper methods of starter making. Our buttermakers have not only brought to them the proper method of propagation, but they use better types of apparatus than aer found in most of our cheese factories, that is, the starter cans I think are used more largely in the creameries than in the cheese factories. I do not mean to say that the starter can is essential for the making of a good starter, for it is not. We can make as good a starter with an improvised apparatus as we can with the more elaborate apparatus we can purchase, but the starter can does give the same results with less expenditure of labor and time on the part of the operator than where he works without it. For intsance, in the creamery we can heat that starter or cool it down and keep it at the right temperatures while it is developing much easier than where we have improvised apparatus, and that is the great advantage of modern apparatus.

In starter making we use what we call our home made starters and what we call our pure culture or commercial starter, and it seems to me that any man at the present time should use the pure culture starter, rather than the home-made starter. Now I know as well as you that a home-made starter is often just as good as the best commercial starter you can buy, but now and then you are likely to get into trouble with a home-made starter, more likely than you are with a pure culture starter, and I believe it is money well expended by either a buttermaker or cheesemaker, to buy commercial starter of reputable manufacturers rather than attempt to make home-made starters. The trouble comes in cheesemaking, and often in buttermaking as well, that our starter makers seek to take a short cut, they seek to get the same results with less expenditure of labor, and that often leads them into trouble. There is absolutely no short cut in starter making. If you are going to do it and going to try to get a good starter each day, you must do it right and when you seek to economize on time and labor in one way or another it will lead you into trouble. You might as well learn by our mistakes as by the mistakes of others. Last summer in making cheese at the dairy school, the boys got to

economizing a little in reference to making starter, and what happened? We practically lost several days' make of cheese because of the use of poor starter. They saved some time but we lost enough cheese, or injured the quality, in three or four days to pay for the extra time that would have been expended for making cheese starter of the right kind throughout the year.

I have had cheeesmakers talk to me this past summer with reference to methods of starter propagation, which I knew would sooner or later get them into trouble. A man may go through a whole season with certain methods but ultimately he is bound to get into trouble and will get poor cheese because of the starter he makes.

I do not want to take your time this morning in telling you of the proper methods of starter propagation or making starter for cheesemaking, because you can get that information to much better advantage in other ways. For instance, a bulletin has been issued by the college which gives very much in detail the proper methods of starter propagation.

I think that the cheeesmaker should be provided with just as good types of apparatus for making starter as is the buttermaker, and that can be improvised by him. If you are going to make starters for cheesemaking you should be able to control them, not only with reference to the types of bacteria in them but with reference to over ripening. An over ripened starter, the starter in which the acidity gets too high, is a good deal worse, from the cheesemaker's point of view, than an over-ripened starter from the buttermaker's point of view, because with an over-ripened starter the cheesemaker gets the curd too hard. The sour milk contains a large number of bacteria, the lactic acid bacteria which we want to go through the milk in the cheese vat, and we cannot do it if it is so full of lumps that the bacteria are enclosed in the curd. When we over ripen our starter we injure the flavor, we diminish the good the bacteria may do in our cheese. In order to keep a starter in good condition, for instance we buy from the manufacturer a bottle which contains only one kind of bacteria and it is the kind the manufacturer knows is all right for your purpose. As we carry that along from day to day we learn there are other kinds of bacteria which

might get in and injure it very greatly, so one of the great things in the question of starter propagation is to keep the undesirable types of bacteria out, and when we use the short cuts we are very liable to get them in. The other thing which is of great importance is to have some way of controlling the ripening of that starter, and that is especially true in cheesemaking, so the starter will not be over ripe when it becomes necesary to use it.

I do not want to take your time in going into these methods because you can get them to better advantage in other places, but it seems to me the reason I want to speak of this a few minutes is that this question is deserving very much more attention than the cheesemakers of the state have paid to it in the past. For instance, how many of you know we have a course for practical butter and cheesemakers next month? We have had one for two or three years. A great many cheesemakers who come to that course say they have never used starters; know nothing concerning the methods of handling or proper propagation, and I believe that the correct handling of starters will do as much for the cheesemakers, as it has done for the buttermakers, but unless you are willing to put in the time necessary to make them in the proper manner they are likely to be harmful rather than beneficial. I thank you.

DISCUSSION.

The Chairman: We still have a little time. Are there any questions you want to ask Professor Hastings?

Mr. F. Marty: I would like to ask Professor Hastings whether he does not think that the lactic fermentation is more necessary in cheesemaking than in buttermaking?

Prof. Hastings: It certainly is because butter can be made from perfectly sweet cream but cheese cannot be made from milk which does not contain lactic acid bacteria. The lactic acid bacteria are as essential in cheese making as the yeast which the brewer uses in making beer, and we never hear of a man trying to make beer without yeast.

Mr. Parkin: What per cent of acidity should the starter contain when the lactic acid bacteria are most active?

Prof. Hastings: Six tenths to seven tenths per cent. Not much above that.

Mr. Parkin: What per cent does the starter have when over-ripe?

Prof. Hastings: That would depend to some extent on the acidity of the milk, but it is generally over ripe when it begins to curdle. You want a starter that has the greatest number of living organisms. If you get up to 8/10ths or 9/10ths per cent that starter is over-ripe and it is very likely to whey off. We cannot get it mixed with our milk so well as if the acidity was not so high. I do not mean to say that we cannot get a starter with 9/10ths per cent in as good physical condition as a starter with less degree of acidity, but we are more likely to get into trouble so we want to keep the acidity down.

Member: What kind of culture do you prefer for starters?

Prof. Hastings: All the starters on the market, so far as I know, will give good results. I do not think ayn starter maker will claim his starter will always do the same thing, but all the commercial starters will give you good results. A man who is in the business, if he is going to be successful, has to pay attention to certain points, he has to keep his starter so as to give the buttermaker and the cheesemaker results. These men are all doing it. These starters may go off one way or the other, it is something the maker cannot prevent because in the starter there are living things, there are those bacteria and they are hard to handle. We cannot make a race horse trot a mile in the same time every day because his condition is different each day, and so it is with anything where we have life to contend with. We do not want to condemn a starter because it does not always give you good results, because none of them will. I do not think any of the makers will claim it, as far as I know, but I know any starter on the market at the present time will give you good results.

Mr. F. Marty: In the manufacture of Swiss cheese, while we are taking on a starter, to some extent we claim that we must have a certain amount of lactic acid also in sweet curd cheese, but we do not know how much lactic acid our home made rennet should contain. We do not know that we can tell as we should the amount of lactic acid in the home made rennet because there

may be variation in the ripeness of the milk, and I would like to ask Professor Hastings whether the experiment station has carried any experiments along that line, which I think would be much needed for the Swiss cheese industry of this country?

Prof. Hastings: Nothing has ever been done along that line, and so far as I know very little has been done along that line in Switzerland. The question of Swiss cheesemaking is different from Chedder cheesemaking, that is in the home made rennet the acidity can be made higher and get good results than it can with the skim milk strater. One reason is because in one we do not have the curd to contend with. There is pretty good reason to believe that in Swiss cheese making we have to have other kind of bacteria than we have to have in Cheddar cheese making. The whole question is one of fermentation. The reason we can get from the same milk, by the handling, the different Swiss cheese, Cheddar cheese, brick cheese, etc., all comes back to the different types of bacteria, and I believe in the home made rennet we have, besides the ordinary live organisms, another kind of acid forming organism so they can use there a starter with higher acidity than in a Cheddar cheese factory. In Switzerland there is an experiment station which corresponds to our U. S. Department of Agriculture and they have done an immense amount of work on Swiss cheese, and they claim the forming of eyes or holes in Swiss cheese is due to certain types of bacteria which do not form in the sugar. The eyes in Swiss cheese develop very much larger and they are supposed to be due to the fermentation of lactic acid by another kind of bacteria which makes some gas, and that develops the hole in the Swiss cheese. You can get a Swiss cheese that will be a typical Swiss cheese but have no eyes. We have what we call short cheese. Instead of the cheese stretching and getting hole it will get a crack. You cannot make bread out of pie crust, can you, because your pie crust is too short. That is one thing the Swiss cheesemaker has to pay attention to, the development of eye in the Swiss cheese, which is a very important thing believed to be due to the fermentation process.

Member: May I ask a question about American cheese? I have been troubled for the last thirteen years with cheese mellowing down after milling and before salting, it becomes corkey.

The Chairman: Mr. Aderhold can you answer that question?

Mr. Aderhold: The ripening process is influenced by the amount of moisture in it, the amount of acid in it, and the temperature to some extent largely by those three factors. If your curd gets very cold, if it is too dry, not enough moisture, or if the acid is not working, it is not going to mellow down as it ought to do. Those three factors will largely influence the mellowing process.

Member: In my thirteen years' experience I have called on practical cheesmakers to tell me about this. I have always been bothered by the cheese not mellowing down. I have tried all experiments at all seasons of the year.

The Chairman: Is there anybody else that would offer a short suggestion.

Mr. Aderhold: Mr. Marty has been getting some good pointers from Prof. Hastings. I would suggest if he would spend an hour with him he could learn a good deal about Swiss cheese making.

Mr. Parkin: I would like to ask Professor Hastings if he has tried making a starter out of pure culture and with what results?

Prof. Hastings: No I never have, but I cannot see why that should not be done in cheesemaking. It is not as good for butter making because we can never get as many bacteria in a whey starter as in a skim milk starter.

The Chairman: I am going to cut this discussion right off now as we are trying to get two sessions' work in one and we have other papers to bring up. I would like to have everybody ask questions but we cannot do it if we are going to take the afternoon's program and include it in the morning session.

We have still on the program an address by Professor G. C. Humphrey, of Madison. As Professor Humphrey is unable to attend because of illness he has kindly sent a substitute in Mr. A. C. Osterhouse, who will now address you.

ADDRESS

MR. A. C. OSTERHOUSE, Madison, Wis., University of Wisconsin.

Mr. President, Members of the Wisconsin Cheesemakers' Association: I am here only as a substitute for Prof. Humphrey and I will surely try to cut my address short, and the few questions which you may perhaps ask I will do my best in answering. The subject which your president or your committee gave Mr. Humphrey was to talk on whatever he felt like. Prof. Humphrey has been ill for the last few days. A substitute is a poor proposition and certainly will be in this case with me.

What I expected to speak to you on was the relation which the cheesemaker should have to the building-up of the herd, perhaps, in other words, the relation which the cheesemaker has to the farmer himself. I understand that part of the program has already touched on those points, but there are four general headings which I want to speak of, in which the cheesemaker can help in building up the herd.

First, in the interest the cheesemaker should have in the farmer and in the herd, the general interest which he shows every morning when the farmer comes to his factory, deep interest in what the animals are producing, questioning him regarding the different indivduals, and in a general way know what the farmer is doing, what he is feeding and what he is producing. I understand that has been pretty well touched on. Regarding the general interest he should have in the herd. One point which perhaps has been touched on is the testing of the herd, trying to get the farmer to test his herd and see what that herd in itself is producing. This is indeed an important point. If the number of cheesemakers we have in this state and the numbers we can have, aim to do the work they can, there will be an improvement in the number of cows and the production of the individual cows. In order to improve we have to know what we have. In that way the farmer must improve on the start; he must know what each animal is doing; he must weigh every pound of milk he takes from that animal. This has been touched on to a certain extent, but this other point has not been touched on, that is the relation the

cheesemaker should have in establishing of test associations. We have testing associations starting over the entire state and the cheesemakers should be interested in this work. To start these testing associations we need a man that is somewhat above the general run. The cheesemaker is perhaps the first one we would think of, a man that comes in touch with the farmer, perhaps has had somewhat better training on dairy subjects and is placed in closer touch with them. He should then be interested in the establishment of these testing associations.

THE EXPENSE OF ESTABLISHING THESE TEST ASSOCIATIONS.

The only thing necessary is to have one person who is able to help the farmer in organizing, and the farmers will continue. Perhaps the best way to establish a test association is to take from perhaps twenty to twenty-five farmers in a circuit. Use for that one circuit that one supervisor, and in that way you have one supervisor that oversees the production and the general feeding of the animals. If you have from twenty to twenty-five herds in the circuit the tester is able to come to each herd once a month and spend a day at each farm. During that time he can test the milk from perhaps at least two milkings, and in that way this tester helps the farmer in keeping his records, encouraging him to weigh his milk and test that milk, talks to the farmer in regard to the production of his individual cows, etc. There is a great deal that can be done by that tester and the character of the man you get and the test he takes each week always determines to a great extent the success of that association or that circuit. For instance, if we had twenty farmers enter into a circuit, we could perhaps have from four hundred to five hundred cows. The cost would then be perhaps $1 a head to know what your animal is producing during the entire year. Then you have the advantage of this supervisor going to the other farms examining records, going from one farm to another, and the cheesemaker is indirectly benefited thereby. About $400 to $500 then would easily be obtained simply for the testing of these herds for their milk production.

The supervisor of this testing should be a man who has

passed the examination for testing of tuberculosis, that is, one month of the year could be used for conducting the tuberculin test of the herd. It would perhaps have to be conducted every two years. In this way a farmer has his herd tuberculin tested and his herd tested for dairy production for a very small amount.

Another thing is the breeders' associations which are starting thoughout the entire country. This is of general interest perhaps to the animal husbandry but it touches very closely on the work of the cheesemaker, the one development will be depending necessarily very closely upon the other. Wherever you will find testing associations starting, you will soon find breeding associations. Sometimes we have the breeders' association before we have the development of the test associations. This idea was first started in 1906. We found twelve farmers in Waukesha county developed what they called the Waukesha Co. Guernsey Breeders' Association. They have already established Waukesha county as somewhat a center for Guernsey cattle. Since that time there have been thirty-four other breeders' associations established. In these breeders' associations we have simply a few men who unite regarding the breeding of those animals, those men who are in the same line of breeding. We have Holstein Breeders' Associations, Guernsey Breeders' Associations, Jersey Breeders' Associations, the Ayershire Breesders' Associations. Of those small breeders' associations we have the most Holstein associations although we have many Guernsey associations and Jersey associations. It makes no difference what association you belong to or what association the cheesemakers establish, they are interested in it. Then we have something different, it concentrates the work of the farmer and he gets from it something in a general line.

One of the first ways by which the farmer is benefited by the breeders' association is that he can buy stock direct. That is, if you have a breeders' association the general requirement would be to keep pure bred sires. We have development from one source. Again, when a farmer in a breeders' association wants to obtain stock all he has to do is to have the association, as a whole, buy stock from another commun-

ity which has developed along that line. He can buy in large quantities. For instance, if we want to buy an individual Holstein, or individual Jersey in some territory, we would have to go a long distance, look around and buy on our own responsibility, while in an association several can get together in buying and several get together in selling. Buying is important, perhaps not as important, as selling in the breeders' association. Wherever we have a breeders' association we take it for granted we have a center for that breed. In some localities we have breeders' associations already established where we cannot speak of them as centers, although in a general way we have a center for a breed wherever we have those associations formed. Over at Lake Mills we have a center for Holstein cattle simply because the farmers organized over there to handle the Holstein breed. If we have a buyer from Japan, from Mexico or from the Pacific Coast at the college, a buyer wanting a carload of cattle, we have practically one center to send them to. We are developing other centers, developing a great center in Sheboygan county for the Holstein breed, perhaps it is not as large yet as Lake Mills. Lake Mills is the center and that is the one point to which we have to send a man when he comes to buy a carload.

There are few things that these breeders' associations cannot do. They cannot compel a man to join if he does not want to. That is one of the things, perhaps, we can never do is to try to compel. We do not compel any particular district to go to work and form a breeders' association, but men that want to improve their stock want to get into other lines, these associations can help them along and in that way help them develop their herds. The association cannot furnish a sire free of charge but a member can get the use of a sire at a reduced price. That is, in the circuit we have a sire that can be used for several herds, and in some of our localities we have a herd that stands out in prominence, we have a man that has to buy an especially high grade sire and use it on his own herd; while in one way it is a good idea in that it does not spread disease, still he feels when he pays a high price for that animal that the animal must be used on many animals in order to reproduce most for the farmer.

Again the breeders' association cannot develop a breed in a short time. That is, it takes the same length of time to develop type in a certain length of time to develop similiarity in a breed. That is one of the things, however, which cannot be done without organization. As in the Guernsey and Jersey breeds, take for instance on their home islands, the Guernsey and Jersey Islands, their characteristics are carried on by one line of breeding. There is no importation into the islands and in that way they have established a breed. Now in these localities of Wisconsin with simply good general systems of breeding and following one line, we will soon have that same popularity which those small islands have. Much then can be done by establishing breeders' associations.

Another system which the cheesemaker can use to a certain extent perhaps is the system of placarding his cheese factory, or have a blackboard above his weigh can suggesting to the farmers certain things. The cheesemaker might be better informed regarding the feeding of the animals, then he might have a blackboard showing some system of breeding or have a blackboard showing some system of feeding. Have just a few placards to show which grain rations, giving a general rule for feeding cows grain, suggesting roughage, suggesting corn silage, suggesting some of these thins is all the farmer needs, when he commences to think of them he will develop them himself. He will simply see the blackboard and he will begin to think what is meant by feeding a ration. Give him an idea of how much he should feed according to the production of his animals. If he has had ideas on production he has some method on which he can base his system. The system we have at the university is one we can use on a small blackboard, is to feed as many pounds of grain per day as the cow produces butter fat per week. A very simple system, and a system which, while he may not follow it to the letter, will still set him thinking along this line.

The agricultural college is more than anxious to do anything for you, giving blackboards, giving suggestions along that line, and are more than anxious for you to ask for a man to assist you in starting breeders' associations and test associations. We will send a man to a farmers' meeting to talk on testing as-

sociations or we will send a man there to do the complete organizing.

A cheesemaker can do much in a general way in aiding a farmer to know what he is doing in the dairy industry. The first thing he must do is to get rid of the scrub sire. I simply want to call your attention to the relative intensity of the blood line and the influence of relatives in individuals, that is to show the effect of individuals, to show the effect of ancestors on each succeeding generation. First, to show in how short a period the breeder can improve his stock; we find there have 2,046 animals gone into the breeding of one animal. What I want to do is to place the emphasis on the first number, that is simply showing a sire will have great influence on the first generation and the second generation, but the animals that are the most closely related have the great influence. When we come to the tenth generation we expect to find but a small per cent of influence. Some men in speaking of their changes, speak of the blood they have in an animal ten or twelve generations back. Get the farmer to know the advantage of one individual sire and what that sire will do for him immediately, not what it will do in generations to come. The first generation is where we receive the most benefit. Here is another way showing the improvement of the blood by the continuous use of pure gred sires. The dam started with a scrub animal, in the second generation we have 50% improvement, in the third 75%. In the sixth generation, and six generations of breeding is a short time, we have 96.87% of pure blood in the individual, although we started six generations back with an impure animal. I just want to call your attention to how quickly we can influence the blood, how quickly we can get rid of the common blood in the individual. If we can get every farmer to have the production which we have in our pure bred animals, to take good care of those animals we would have place for many more cheesemakers in our industry.

I want to call your attention again to the willingness of the agricultural college to help in the establishing of breeders' associations, in the establishing of testing associations, in any of this work they are more than willing to help you. The cheese

maker perhaps helps his community better in that line than in any other.

I thank you very much for your attention although I do not feel I have given you just what I should have given for a cheesemaker's meeting.

The Chairman I think Mr. Osterhouse has made a very good substitute, although I am not familiar or acquainted with Professor Humphrey. I am sure he has brought out some good points and also emphasized the fact that the agricultural college offers many advantages for the people of Wisconsin in many different lines of work.

On account of lack of time we will have to move along. I think the last number on our program is the report of committees. We have only one committee to report, that is the committee on resolutions. We will now have that report.

REPORT OF RESOLUTION COMMITTEE

A. T. BRUHN, SPRING GREEN, WIS.
Chairman

WHEREAS, This Nineteenth Annual Convention of the Wisconsin Cheese Makers' Association through the good efforts of its officers and of other persons, and because of the exceptionally excellent program which has been prepared by our Secretary, Mr. Baer, has been a success in the attainment of our purpose,

Therefore, Resolved, That our thanks are hereby tendered collectively to all of those whose efforts have contributed to this success.

Resolved, That the thanks of this association is due the Citizens of Milwaukee who through the Citizens' Business League and their honorable mayor have contributed materially to the success and entertainment of this convention.

Resolved, That the thanks of this association are due and are hereby tendered the supply men and the transportation

men for their moral and substantial support in the past and present.

Resolved, That our thanks are hereby tendered to the attending students from the Wisconsin Dairy School, under the able leadership of Mr. F. P. Swingel, for the songs and yells which created much enthusiasm during the sessions.

Resolved, That we tender our thanks to the management of the Republican House.

Respectfully submitted,

A. T. BRUHN, Chairman, Spring Green, Wis.
P. H. CASPER, Welcome, Wis.
E. G. SWINGEL, Avoca, Wis.

On motion duly seconded and carried, the resolutions were adopted as read.

The Chairman:

We have managed, perhaps by crowding the work a little, to finish our afternoon's program this forenoon, and the reason for this has already been given to you. The average number of members are ready to go home this noon and I am satisfied we would not have sufficient audience here this afternoon for any man to get up and address. I trust that each of you have enjoyed your visit to Milwaukee and obtained some good information from this convention, and I sincerely hope we will see you all here another year and others with you. Each individual member can undertake to increase the membership. It may seem a small matter to be an officer of the cheesemakers' association, but I can assure you it is not. The hardest work I have done for the past five years has been done the past three days, probably due to the fact that I have not been well, but we trust that each member will help the officers increase the membership as much as possible. We do want to enlarge our membership. There is no reason why Wisconsin, with over 1,800 cheese factories, should have only about four hundred members in an association of this kind that meets only once a year.

There being nothing further, we will declare this meeting adjourned *sine die*.