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Second annual report of the Wisconsin Buttermakers' Association : held at Waukesha, Wisconsin, February 24th, 25th and 26th, 1903. 1903

Wisconsin Buttermakers' Association
Madison: Cantwell Press, 1903

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SECOND ANNUAL REPORT

OF THE

Wisconsin Buttermakers' Association

Held at Waukesha, Wisconsin, February 24th, 25th
and 26th, 1903

Organized February 21, 1901

COMPILED BY
E. H. FARRINGTON



MADISON
CANTWELL PRESS
1903

LIST OF OFFICERS

F. B. FULMER, <i>President,</i>	- - - - -	ETTRICK
JAMES VAN DUSER, <i>Vice-President,</i>	- - - - -	HEBRON
E. H. FARRINGTON, <i>Secretary,</i>	- - - - -	MADISON

EXECUTIVE COMMITTEE

R. C. GREEN,	- - - - -	ALBION
C. J. DODGE,	- - - - -	WINDSOR
G. B. WINSOR,	- - - - -	MAUSTON

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MADISON

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NAMES OF MEMBERS OF THE WISCONSIN BUTTER-
MAKERS ASSOCIATION, 1903-1904.

Abbott, W. A.....	Portage
Adams, M. J.....	Milwaukee
Alexander, C. B.....	Chicago
Allen, Geo. W.....	Waupaca
Amend, J. E.....	Ripon
Anderson, A. E.....	Oelwein, Iowa
Anderson, F.....	Sylvania
Andrus, H. B. J.....	Niellsville
Austin, W. A.....	Kewaunee
Bast, H.....	Garnet
Bast, Jos.....	Stockridge
Bates, Russell.....	Madison
Bates, R. R.....	Madison
Baumgartner, A. J.....	Fennimore
Bell, K. J.....	Chicago
Benson, L.....	Fort Atkinson
Benson, S. L.....	Fennimore
Berkholtz, H.....	Middleton
Benkendorf, G. H.....	Madison
Bjearegaard, R. P.....	Green Bay
Black, C. O.....	Deerfield
Blumenstein, Frank.....	Sullivan
Boettcher, John E.....	Guthrie
Boss, Frank.....	Edgerton
Boss, F. W.....	Leyden
Bowar, Frank.....	Cazenovia
Bowman, H. S.....	Sauk City
Brown, F. M.....	Cedar Rapids
Brunner, J. A.....	Durand
Buchanan, Wm.....	Whitewater
Burchard, H. C.....	Fort Atkinson
Burritt, D. R.....	Burlington
Busch, B. G.....	Lamar

Bush, Chas.....	Blue Mounds
Bussard, R. M.....	Poynette
Button, C. E.....	Mt. Hope
Cafilisch, W. H.....	Baraboo
Cornish, O. B.....	Fort Atkinson
Carswell, Allan.....	Range
Carver, C. A.....	Milwaukee
Casey, W.....	Elgin, Ill.
Chapin, B. J.....	Woodlawn
Chapin, C. J.....	Omro
Christenson, Caius H.....	De Forest
Christensen, C.....	Racine
Coats, F. S.....	Chicago
Cole, Anton.....	Magnolia
Collyer, W. D.....	Chicago
Cook, John J.....	Burlington
Cornelinson, T.....	Cooksville
Covill, A. L.....	Nelsonville
Coyne, D. J.....	Chicago
Crippen, Geo.....	Portage
Dabareiner, J. F.....	Jefferson
Dale, J. L.....	Allen's Grove
Dalley, B. H.....	Milwaukee
Dasch, E. O.....	Ironton
Dixon, W. C.....	Madison
Dodge, C. J.....	Windsor
Drews, F. G.....	Lowell
Driscoll, J. L.....	Dodgeville
Duxbury, E. L.....	Green Bay
Eastman, E. L.....	Saukville
Eberts, W C.....	Chicago
Elder, Geo. A.....	Chicago
Emery, J. Q.....	Madison
Erickson, Albert.....	Volga
Esker, O.....	Madison
Fairchild, Arthur.....	Chicago
Falk, J. W.....	Greenwood
Farrington, E. H.....	Madison
Feind, W. J.....	Helenville
Field, Frank.....	Elroy

LIST OF MEMBERS.

7

Ford, J. A	Prairie du Sac
Friday, H. B.	Markesan
Fulmer, F. B.	Ettrick
Gallagher, T. S.	Chicago
Gehrke, Fred J.	Manawa
Gerlach, C. G.	Grafton
Gibbons, Thos. H.	Elgin, Ill.
Gibson, David I.	Nelson
Gibson, J. O.	Beloit
Gierasch, W. S.	Madison
Gilbert, H. E.	Alma Center
Glaessel, L. H.	Fort Atkinson
Godfrey, Harvey.	Whitewater
Godfrey, I. H.	Lima
Godfrey, J. H.	Madison
Goetch, H. A.	Winthrop, Minn.
Golden, C. H.	Rome
Golz, Edwin.	Princeton
Goodchild, L. A.	East De Pere
Grashoin, C.	Mayville
Greene, F. D.	Walworth
Greene, R. C.	Albion
Greenwood, E. A.	Deerfield
Griffin, H. E.	Hancock
Grow, A. V.	Whitewater
Guelzow, Aug.	Oakfield
Gullickson, Martin.	Cushing
Hamann, A. C.	Edgar
Haugland, A. C.	Chicago
Hanson, Edw.	Deer Park
Hardison, Warren F.	Alma Center
Harris, B. T.	Warren
Hayes, H. J.	Chicago
Hayward, B. H.	Royalton
Helgerson, L. P.	Elkhorn
Hendrick, F. C.	Manawa
Hendrickson, H.	Morrisonville
Hermanson, Erick.	Northland
High, Arnold.	Berlin
Hildemann, E. J.	Belle Plain
Hoiberg, H. B.	Floyd
Holland, O. E.	West De Pere

Holm, J. C.....	Rockdale
Holmes, A. J.....	Wilton
Holmes, G. H.....	Baraboo
Hovey, E. L.....	Capron, Ill.
Huebner, E. A.....	Shiocton
Huth, F. W.....	Troy
Hyne, W. J.....	Evansville
Jaquith, F.....	Dartford
Jennings, A. A.....	Chicago
Jordan, G. E.....	Amherst
Kaemmer, Chas.....	Almena
Kaetner, Joseph.....	Elmhurst
Kates, C. M.....	Custer
Kates, C. W.....	Custer
Kechel, J. C.....	Whitewater
Kelling, F. H.....	Jefferson
Kepple, V. S.....	Holmen
Klookker, J. A.....	Markesan
Knaack, E. W.....	Rusk
Knaack, Gust. J.....	Princeton
Knoll, Paul.....	Johnson Creek
Koch, E. E.....	McFarland
Koch, E. L.....	New Lisbon
Kreutzer, Geo. A.....	Athens
Kuhl, F. W.....	Adams
La Bundy, B. A.....	Elkhorn
Laurene, P. L.....	Gibson
Lee, Frank.....	Evansville
Lee, L. C.....	Hanover
Lester, W. H.....	Albion
Lewis, J. W.....	Evansville
Lonsbury, J. M.....	Watertown
Lunsted, Oscar D.....	Pigeon Falls
Mau, Wm. A.....	Elk Mound
Meinhardt, F. A.....	Chicago
Meyers, M. H.....	Madison
Michels, M. J.....	Calumet Harbor
Michner, E. P.....	Chicago
Miller, G. H.....	Jefferson
Mitchell, E. C.....	Dodgeville
Moldenhauer, A. J.....	Theresa

Monrad, J. H.....	New York City
Montgomery, A. R.....	Capron, Ill.
Moore, J. G.....	Albion
Moore, W. S.....	Chicago
McAdam, Wm.....	Vernon
McCormick, E. C.....	Buena Vista
McCormick, F. E.....	Almond
McIntyre, G. G.....	Whitewater
McKerlie, J. G.....	Waukesha
McLane, A.....	Whitewater
Nelson, P. D.....	Plover
Nerhaugen, J. S.....	St. Paul, Minn.
Nisbet, Hugh.....	Bloom City
Nosovitch, I. H.....	Madison
Olson, Matt.....	Medford
Orvald, Ole M.....	Stoughton
Osgood, H. B.....	Chicago
Paddock, E. A.....	Elkhorn
Parmen, A. L.....	Mazomanie
Pasche, Chas.....	Medford
Perry, C. L.....	Berlin
Peterson, G. E.....	New Holstein
Pfeffer, Miss Kate.....	Pewaukee
Pheatt, H. D.....	Milwaukee
Pingel, E. C.....	Elkhart
Pinkert, Frank.....	Medford
Quirk, J. P.....	Burlington
Radcliff, W. H.....	Bancroft
Radke, Henry A.....	Houlton
Riley, J. T.....	Milwaukee
Rohn, Frank.....	Arcadia
Safford, Orton.....	Van Dyne
Salter, R. W.....	Hayton
Sass, Chas.....	Rubicon
Schipling, S. B.....	Mason City, Ia.
Schinke, C. F.....	Bowers
Schinner, Jos.....	Wales
Shumway, C. P.....	Milwaukee
Simonson, J. A.....	St. Paul, Minn.

Snow, C. G.....	Madison
Sprecher, J. U.....	Black Hawk
Stewart, G. M.....	Mazomanie
Stewart, Hiram.....	Vernon
Stewart, W. A.....	Eagle
Stratton, J. R.....	Meriden
Strebe, A. F.....	Brothertown
Stryker, J. W.....	Lomira
Sudendorf, E.....	Elgin, Ill.
Sweeting, C. W.....	Madison
Thompson, A. E.....	Poplar Grove, Ill.
Tingleff, C. P.....	South Wayne
Tomblingson, R. E.....	Moran
Townsend, Homer.....	Poynette
Traeger, Gust.....	Mazomanie
Ullmer, J. S.....	Green Bay
Van Dresser, M. L.....	Bloomer
Van Duser, James.....	Hebron
Verthein, Wm.....	Madison
Vincent, Walter H.....	Mindora
Voigt, W. A.....	Naugart
Wach, Chas.....	Oconto Falls
Wahler, L. O.....	York
Ward, C. J.....	Fort Atkinson
Warner, T. J.....	Meehan
Weaver, A. E.....	Darien
Weber, G. H.....	Beaver Dam
Weber, J. C.....	Fond du Lac
Weber, J. F.....	Toland
White, F. F.....	Waterloo, Iowa
White, J. H. & Co.....	Chicago
Whitney, G. C.....	Poisippi
Williams, C. H.....	New York, N. Y.
Winsor, G. B.....	Mauston
Wollenzien, L.....	Milwaukee
Wuethrich, Fred.....	Theresa
Wunsch, John.....	Viola

ARTICLES OF ORGANIZATION AND BY-LAWS

OF THE

Wisconsin Buttermakers' Association.

ARTICLES OF ORGANIZATION.

ARTICLE FIRST. The undersigned have associated, and do hereby associate themselves together for the purpose of forming a corporation under chapter 86 of the Revised Statutes of the State of Wisconsin, for the year 1898, and the acts amendatory thereof and supplementary thereto, the business, purposes and objects of which corporation shall be the education of its members for a better practical knowledge of creamery operation, promoting progress in the art of butter making, in the care and management of creameries the sale, transportation and storage of butter, and in the weeding out of incompetency in the business of butter making; the further object of the incorporation is to demand a thorough revision and rigid enforcement of such laws as will protect the manufacture and sale of pure dairy products against fraudulent imitations, and to suggest and encourage the enactment of such laws in the future as experience may from time to time demonstrate to be necessary for the public good of the dairy industry.

ARTICLE SECOND. The name of said corporation shall be the "Wisconsin Butter Makers' Association," and its principal office and location at Madison, Wisconsin.

ARTICLE THIRD. The association shall be a corporation without capital stock. Any person who is a practical creamery

operator, and such other persons as are connected or interested in the manufacture and sale of pure butter may become members of this corporation by paying one dollar (\$1.00) annually in advance and signing the roll of membership.

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

ARTICLE FIFTH. 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 all necessary committees and sign all orders drawn on the treasurer, and perform such other duties as may pertain to his office.

The vice president shall discharge the duties of the president in the event of the absence or disability, for any cause whatever, of the latter.

The principal duties of the secretary of said association shall be to keep a complete and accurate record of all meetings of the association or of the Board of Directors, keep a correct account of all 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 safely and systematically keep all books, papers, records and documents belonging to the association, or in any wise pertaining

to the business thereof. He shall keep a complete list of the membership, help formulate and publish the program for the annual convention, publish a full report of said convention after adjournment, assist in such other matters of business as may pertain to the convention, and such other duties as properly belong to his office.

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

The board of directors shall be the executive committee and shall audit all accounts of the association or its officers, and present a report of the same at the annual meeting. The executive committee shall assist in the necessary preparations for the annual convention and shall have sole charge of all irregularities or questions of dispute that may come up during any annual meeting. They shall determine the compensation that may be connected with any of the various offices.

The board of directors with the other officers of the association shall constitute the executive board, which board shall decide upon the date and place of holding the annual convention, premiums to be offered at said convention, and such other regulations as may be necessary for the success of the annual meeting.

ARTICLE SIXTH. The treasurer of the corporation shall give a bond in the sum of two thousand dollars (\$2,000.00) for the faithful performance of his duties. The said bond to be approved by the board of directors before being accepted by the

secretary. Whenever the corporation may so desire, the office of secretary and of treasurer may be held by one and the same person. This action can only be taken at a regular election of officers.

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

ARTICLE EIGHTH. The first meeting of this corporation for the election of officers and directors shall be held on the 26th day of February, 1903, and such corporation shall hold a meeting of its members annually during each calendar year at such time and place as may be determined by the executive board.

BY LAWS

ARTICLE FIRST. All elections shall be by ballot, except in the case of a single nominee, when election by acclamation may be substituted.

ARTICLE SECOND. This Association will accept no special or side premiums of any nature whatsoever.

ARTICLE THIRD. Only one tub of butter may be entered from any one creamery for competition for any of the prizes or premiums; if more than one tub is so entered such entries shall be debarred from participation in all premiums.

The size of butter packages entered in competition at the Association contests shall be no smaller than a twenty pound tub.

The butter so entered shall belong to the Association. After the scoring contest has been completed the said butter is to be sold; the Association will pay the express charges, the exhib-

itor's membership dues for the current year and such other expenses as may be connected with the butter exhibit; the balance remaining from the sale of the butter shall be deposited in the treasury and be devoted to the premium fund for the next annual convention.

ARTICLE FOURTH. The privileges of the Association butter contests are open to exhibitors outside of Wisconsin, but such exhibitor must be present in person, or have a representative of the creamery present at the convention to entitle him to share in the pro rata premium fund or compete for any other prizes offered by the Association, and must conform to all regulations required of state exhibitors.

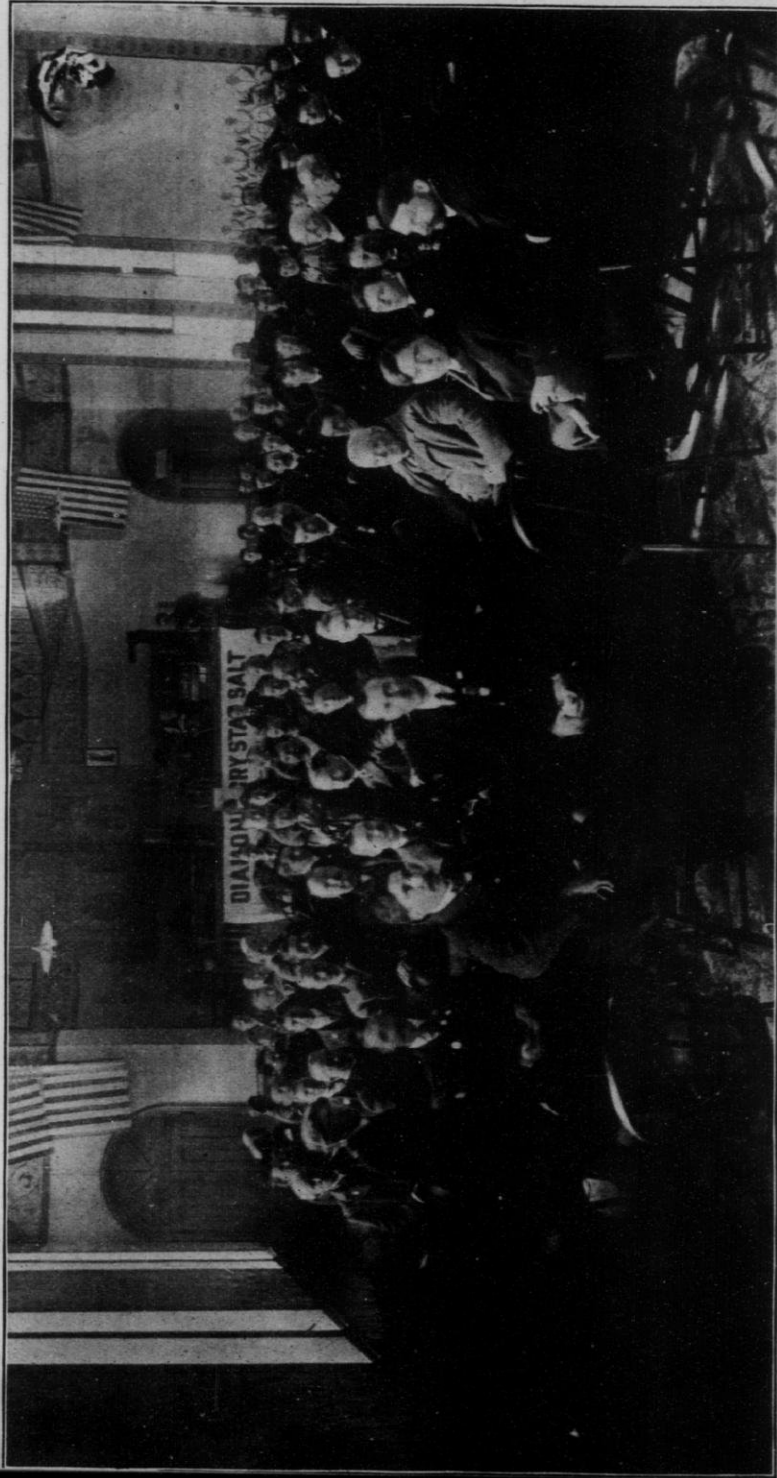
ARTICLE FIFTH. The Association shall give a Gold Medal for the highest scoring tub of butter and a Silver Medal for the second highest.

ARTICLE SIXTH, SEC. 1. The score that shall entitle an exhibitor to a share in the pro rata shall be determined by the executive committee in advance of each yearly meeting.

SEC. 2. The scores of those exhibitors not participating in the pro rata shall not be published.

ARTICLE SEVENTH. All points of parliamentary practice not covered by the Articles of Incorporation or these By Laws, shall be governed by "Robert's Rules of Order."

ARTICLE EIGHTH. These By Laws may be altered or amended in the same manner as prescribed in the Articles of Incorporation.



ANNUAL MEETING AT WAUKESHA, FEBRUARY 24-26, 1903.

SECOND ANNUAL MEETING
OF THE
Wisconsin Buttermakers' Association.

Meeting called to order at two o'clock P. M., February 24, 1903, by President Fulmer.

President Fulmer: Gentlemen, the time has come when we should formerly open this our second annual convention. We are pleased to see so many present, we hope that many more will arrive to attend the later sessions. This convention will be opened with a prayer by the Rev. C. H. Williamson.

Invocation by Rev. C. H. Williamson.

ADDRESS OF WELCOME BY MR. D. J. HEMLOCK.

Mr. President, Members of the Wisconsin Buttermakers' Association, Ladies and Gentlemen:

I regret that his Honor, the Mayor of this city, is unable on account of serious illness to welcome you. He is a man of broad views, a man active in business pursuits and experienced in the affairs of life and familiar with the business with which you are connected. He thoroughly understands the different grades of cows, and his presence here, and his experience in said matters would be invaluable to you in addressing this meeting.

The address made before you a year ago, gentlemen, was made by a scholar at the city of Madison. He then said that he was not acquainted with the dairy business. You have before you

a person at the present time who has had some experience in the dairy business. I remember quite well, having, while on the farm, a three-legged stool at first; afterwards a one-legged one, running after the cow to get a chance to milk her as she was running around the yard, at a speed that would baffle the fleetest, but finally succeeding in milking her to the great detriment of the milk. I remember also that when the milk was skimmed, and the cream was gotten together to churn, and the cream was made ready, part of my duties consisted in churning in the old fashioned way unknown to modern science, churning with one hand and passing the cream to my mouth with the other. Then there was serious consideration among the members of my family, whether it would not be better for all that I should engage in some different occupation, and seeking what advice they could, concluded, after an exhaustive conference, to send me away from the farm to school, to the great advantage of the cause of good dairying and their own financial interests.

Now, ladies and gentlemen, seriously, you are engaged in one of those callings that commends itself to the large proportion of the people of the state of Wisconsin. You reach the rich, you reach the poor, you reach every class of people, you reach the homes of the wealthy, you reach the humble cottage of the poor. And when I went down stairs a little while ago, when I saw those contrivances for the manufacture and care of butter, I thought that I had got into the wrong place. I never saw anything like them before. Yet the progress of the buttermakers in the state of Wisconsin is ever onward and upward. In no other state of the Union has such progress been made than in the state of Wisconsin. Wisconsin has become, not only in her industries, in her buttermaking and cheese making, the peer of any other state in this United States, in producing those commodities that will compare favorably with the products of any country in the civilized world.

Allow me to congratulate you for being engaged in this noble avocation. You reflect credit, not only on yourselves, but will

reflect credit on the generations that are to come and especially so if your deliberations here are governed by that wisdom and prudence so characteristic of the citizens of this state.

You will find, gentlemen, in this city, men of the highest character and standing, men engaged in all avocations of life, of the professional and commercial pursuits. Men capable of taking a stand in any of the vocations of life. You will find here pure water and you will find pure upright women. You will find pleasant associations and happy homes.

Gentlemen, come to this city and enjoy yourselves, make it your home while here. I am authorized by the Mayor of the city of Waukesha to turn over to you the freedom of the city, while you sojourn here. I bid you welcome, thrice welcome, the city of Waukesha is yours while you remain.

RESPONSE BY H. B. J. ANDRUS.

Mr. President, Brother Buttermakers, Ladies and Gentlemen: You must bear in mind that I respond from the butter-maker's standpoint. I am not an orator. We appreciate the earnest way with which we are received. It pleases us, it makes us feel good. We have been but a few hours in Waukesha—we like it. During our stay we will undoubtedly continue to like it. It is a nice town, it makes us feel good to come to this city.

Now, Wisconsin is several hundred miles long, and some of us live further away than others from the place of meeting of this association and to come to a town like this, is a real pleasure. We thank the city for its most hearty welcome. While we regret that we cannot meet the Honorable Mayor of this city, yet we have been welcomed most heartily. We thank the people that have been so energetic in getting this convention for this city, doing everything in their power in order to make it substantial. A prominent citizen of this country once said to

young men, "Promise little, and do more." Waukesha has promised a whole lot and done more than that. It has been noised about that the United States is a great country—the greatest on the globe. One of the lordly lords across the water admits it; Mr. Carnegie proclaims it, and figures show it. Wisconsin is a part of that; dairying is another part—a part of that great whole which we represent, although there are but a few of us here today, something that is no small matter in the state of Wisconsin.

See the acres of land cultivated, the dollars invested, and the people employed in the dairy business. Think what it means! We have the largest number of cheese and butter factories of any state in the Union. Our annual output was \$55,000,000. Think of the wealth! Think of the capital that would pay dividends on! It is no small thing. Perhaps our association has members not enough to make a good showing; but I may say that our organization is young—this is our second meeting. Last year our president remarked that we had no history to refer to, which is quite true; we are making that—we have got a whole year ahead—and we are making that product (history). If the state of Wisconsin wakes up and recognizes us as Waukesha has done, our future is quite secure. There is no reason why we cannot exist and be of benefit to the state at large. Of course we are always looking out for ourselves and have a good time, as buttermakers have to stay at home. Lot of times our overalls get pretty dirty, and we have to be, often. It is a pleasure to come to our meetings and when we come to consider the dollars that we brought into the state, it stimulates us, it makes us think that we are really doing something. While our work is not all boys' play, lots of things isn't, and we can be well content with our work.

Our work is appreciated here, our Waukesha friends undoubtedly appreciate it. In Northern Wisconsin, in Clark county, my home, the dairy industry there is quite young; although it is becoming, I think, one of the best dairy counties in the state.

Natural resources are good, they are excellent. Nature has done its work towards our country. We do hope for developments which will surely come. During the last year, in round numbers, there were 40,000 acres of land sold—most of it in 80 and 160 acre tracts, only to actual settlers. There was only one big deal carried through, that was one township sold to outside parties. Just think of 40,000 acres sold to actual settlers! They are clearing it and will convert it into one of the most prosperous farming and dairy districts of Wisconsin. There is no reason in the world why Northern Wisconsin cannot produce an immense amount of dairy produce; our water is excellent; everything is in fine shape for development. Again let me thank Waukesha for its hearty welcome.

SECRETARY'S REPORT.

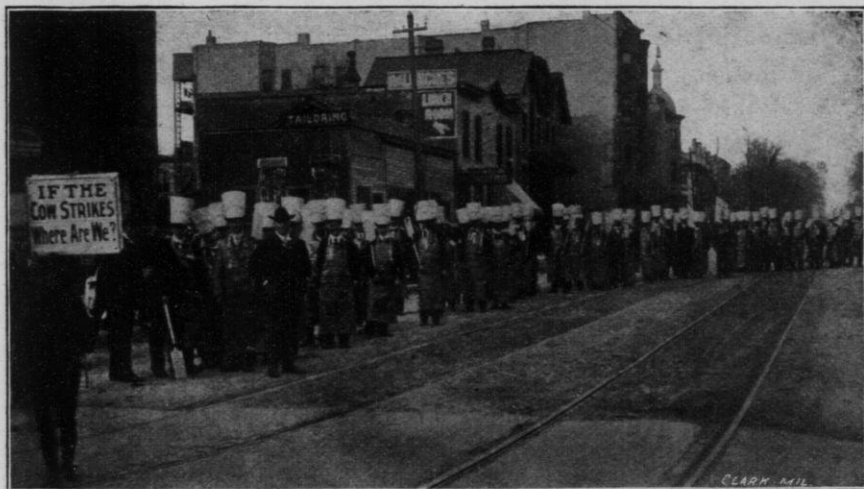
At a meeting of the executive committee just after the close of the last convention, it was decided to pay all bills and then print the proceedings of our first convention if there was money enough to pay the printer. This it was found possible to do and 500 copies were printed and mailed to members of the association and others interested in its proceedings. Some copies of that report are still left and may be had by members in good standing so long as the supply holds out. This report was printed in less than two months after the meeting, so that the members of the association had not entirely forgotten about it when the fresh, new report arrived at their factories.

A financial statement was printed in the report and it covered all transactions of the association up to that time.

Since then there have been two meetings of the officers of the association. One at the time of the State Fair at Milwaukee and the other late in December.

At the September meeting, during the State Fair week, it was decided to engage headquarters for the Association during the

time of the National Creamery Buttermakers' Association convention, which was to be held at Milwaukee in October. This was done and the secretary arranged for the decorations of the Wisconsin Buttermakers to be worn during the National convention parade. He bought 100 outfits consisting of a paper buttertub used as a hat, a buttermaker's oil cloth apron on which was printed "Wisconsin Buttermakers' Association," and a wooden butter spade. About 150 Wisconsin men were in line



WISCONSIN — THE WINNERS IN THE NATIONAL PARADE.

in the parade, and although many other state delegations made a fine appearance, it was the unanimous opinion of the three judges appointed for the purpose that Wisconsin deserved the \$50 prize which was offered for the best appearing company in the parade. This \$50, together with a small surplus from the sale of the decorations, was paid into the treasury of the association.

Among the transparencies carried by the Wisconsin men in the parade were the following:

"We are in the Wisconsin cow trust."

"Keep warm by eating Wisconsin Butter."

"We make \$11,921,914 worth of butter annually."

"If the cow goes on a strike where are we?"

"We are so-churners in the cream city."

"One cow set Chicago on fire, there are a million cows in Wisconsin."

The Wisconsin men at the National convention had a good time and went home well pleased. They were especially happy over the royal way in which the city of Milwaukee provided for the entertainment and accommodation of the visiting butter-makers from other states, and were also proud of the fact that a member of the Wisconsin Buttermakers' Association won the highest score of any butter exhibited at this the National convention of creamery buttermakers. The winner of this prize was Mr. E. L. Duxbury, of Green Bay, who is with us at this meeting and will read a paper to us before the convention closes.

Late in December a meeting of the executive committee was held at Madison and arrangements were made for the second annual meeting of our association. The president had received a number of invitations from various cities and towns in the state requesting the association to meet with them. These were all carefully considered and after repeated voting on the question it was at last unanimously decided to accept the Waukesha invitation.

At this same meeting it was decided to incorporate the Wisconsin Buttermakers' Association, and this was done December 27, 1902.

Before concluding this report the secretary wishes to express his sincere thanks for the valuable assistance he has had in making arrangements for this meeting. The Mayor of Waukesha and the local committee have given every aid and assistance possible to make the meeting a successful one, and I am sure that we all appreciated what they have done for us and feel under great obligations to them and the citizens of Waukesha, who have done all they could to make us feel at home.

At the last meeting of the officers of this Association it was decided to ask the state legislature for an annual appropriation of \$1,500 for the purpose of paying the expenses of our annual meetings, to publish our reports and to help us to promote the dairy industry of the state as well as to raise the general standard of Wisconsin's dairy products. The president informs me that a bill for this purpose has been introduced into the legislature, and every member of the Association should now use his influence to have this bill become a law during the present session.

E. H. FARRINGTON, *Secretary.*

TREASURER'S REPORT.

The financial condition of the Association at the close of our first annual convention is printed in the annual report which has been distributed to the members of the Association. This shows a balance on hand at that time of \$68.35

Received from National Association, first prize for Wisconsin delegation in parade 50.00
 Membership fees to date 135.00

(This does not include all members who have sent butter but will be counted later.)

Advertisements in programs to date 165.00
 Miscellaneous receipts 34.79

\$453.14

Paid Out.

Printing and mailing programs and other postage to date, including mailing reports \$122.47
 Miscellaneous expenses 5.91
 Traveling expenses of officers and executive committee 75.84
 Medals 22.00

\$226.22

Leaving a balance on hand 226.92

M. MICHELS, *Treasurer.*

The above statement of the financial account of the association has been examined and found correct by the executive committee.

G. B. WINSOR,
R. C. GREEN.

The President: The report of the treasurer is referred to the auditing committee.

PRESIDENT'S ADDRESS.

BY F. B. FULMER.

Another year has passed since we closed our successful convention at Madison. In greeting you at the opening of this, our second annual meeting, I will say that I trust that the past year has been an eventful and a successful one for you all. The creamery industry in general has had a prosperous year. Prices for butter have averaged higher than for some years past. New and successful creameries have been established and older ones have increased their output. This is due largely to increased production and not to enlarged territory. There seems to be a general, practical knowledge permeating the ranks of the actual producers as well as the manufacturer of milk products. In a few instances I have known of an advance in wages for the operators, but I do not think that this is as general as I wish it were.

The success of our organization has been quite satisfactory, but your officials feel, that considering the number of creameries in the state, the membership ought to be considerable larger than it is at present. It would be a good plan for the members present to call upon their neighboring buttermakers when they get home and urge upon them the desirability of joining at once, provided they are not already members.

Wisconsin was fortunate to have the last National Creamery Buttermakers' Convention within the state. Many of you were

in attendance at that notable gathering and received benefits therefrom. It was gratifying that a member of our state association should capture the gold medal in the convention butter contest, and who also stood second for the championship trophy. I trust that members of this association will continue to keep up and accelerate the state record that has been started. As you probably all know, this state delegation captured the first prize in the parade, which money was turned into the treasury of this association. However your officials have found that there has been a lack of keen interest and promptness of support from the supply trade, due to the National Convention having been held in this state; this cause will probably have an effect on the attendance at this meeting. The point of financial support will be taken up at one of the sessions and I trust be amply discussed and delt with in a satisfactory manner.

Appreciating the splendid success of and the benefits derived from the method of scoring butter, as inaugurated last year, your committee adopted the same method for this convention. Mr. W. D. Collyer, who so ably and satisfactorily acted as judge last year, has consented to serve in the same capacity for this convention. The exhibitors will have the exceptional privilege of direct, personal criticism of the butter, having the defects pointed out at the side of the tub. However, remember that the scoring of butter is a tedious job at best, it is trusted that none of the exhibitors will unnecessarily delay matters.

As you have probably learned by press reports, steps were taken to incorporate our association under the state laws. We have a certified and recorded copy of the Articles of Incorporation and also the certificate of the Secretary of State, which will be open for the inspection of the members. This matter and the adoption of new By-laws will be further discussed at the business meeting session later on. A bill has also been introduced in the State Legislature for an annual appropria-

tion for our association. It is trusted that each member will write his State Senator and Member of Assembly to work and vote for this bill, which is known as No. 72, S. A printed copy of said bill is herewith presented for the inspection of the meeting.

I do not know how the other officers of your association view the subject, but I can say for my part, that I feel there has been a lack of advice, criticism and suggestions from the membership. Candid criticism and advice are usually helpful to the officers of an association like this, and it is hoped that more of the members will express themselves on matters pertaining to the welfare of the organization in the future, than they have in the past. To compensate, in part, for this failure, we trust that you will manifest an increased interest in the papers read at our sessions and make the discussions following them as interesting as were the discussions at our last convention.

The success of our organization depends upon the judicious and timely business management and then upon the interest manifested at the convention. The officers are largely responsible for the arrangement of details for the convention and for looking after the interests of the association between the annual meetings. The success of the sessions of the convention rests more directly upon the members than the officers; without the co-operation of the members, the officers could not have much of a convention. Kindly see that this convention does not fail to receive your hearty support.

MUSIC.

The President: I am exceedingly happy and suppose you will be when we tell you the great surprise we have in store for you. We have one of the old land marks with us. I am sure we will all be delighted to hear from him. I have the honor of calling up Mr. Jules Lombard, who will favor us with a song.

Mr. Jules Lombard: It is a long way to come to sing a song. I have just arrived and if I respond I must sing something that does not need an accompaniment. The song is of a young man who goes to see his lassie when the old people are supposed to have gone to sleep at night, and he makes his presence known under the window of his sweetheart by singing the following song.

SONG.

Mr. Jules Lombard: Now while I have the floor I will act as president of this meeting for a few minutes as I have something to bring before this convention. On my way up from Chicago this morning I happened to meet the president of the National Good Roads Association, he represents the Louisiana Purchase Exposition at St. Louis that is to take place in a few months. Now I want him to come up now and invite you all to come to that exposition. Mr. Moore come forward.

ADDRESS BY MR. MOORE.

Gentlemen, I will say to you I would rather hear his angelic voice than to speak. I must say that his influence was so strong, was strong enough to induce me to come here and meet you gentlemen. I must say, however, that I never had the pleasure of hearing him sing. I have been in his company several times, I have been in his city; knew of him when he was in the railroad business. I have come here to urge him to be at that great meeting, I think we will arrange a double quartet, I suppose he will be one of them.

I do not think, geneltmen, that it is very much out of the way, as I told a gentleman the other day, to say that I am a farmer and he looked at me and says I am one too, but you don't look like me. Well I am a farmer and feel like one. I have lived on the farm until I was 16 years of age, I know what the farmer's life is. What we are trying to do is to reach the farmer and I

am glad to inform you that we haven't anything to sell, it does not cost you anything for our wares. If you can come to St. Louis to our next meeting, if we can induce you to be a part of it, of that great convention—because I may say, gentlemen, that I feel proud of it that I am its president—I will not forget that gentlemen—that to take part in it I came this morning to Wisconsin to invite Mayor Rose to be one of the great speakers at that convention. In this connection, gentlemen, I will say this to you, that on April 27, 28 and 29 of the present year we have the National and Inter-national Good Roads convention called at St. Louis. Right after that, April 30, May 1 and 2 is the dedication services of the Louisiana Purchase Exposition. That means three days for the roads and three days for the dedication services. I want to tell you that since the first of the month I have traveled a great deal, I have been up to Vermont, down to Massachusetts and so on around. We feel that this is a special privilege to meet the agriculturists of the west. We want you all to come there because you are connected with one of the greatest industries of the United States. In the first place we have got the Secretary of Agriculture there on the 27th—Mr. Chairman, I am glad to see the ladies coming here—ladies and gentlemen; I will say this to you because we want you to come to this convention, we have got the Secretary of Agriculture there on the 27th. We have got Senator Daniels, he will be there on the 28th. Col. Henry Watterson, of Kentucky, will be there on the 28th, and many others will speak on that day. Congressman Hepburn, of Iowa, and many others will speak on the 29th; then there is the Governor General of Canada, Lord and Lady Minto, they will be there on the 29th; and if congress will not be in special session you will see a great many of the senators there; you will see the Governors of all the states there, President Roosevelt and all of the diplomats and many other officials will be there on the 30th.

President Cleveland will make the opening speech and I know that a great many of you will be there to hear him and I know

that a great many of you will not be there to hear him. I know that Ex-Governor Hoard will be there or is he here, Mr. Chairman. General Corbin will have charge of the Army and will be the largest military display ever witnessed in the west in times of peace, two of the gun boats will be in the river to fire the salute upon the President's arrival. We are doing this, gentlemen, in order to bring you people there.

When you come there you will see the exposition buildings far advanced; you will see buildings there capable of seating 40,000 people—by the way, in coming here this morning with Mr. Lombard he told me that he was 73 years old and you hear such a voice as that, well, if that voice is there we will have it in an assembly room that seats 40,000 people.

Mr. Lombard: I haven't got the price.

Mr. Moore: I don't care whether you have got the price or not, you have got the voice, that will do just as well.

You have a bill I understand you want to get it through the legislature to appropriate a sum of money to enable you to make an exhibit at the exposition, if you can do that you can do more for your state than the National Association can do to bring your association into prominence. Don't merely write to your senators and representatives, select men to go there and work for your bill, buttonhole them so to say, every one of them and make them promise to support your bill that is the way to do it. Now we have just such a committee, that is Col. Pope, of Massachusetts, and Mr. ———, and they got me in there, we are taking the good roads problem into congress. Mr. Richardson, of Tennessee, asking for federal aid to good roads, appropriating \$20,000,000. Mr. Payne, the Postmaster General, told me that he was not enforcing the law in regard to free delivery that they were turning down the free delivery because you have not got a road 25 miles long that you can carry mail over the entire year. Yet you are the backbone of the United States. Agriculture is first, manufacture is second and commerce is third.

What is the cause of it, it is because the farms produce more money than all the railroads of the United States than the manufacturers.

You are giving, gentlemen, over sixty per cent. of the entire taxation to carry on our government which averages over \$700,000,000 every year, and, gentlemen of the farms, you are only getting ten per cent. of it back. Great custom houses are only built in the city and you on the farm, you are only to get ten per cent. of it back.

Now, gentlemen, in conclusion, I am glad that I have met you and I hope, Mr. Secretary, that you will have a successful meeting and that you will come to St. Louis to attend our meeting. I thank you, gentlemen.

Song by Jules Lombard.

THE USE OF GASOLINE ENGINES IN CREAMERIES.

BY E. E. KOCH.

Ladies and Gentlemen: As Prof. Farrington has asked me to write a paper on the use of gasoline engines in creameries, I will attempt to do so although I do not feel able to do it as it should be. I hardly think you will enjoy another paper written by me after hearing this one. But experience is the best teacher as our worthy secretary will find from this experience.

I bought a six-horse power Hart-Parr gasoline engine September, 1902, and have used it since for creamery power with a six-horse power boiler for heating purposes. But I think an eight-horse power engine would do my work more satisfactorily. The boiler is plenty big enough. I will say from what experience I have had with a gasoline engine, they are the power for creamery purposes. There are several reasons for saying so. They run with a more even mo-

tion than steam because as a general thing steam is up and down in a boiler, at least that has been my experience, and when the steam goes up or down in the boiler it affects the motion on the engine, and an uneven motion will cause a separator to get out of balance soon, and will not give as good results in separating as an even motion will.

Creameries can be run cheaper with gasoline engine and steam for heating purposes than they can with steam for power. For example, will give you figures for four months in 1901 with steam for power, and the same four months in 1902 with gasoline engine for power and steam for heating purposes. September, October, November and December, 1901, I used 37 tons of coal at \$3.83 per ton, \$141.71; received during the four months 382,105 pounds of milk. The cost of handling one thousand pounds was 37 cents. September, October, November and December, 1902, I used 304 gallons of gasoline at 11 1-10 cents per gallon, \$33.77; sixteen tons of coal at \$3.92 per ton \$62.72; total, \$96.49. Received during same months 508,391 pounds of milk. The cost of handling one thousand pounds was 18 9-10 cents, a difference of 19 1-10 cents per thousand, but will say the old boiler I was using used more fuel than a new boiler would, so do not think these figures will apply to boilers which are in good shape. I am satisfied there are creameries in Wisconsin which are using extra fuel enough, on account of inferior machinery, to pay interest on the money necessary to buy first-class machinery. I think there are other makes of gasoline engines probably just as good as The Hart-Parr, with one exception, it is an upright engine and does not rack a base like a horizontal engine will. You can readily see that the concussion on a piston moving up and down will not rack the base as much as the concussion on a piston moving horizontally. A few miles from our factory there is a skimming station run by 5½ horse power horizontal engine. The engine was placed on a base very much like the one our engine is

placed on, and their base is racked quite badly while the base our engine rests on is firm as ever. There is less work handling a gasoline engine, it uses less oil, and is very clean. I would say to those thinking of buying new power for their creameries I would get an eight-horse-power gasoline engine and a six horse power boiler for a creamery running from seven to twelve thousand pounds of milk per day. In all cases get an engine with power enough to handle the machinery easily, and you will have no trouble with the engine. In getting an engine with plenty of power the engine will last longer, use less gasoline and will not exhaust the battery so quickly as if you tax the engine heavily, which you will have to do if you get one with just power enough to do your work. There are so many sparks in a battery. The oftener the engine ignites the more sparks it uses, and when the engine does its work easily it does not ignite so often, thus the battery will last longer. All gasoline engines from six to ten or twelve horse power should use one gallon of gasoline every ten hours to run the engine, after that it should use one gallon of gasoline for every horse power used every ten hours. For example, a six horse power engine if worked to its full capacity for ten hours should use seven gallons of gasoline. All gasoline engines for creamery purposes should have the cylinder inclosed and so arranged that a six-inch stove pipe may be attached and piped out of the creamery to carry the burnt gas out of the building which passes through the cylinder. If an engine has but one ignitor attached to it it should be a tube ignitor, as it is surer than the spark ignitor. But I think both are necessary, if one should get out of order the other could be used without delay. The spark ignitor is far the handiest of the two. The engine can be started in a few seconds with the spark ignitor, while with the tube it takes some minutes. There is a smell of burnt gasoline from a tube which does not come from the spark ignitor. If you have a

gasoline engine and fire breaks out on the premises and you have plenty of hose you can get the water where you most need it without delay. There are three important things in handling a gasoline engine. First, plenty of gasoline in supply tank. Second, having both ignitors in running orders. Third, to avoid getting too much gasoline into the pan where gas explodes. This happens generally when the engine is hot when being started after it has been stopped recently. By getting too much gasoline in at once it will not explode and will have to evaporate or be worked out by turning the engine some time with the ignitor attached and no gasoline allowed to flow in. This need not happen if operators are careful not to open valve which admits gasoline to engine too much at first. An oil cooler is an improvement over the water cooler, as it does not need any attention winter or summer. Some manufacturers will tell you the oil coolers are not a success, that it will not cool the cylinder properly in warm weather, because they do not make them. But experience has proven that they are a success.

DISCUSSION.

The President: This is a very able paper which to most of us is somewhat important paper, to the buttermakers at least. It seems to me there ought to be some considerable discussion.

Mr. Michels: I would like to ask Mr. Koch if he entirely overcomes the smoke when he has piped out the engine exhaust as he states?

Mr. Koch: No sir, there is very little smoke unless the wind blows it through the door.

Question: I did not get the figures how much it costs you by the thousand pounds?

Mr. Koch: When I was using steam it cost me 37 cents, when I was using gasoline for power and steam for heating purposes it cost me 18 9-10 cents per 1,000 pounds.

Mr. Parker: How does he get the same even power with the gasoline engine as with the steam engine?

Mr. Koch: For the reason that the steam is apt to go up or down in the boiler, it is impossible for a man to attend to the boiler, to handle the milk and at the same time attend to the separator, and with the gasoline engine you have no variation of motion.

Mr. Parker: How does the governor work? A. I cannot tell you what kind of a governor it was, if the belt should happen to break the governor would turn around and turn the steam off.

Mr. Scott: I would like to know how you would get an even explosion when you have a heavy load on, the gasoline engine I saw exploded once for every two revolutions of the fly-wheel?

Mr. Koch: In answer to that, the gasoline used no more oil than it needed to drive the engine at a certain speed, but where your engine is used to full capacity it will explode oftener as it uses more gasoline.

Mr. Scott: Is that the reason that the gasoline engine would explode with every two revolutions of the fly-wheel?

Mr. Koch: I don't know anything about that, I am just talking from what experience I have had, that is all I know about it.

Mr. Moore: I had the pleasure of calling on Mr. Trowbridge, he uses gasoline in his factory, there separate from his operating room, he likes it very well, the trouble he has, his drive pully is too small for his purpose. I was there while he was operating it, it worked very satisfactory. From what I understand from Mr. Trowbridge that it did not explode every two revolutions of the fly-wheel, but that as it used the gasoline. I also called on the creamery near the station and they gave me very favorable reports on the gasoline engine at that place.

Mr. Whitney: I have used a gasoline engine in a skimming station and found that the power, we had 4 1-2 upright, we did not use the sparker on that in separating, and it exploded—it would not explode more than once in four revolutions. It exploded just as it needed the gasoline. We used a number 1,

Alpha. We found that in about one hour's run we used one gallon of gasoline, we used 4 1-2 horse power. Perhaps for skimming stations as for running steady it is as Mr. Koch says as the steam goes up or down there is a variation. I have found that myself. If the steam would stay at 70 or 80 it would run allright, if it should drop down to 60 pounds he would find there would be quite a variation. When it keeps at 75 or 80 they will find the speed satisfactory, even if from there on it dropps down below 70 pounds they will find quite a variation. We afterwards replaced the gasoline engine with a steam engine.

Question: I would like to ask Mr. Whitney why they replaced the gasoline engine with a steam engine?

Mr. Whitney: The first one had a sand hole in the cylinder and the second one was a second-handed engine and did not last very long. The proprietor of the factory there replaced it with a steam engine that he had at the time.

President Fulmer: If I may ask if that is it, if the amount of gasoline consumed is the amount of power that you require?

Mr. Koch: Yes, sir.

Question: How much milk do you handle?

Mr. Koch: 3,000 pounds of milk a day.

Mr. Hoes: Do you belt direct to the line shaft, if you don't you get a jar?

Mr. Koch: Yes, I do belt direct on the line shaft, but the belt from the line shaft to the jack and the belt from the line jack to the separator takes off the the jar from the separator.

Mr. Clinton: One of my neighbors purchased a gasoline engine last summer to cut ensilage with. It seems that the exhaust was immediately under the engine and that while they were running it started to burn the grass under it. I would like to ask the gentlemen what the cause of that fire was?

Mr. Koch: I am at a loss to say what the cause was, I have never had any experience with an engine of that kind. I have a pipe from my creamery running out about 5 or 8 feet which overcomes anything of that kind.

Mr. Clinton: His explanation to one of my neighbors was that the water in the cooler was too warm, and that was the cause of the fire?

Mr. Koch: I don't know anything about that, that might have been the reason or cause of the fire.

Mr. Clinton: The object of the water is to cool the cylinder, is it?

Mr. Koch: Yes, sir.

President Fulmer: I would like to ask Mr. Koch what would be the practical result if you did not keep the cylinder cool? A. I suppose it would get so hot that it would cement together.

President Fulmer: That is the only reason?

Mr. Koch: That is all I know.

PASTEURIZED CREAM BUTTER FROM THE BUTTERMAKER'S STANDPOINT.

BY J. H. GODFREY.

Pasteurized butter is fast gaining a firm foothold in our markets. Its many good qualities justly entitle it to a prominent place, and within a few years at most it seems probable that as large a percentage of American creamery butter will be made by this process as is the case in the dairy countries of the Old World. If this proves to be true we buttermakers must learn how to make pasteurized cream butter and make it right or give way to someone who can do this. Much discussion and exchange of ideas must take place before all will be fully competent to make such butter.

These conventions of buttermakers are doing much to give us the necessary knowledge, and together with our dairy and buttermakers' papers and dairy schools, make a combination

of educational forces which are gradually fitting the butter-makers to take up this work intelligently.

When pasteurized cream butter was first talked of several years ago there were few buttermakers who could make a fancy article of pasteurized butter because very few knew much about pure culture starters or dairy bacteriology.

The starter question has been pretty thoroughly threshed out, and today but few buttermakers make butter without some kind of starter. The use of commercial starters is steadily increasing. This starter study has incidentally made amateur bacteriologists of the buttermakers.

Some knowledge of dairy bacteriology is necessary to successfully make butter—the more the better—and quite an extensive knowledge is necessary to make pasteurized cream butter. The only difference between making it and the other kind is in cultivating a crop of proper species of germs in the cream after you have thoroughly prepared the soil by exterminating by pasteurization the previous inhabitants growing there. To keep the species pure and to control the cream ripening absolutely, is then, the chief end of the buttermaker who makes pasteurized cream butter.

The routine of making pasteurized cream butter is not materially different from making raw cream butter, except that after separating and before ripening the cream is heated to a high temperature, from 170 to 190 degrees F., and rapidly cooled. This makes more work for the buttermaker as he has one more machine to watch, clean and care for, but if the pasteurizing machine is a good one it is not very difficult to operate, as the only thing necessary is to see that the temperature is evenly maintained and high enough to do efficient work. The machine should have ample capacity to handle all the cream as fast as it comes from the separator and should not be crowded beyond this point as the heating surface will become so intensely hot as to cook the cream on the sides which further impairs the efficiency of the machine and is

very difficult to remove. I have worked for two hours cleaning a pasteurizer which had been overcrowded and consequently overheated. Even concentrated lye failed to loosen the stuff that sticks to the hot tin.

The cream is cooled directly from the heater to a ripening temperature from 65 to 75 degrees F., depending upon the season of the year. And then the starter added. In practice I usually add the starter as soon as the bottom of the cream vat is covered. From fifteen to twenty-five per cent. of the weight of the cream is added. Such a large proportion is advisable as after having rid the cream of practically all germ life for the purpose of introducing your "favorite variety" it is best to add a plenty of them. When ripening cream I want it to ripen. A large per cent. of starter and comparatively high temperature are used. I like this method of ripening in any case as it enables me to get the cream ripe and when cooled down is finished and off my hands until churning time. Keeping at a low temperature for several hours also gives an excellent body to the butter.

The churning is done at the same temperature as for raw cream.

At the University Creamery we make pasteurized cream butter and raw cream butter intermittantly. Sometimes both on one day, as it is necessary to give instruction in making both ways, and the only difference in the method of making is to run the cream through a pasteurizer and cooler before ripening in the case of pasteurized cream butter.

Much has been said about decreased yields when making pasteurized butter. A careful examination of our daily records for the past two years does not reveal any noticeable difference. The average buttermilk test for twenty churnings of raw cream was .14 per cent. and from a like number of churnings of pasteurized cream was .16 per cent., a very small difference. Also the churning of pasteurized cream averaged 80 pounds more to the churning and the churn was

frequently overloaded. The results are on the whole very favorable to the pasteurized cream. The time of churning was also nearly the same, 49 minutes for raw and 51 for pasteurized.

Butter made from pasteurized cream has fully as good body as that made from raw and will stand as much working without injury to the grain. The flavor is very delicate, clean and creamy. The flavor depends almost entirely upon the starter and great care must be taken to insure a good starter at all times.

During the past two years at the Wisconsin Dairy School Creamery we have experimented a great deal with pasteurized butter, have had a large number of lots scored in the markets and find that the score on fresh pasteurized cream butter is as high as from raw cream. The pasteurized butter has better keeping qualities. From May 15th until July 15th, 1902, we made and placed in cold storage 110 sixty-pound tubs of pasteurized cream butter. This butter was withdrawn after having been in storage for an average of six months and kept much better than that stored in 1901, made from raw cream. Two tubs from churnings of June 16th, one raw and one pasteurized, were scored by Mr. Collyer six and one-half months after making 31 and 34 respectively or three points in favor of the pasteurized. Pasteurized butter is also much more uniform in quality. We have a critical trade for a large part of our butter in Madison and I have yet to find a single case where the pasteurized butter does not give as good satisfaction as the raw.

These experiments are only preliminary to more extended work in the future. They are reinforced by some very good showings made at the various conventions held this season.

As I said in the beginning, pasteurized butter has come to stay. Its many merits and advantages are steadily gaining. Enough work has been done to prove that it is a better way than the old way. The buttermaker who would keep to the

front must be capable of making fine pasteurized cream butter. Wisconsin cannot afford to be behind the other states in this matter.

I would urge all buttermakers who are not already competent, to prepare themselves for this line of work by learning all you possibly can about pasteurization and starters. When the time comes, as it surely will, you can go ahead with the confidence which comes from thorough preparation. Your reward will be increased usefulness to your employer, honor to your calling and profit to yourselves.

PASTEURIZED CREAM BUTTER.

BY J. E. AMEND.

Mr. Chairman, Ladies and Gentlemen:

For the great and undeserved honor which has been extended to me to read this paper before such intelligent members and representatives of the Wisconsin Buttermaker's Association I beg to express my heartfelt appreciation.

As I understand it, these conventions and gatherings are for the sole purpose of educating ourselves, in exchanging ideas and experience with one another of the different methods we apply in our vocation as buttermakers, therefore I have prepared my paper on Pasteurizing Cream for buttermaking and will in brief give you my experience and ideas about the method.

When first approached on the subject, and being assured that by this method a buttermaker could absolutely control the bacteria in the cream, in fact, when properly applied could destroy all bacteria present, the good or desirable as well as the bad or undesirable and then by means of a pure culture seed a new and desirable bacteria which would produce the required flavor, I made up my mind to give it a trial and as soon as I could obtain the necessary appliances I commenced to make butter from pasteurized cream.

At first, of course, we found it up-hill work, but I knew there was no satisfaction in making the normal article for one day my butter was alright and a few days hence my butter was all wrong, and after applying pasteurization for a short time I noticed quite an improvement, especially on butter made from poor and tainted cream, so we experimented along and took advantage of the bulletins sent out from the Experiment Station at Madison, and with the information I could gather from others together with my own experience we soon noticed an improvement on our butter on points where at first we had been lacking, and after the first year we had but an occasional complaint on our butter, and now we are getting a premium; now I don't mean to say that we are the only ones that get a premium for butter and this because we pasteurize, there may be some of you present here that get more for their butter than we do, there may be some of you that have the co-operation of the patrons where the patrons have the success of the factory at heart, (which, of course, means their own individual success as well) who will cure their milk in best possible manner and to the best of their ability, such milk can be made into good butter and of good keeping quality; but what I mean is in such cases as ours where competition is strong, and which I think it is with most every buttermaker, and you have to take milk and cream of all description, cream from hand-separators, water-separators, skimming stations, and in fact all kind of cream, some tainted and partly acid when it arrives at the factory, and can then demand and receive a premium on the butter made from such cream it must be the right method to develop, and it must even render an improvement on butter made from good cream, for we find that Denmark pasteurizes 95 per cent. of cream and milk made into butter, and while dairying is their main industry, the producer certainly tries to deliver his milk as near perfect as possible, and still they find it an improvement to pasteurize. Now let us consider the relation between factory and consumer (what I mean is the keeping quality and flavor)

is it not a fact that the greatest difficulty we have to overcome on normal butter is its keeping quality? Don't we frequently have complaints from our local customers about the last of the jar of butter being strong? In regard to this let me say that we ship butter to private customers into a good many states in the Union and among them one particular one who gets 30 pounds to a shipment and lasts him six weeks, and he says the last is as good as the first. Now in regard to the high flavor generally demanded by the trade let me ask you, what produces flavor? Is it not Bacteria? and is it not true (now I appeal to your sound intelligence and experience) is it not true I say, that when you receive milk which you often think and know you ought to reject, on account of being tainted and off in flavor, but when your butter is made from such milk is it not of a very high flavor? in fact of a higher flavor than when your milk is delivered in good shape, don't this prove that Bacteria produces flavor? it further proves that the bad and undesirable Bacteria which has gained access and developed in the milk before you received it, plays just as important a roll in producing the *high* flavor as the good bacteria, another proof is, butter made from poor milk with this high flavor is of very poor keeping quality. Now let us consider the effect of Pasteurizing cream from poor milk, we will by Pasteurizing, destroy all Bacteria and you have a steril cream to work on, consequently your butter must come with a clean sweet flavor, when all other conditions necessary are fulfilled after Pasteurizing the cream, I will admit that butter made from poor cream, although pasteurized, has not so delicate a flavor as from good cream, but it is nevertheless sweet and clean in flavor and of good keeping quality. The greatest objection we had when we first commenced to pasteurize was the so-called cooked flavor, now, this is something of the past, about the only objection raised on our butter now is the mild flavor; but let us consider this; from the consumer's standpoint why did oleo gain such fame throughout the country? is it on account of its high flavor? Indeed not,

but I have heard people, and well-read people, say they would sooner eat oleo than butter simply because it was made cleaner, tasted cleaner and sweeter, and was more uniform and of better keeping quality. Now it appears to me if our country at large would adopt pasteurization which enables us to make just as clean and sweet flavored butter as oleo has, together with a higher flavor, and of uniformity and keeping quality equal to oleo, it would not be but a very short time before people would get over this faint idea of demanding a high flavored butter, which we know wont keep for any length of time, nor is it uniform on account of the different kinds and amounts of bacteria present; and we ought to educate ourselves thoroughly to the effect which bacteria has on butter so we could approach the consumer and explain to him and convince him that bacteria produces the flavor, and the more bacteria butter contained the higher the flavor, and the less bacteria it contained the milder the flavor. Many of you remember that only a few years ago you heard people say, I don't like creamery butter, but while they used it right along they got used to it; just the same applies to pasteurized butter, if the public is educated to what it is, and what it means it won't be long and they will demand pasteurized butter. To illustrate.

If the consumer knew he could go to any store and always get a pound of butter which had a clean sweet flavor and was of such keeping quality that they could use it up even in hot weather, same as oleo, without ice (which a good many in cities cannot afford) then the public at large would demand butter instead of oleo, and if the grocer they are trading with would sell them oleo for butter, because he can make more margin on it, the customer would soon turn down this shark and look up an honest grocer who would sell him butter when he demanded it, but when on the other hand, the shark sells him oleo for butter and he finds that it is of a more uniform grade, sweeter and cleaner in flavor, and of a better keeping quality, why should he not use it? It is my candid opinion from what experience

we had along this line if the buttermakers of this association would adopt pasteurization and develop it, it would open a new market for our butter in foreign countries, as well as increase the demand in our home markets.

Mr. Fulmer: I know of some experiments having been made about five years ago, they experimented on quite a large scale, they using cream from perhaps 16 to 18 thousand pounds of milk a day and the conclusions that they arrived at were that it cost perhaps one cent a pound to pasteurize; but under the same conditions they received three cents per pound more for the pasteurized butter than for the raw butter.

Mr. Godfrey: I know that in our case it did not amount to one cent a pound. Our power is electric power and the wood that we consumed was used for heating purposes. The wood consumed was not over perhaps one-eighth of a cord per day; that is the only additional costs or expense except washing and the time spent to clean the pasteurizer. There is no other expense except in heating the cream. In making pasteurized butter it does not cost very much more. If you are heating the milk it might be a little more expensive operation.

The President: As this completes our program for this afternoon I will now announce the committees:

Committee on Resolutions: James Q. Emery, H. B. J. Andrus, W. A. Stewart.

Committee on By-Laws: J. G. Moore, E. L. Duxbury, J. Wunsch.

The following resolution was offered by Mr. Moore.

WHEREAS, we learn with deep regret of the illness of his Honor, the Mayor of Waukesha, Mr. George Harding, therefore be it

Resolved, That this association extend to him our sincere sympathy and hope for his speedy recovery, and further be it

Resolved, That the secretary send a copy of this resolution to Mayor Harding.

The President: If there is no further business an adjournment will be taken until 8 o'clock this evening.

Convention met at 8 P. M. with President F. B. Fulmer in the chair.

The President: Gentlemen, we have with us a man who has charge of one of the large institutions of this state, I will call up Prof. Hutton now of this city.

ADDRESS BY PROF. HUTTON.

Ladies and Gentlemen: I don't know exactly why I am up here, whether it is because the gentlemen asked me to come or because I am a farmer out here. I have a farm out here of about 400 acres, more or less, cows, horses and such things usually found on the farm. And about 300 boys—and about 300 of the worst boys of the state—to run it with.

It is a long time since I have been a farmer. My father came into the wilderness in northern Wisconsin, when we got here in 1857, there was nothing north of us but Lake Superior, and north of that we thought there was the north pole. We started out to raise wheat; I remember we did raise some pretty good crops 20 bushels to the acre we kept at it when we got to raising the measly chinc bug so I left the farm.

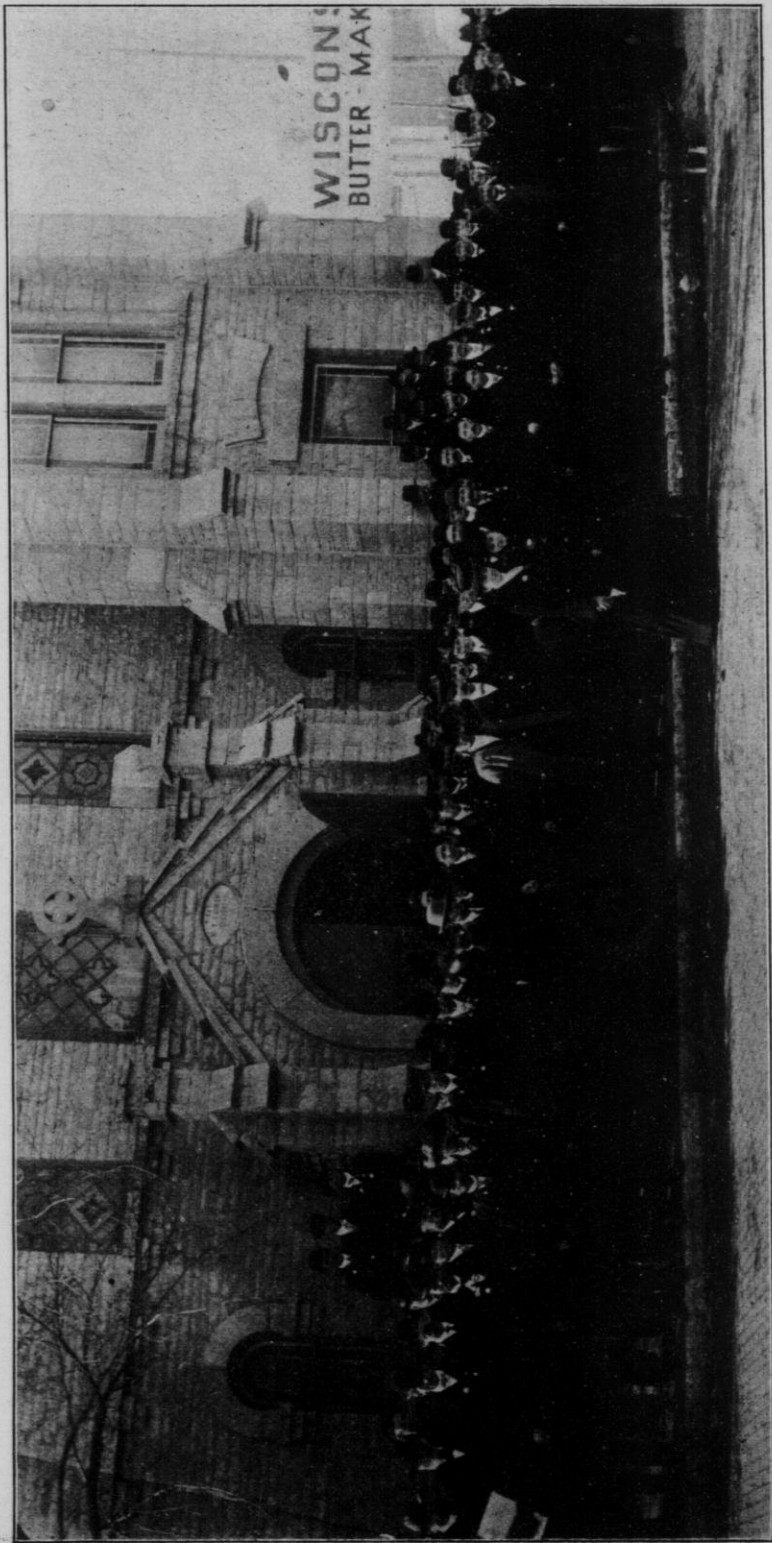
I have not thought of it until I got on the platform some one asked me how I liked the farm. I told him I liked it as well as any job that I ever struck since I left the farm. I don't know what all the machines are for down stairs, we did not have any of those contrivances when I lived on the farm. I remember how I used to drive Buck and Bright, I think I could put them anywhere where an expert teamster could put them.

I did not scrutinize the machines that you have down below as their objects are incomprehensible to me although I am a farmer. I stand and look at them pretty much as I saw a Chinaman look at the exposition down in Chicago. All I have got to say that we have not reached very far in agriculture

yet; agriculture is the most honorable calling that we have. We are just starting at "A." We do more by brains now than by skill. We are just at the beginning.

Now the population of the country is increasing with extreme rapidity and every acre must produce more than it used to produce before. The number of acres will remain just the same as before. Our desires are increasing, are increasing every day. Let us start in to make butter that sells for 30 cents a pound. It is a curious thing that when I hear that butter goes up I rejoice and I am quite a large buyer of butter. The time is coming when we have to count on the farmer. Farming that's where skill was formerly employed is now done scientifically. The day of the scientific farmers are upon us. Every acre must produce more and more as the years go by. We are just at the beginning of the new agricultural era.

I was thinking of the conditions in which my father and I undertook to do work on the farm on the wild Indian lands. As I came down to hear what my old friend Professor Emery has to say. I have listened to him many and many a time as a school teacher in all its departments. I came here to hear him speak on a good subject. He has plans for the future to carry out in that work. He is always planning what he wants the people to do what he wants the legislature of the State of Wisconsin to do. I think he will raise the standard of the farmer and of those people that are interested therein and on that account I am a farmer.



THE WISCONSIN BUTTERMAKERS' ASSOCIATION ANNUAL MEETING, WAUKESHA, WISCONSIN.

DAIRY AND FOOD INSPECTORS.

Creamery Inspectors.

BY HON. J. Q. EMERY, WIS. STATE DAIRY AND FOOD
COMMISSIONER.

When your secretary, a few weeks ago, invited me to occupy a brief portion of your time on the subject of "Creamery Inspectors," I accepted his invitation and stated that I should probably enlarge the subject and discuss the broader question of "Dairy and Food Inspectors."

The Dairy and Food Commission was organized through the efforts of the Wisconsin Dairymen's Association and the dairy interests in 1889 for the purpose of protecting that important industry from fraudulent competition and to secure the delivery of unadulterated milk at the factories. The force was then made sufficient to cope with the work at that time which covered only the enforcement of the dairy and vinegar laws.

Since the organization of the Commission, the dairy industry has increased three-fold. In 1902 it reached a production including all by-products whose estimated valuation is \$55,000,000. The demands, upon the Commission have become correspondingly large. In addition, the Commission has been charged with the enforcement of food laws covering all substances used for food or drink, the laws governing the sale of drugs, linseed oil, colored grain, and impure ice. But this greatly enlarged scope and work of the Commission has not been accompanied with a corresponding increase in the working force of the Dairy and Food Commission.

Let us briefly consider the work required of the Commission by the laws of the state and the consequent necessary amount of labor to meet these requirements.

The number of groceries in the city of Milwaukee alone is 780; the number in the state, including the general stores, is 5,582, stated in round numbers.

The grocers of the state are fully up to the average of other merchants and citizens in morality and resent with some degree of justice, prosecution for the sale of food products about which they have no ready way of obtaining information and against which they have not been warned.

It would seem that the most effective and rational way of enforcing the food law would be by thorough inspection of the stores, explaining to the merchants the scope of the food laws, and stating specifically what goods are salable and what are not, following this shortly by other visits to see if the warnings have been heeded. After such inspection and warning, prosecutions can be made in the interests of the people as a whole and without injury to any.

Now, let us estimate the number of men that would be required to do this work. One competent, energetic man can visit and properly inspect not to exceed four groceries a day, on the average not more than twenty-two a week. Allowing fifty working weeks for the year, one such man could properly inspect not to exceed 1,100 groceries in a year, and at this rate it would require not less than five men to inspect properly the 5,500 groceries in the state. This is an underestimate of the necessary work required.

The number of city dairies is estimated at 150. The number of retail dealers in oleomargarine approximates 800, which does not include the hotels, boarding houses and restaurants requiring inspection under the law, which number it is estimated cannot be less than 4,500.

In order properly to cope with this work, the time of at least one inspector should be occupied, as is now the case, in ferreting out the fraudulent sales of oleomargarine in hotels and restaurants, and in stores where it is sold, and during the summer months, when there is less incentive to fraud in the above

direction, his time would be occupied in the inspection of the milk supplies of the various 115 cities of the state.

If the inspection of cheese factory and creamery milk is to be continued along the same lines that it has been in the past, the demand is such that two men will be constantly needed at this work. There is now only one man for this line of work and he cannot devote all his time to the same. But if the inspection is to be widened in its scope, as the necessities of the case already require, so as to keep pace with the work already being done by our immediately surrounding neighbors, and with a view to protecting the public against unclean and even deleterious dairy products, then a very much larger number of competent inspectors is necessary.

There are, in round numbers, about 3,000 creameries and cheese factories in Wisconsin. The number of creameries and cheese factories in this state is greater than in any other state of the Union. These creameries and cheese factories are daily receiving milk from a multitude of patrons, who offer the milk in varied degrees of cleanliness or uncleanliness, and, consequently, in as varied sanitary or unsanitary conditions. These creameries and cheese factories are daily manufacturing this milk of such varied conditions as to cleanliness and wholesomeness into food products for consumption by the public. Here the exercise of the police power of the state becomes necessary to secure to the public clean, pure and wholesome dairy products. This great dairy industry cannot be regarded as merely a private business enterprise. When the dairy industry offers to the public an article of food for general consumption, it is a proper concern of the state that the food product thus offered her citizens be genuine, clean, unadulterated and wholesome.

One competent, energetic person can visit and properly inspect not more than four creameries and cheese factories in a week. To make his inspection efficient or effective, he must spend the morning hours of each day in inspecting the milk received into the creamery or factory, for upon the quality of the

milk received depends in large measure the quality of the butter or cheese product. Allowing fifty working weeks in the year, one man could inspect not to exceed 200 creameries or cheese factories yearly. This amount of work is believed to be an over-estimate of what any one man can accomplish. Surely no one man could do more. Now, allowing 200 creameries or cheese factories to be inspected in a year by one man, it would require fifteen men to inspect once a year each of the 3,000 creameries and cheese factories in the state.

Thus far no mention has been made concerning, nor has any action by the Dairy and Food Commission been taken toward, the enforcement of the drug laws nor the food laws with reference to beverages, liquors and confectioneries. Such work as has been undertaken has been done largely through the assistance and co-operation of the Wisconsin Wholesale Grocers' Association. When, in addition to the foregoing, it is remembered that the Commission has been charged with the enforcement of laws relating to linseed oil, colored grain, and impure ice, and it must become apparent to any intelligent, candid mind, that a force of not less than 26 competent persons is required to perform efficiently and effectively the work which has been imposed upon the Commission by the legislature of the state.

Now, what force has been given to the Dairy and Food Commission for this great and useful work for the vast body of our citizens? Let me tell you, that for this vast amount of work of such vital importance to the public, a force of but five persons has been provided by the legislature, viz: a commissioner, an assistant commissioner, a chemist, a city dairy inspector and a confidential clerk.

What force does Minnesota provide for her dairy and food commission? By her law, she provides a commissioner, assistant commissioner, secretary, chemist, assistant chemist, and eleven creamery, cheese factory and milk inspectors—a force of sixteen persons.

The Iowa Creamery Journal, referring to the results of the National Buttermakers' Convention recently held at Milwaukee, remarked that when the scores of butter were read there was a dull thud of surprise and that the thud still reverberates throughout the land. That thud of surprise was caused by the lead that Minnesota gained over her neighbors in her high scores of butter. Accounting for this result, that Journal goes on to say: "What we wish to emphasize particularly is that Minnesota has a corps of instructors who go from creamery to creamery and give instruction which instructs. The creameries are kept more abreast of each other and the flavor which was produced in one of the Minnesota creameries was pronounced the finest of all, and the buttermaker who made the butter in the creamery was one of those detailed to travel and teach others how to follow suit. With newer buildings, with up-to-date machinery and apparatus and with a sufficient number of fully qualified instructors busily employed in looking after the dairy interests in the creameries and among the patrons, a higher average score than in Iowa, where there is a sad lack of these respects, results as effect follows cause."

What is said of the cause of Minnesota's lead over Iowa in these particulars applies with some force when comparing Wisconsin with Minnesota conditions and the need of more creamery inspectors.

What does the State of Michigan do for her Commission? By her law she provides a dairy and food commissioner, a deputy commissioner, an analyst, an assistant analyst, two clerks and six inspectors,—a force of twelve in all.

What does the Dominion of Canada do for her dairy interests? The Province of Ontario, with a thousand cheese factories, employs sixteen instructors and deems that number insufficient. The Province of Quebec employs fifty such instructors.

With such provisions made by our surrounding neighbors, unless Wisconsin makes more adequate provisions in these particulars, it seems inevitable that she must fall behind her com-

petitors in the markets for her dairy products and become a dumping ground for inferior and adulterated food products that are rejected by our neighbors.

A bill was introduced into our legislature providing for an assistant chemist and four additional dairy and food inspectors. This would bring the entire force of the Wisconsin Dairy and Food Commission up to ten, still less than either Minnesota on our west, or Michigan on our east. Yet it has been hinted in certain quarters that this is an unreasonably large number to ask. Certainly, in view of the facts of the case, the unreasonable proposition would be that the work could be done effectively with a less number of people.

It has been well and truthfully said by former Commissioner Adams, "The food question is a serious one. It is important to every man, woman and child in the land. It concerns the public health. It touches the public pocket. Pure food laws were designed for the protection of both. Their necessity has been recognized by every European government, with England leading in 1875. Every American state has pure food laws, except Wyoming and Arizona. These laws are not class legislation. They are primarily for the benefit of consumers who include all classes. Incidentally they help the producers of honest articles of food. Beyond question they are oppressive to men who try to get something for nothing and whose love for a dollar is greater than their regard for the public health. It is not fiction that unhealthy adulterants are used in many food products. Under the labels of 'Freezine,' 'Preservaline,' 'Liquid Sweet,' 'Liquid Smoke,' 'Rosaline,' and other fanciful names, they are manufactured by hundreds of tons, placed in every market in the United States, shipped to foreign countries in immense quantities, and advertised with a skill and effectiveness that compels public attention.

Wheat flour is adulterated with corn flour; buckwheat with wheat middlings; Vermont maple syrup is made that never saw Vermont, and is made from the sap of trees that grow in the

heart of Chicago. Glucose has dethroned cane syrup. Cider vinegar is distilled from grain. A good portion of the strained honey of commerce never produced any strain upon the bees. Milk has been robbed of its cream, filled with lard and sent all over the world to ruin the reputation of American cheese. Borax and formaldehyd go into milk to kill babies and weaken invalids. Oysters are partially embalmed with chemicals. Lemon extracts are made without lemon oil and vanilla extracts without vanilla. The hogs of the north compete with the cheap cottonseed oil of the south and mix in the same tub under the banner of lard. Jellies colored in imitation of natural fruits and sold as fruit jellies flood the market, although they are almost as destitute of fruit juice as a bar of pig iron. Cheapness is secured by adulterations and false labeling, but the people are defrauded."

Pure food laws, effectively enforced, are of the utmost importance to every man, woman and child in the state. More creamery inspectors, more cheese factory inspectors, more food inspectors are necessary in Wisconsin.

The President: In this day and age of the great competition to butter, there is something which buttermakers are interested in, it is the composition and detection of oleomargarine; the dealers are interested and one thing that is thought of a great deal by the public, is how to detect oleomargarine. Many men tell us that they know that they have eaten it but don't know how to detect it. We will now listen to Prof. Richard Fisher on that subject:

The President: The next on the program is a paper by James Q. Emery on Creamery inspectors.

THE MANUFACTURE AND DETECTION OF OLEOMARGARINE.

BY DR. RICHARD FISCHER, STATE CHEMIST.

Although the word oleomargarine was first used in this country as the patent name for a particular kind of artificial butter, it is now applied according to United States law to all substances of animal or vegetable origin made in imitation or semblance of butter. While the names "oleomargarine" and "butterine" for such butter substitutes are most common in this country, the general name for them in Europe is "margarine," with such synonyms in England as "bosch" and "Dutch butter."

The adulteration of butter by actually incorporating with it more or less lard, dripping, tallow or similar fat, dates back many years, but could never be extensively practiced because of the disagreeable taste of the resulting product. The discovery of a substance which could be added to butter without greatly changing its taste, melting point or physical appearance, and which in fact could be sold by itself as a substitute for butter is of comparatively recent date.

It was at the suggestion of Emperor Napoleon III, of France, whose desire it was to furnish to the poorer classes and to sailors an article which should be cheaper and more stable than ordinary butter, that the French chemist, Mège-Moriès, in 1869, was led to undertake the manufacture of a palatable substitute for butter from the fat of animals slaughtered for food. Mège-Moriès endeavored to imitate the physiological process which he supposed takes place when cows are insufficiently fed and when, therefore, the butter which they furnish is derived from their own fat. From beef he obtained a "fat" which, to use his own words, "melted at almost the exact temperature of butter, possessed a sweet and agreeable taste, and which for most purposes could replace ordi-

nary butter, not of course the finest kinds, but which was superior to it in possessing the advantageous peculiarity of keeping for a long time without becoming rancid."

Before the breaking out of the Franco-Prussian war, Mège established a factory at Poissy and during the siege of Paris (1870-71) large quantities of the new article of food were used, which then obtained such a strong hold on the people that at present Paris alone consumes 60-80,000 pounds daily. The English government granted a patent to Mr. Mège in 1869, and on December 30, 1873, the process was patented in this country.

For a proper understanding of the process of making artificial butter from animal fats it must be remembered that animal fats are in the main mixtures of three chemically similar substances, commonly known as stearin, palmitin, and olein. Commercially the name stearin is applied to a mixture of stearin and palmitin, both of which are solids at the temperature of the human body, while pure olein is a liquid even at the temperature of freezing water. The melting point of any fat depends mainly upon the relative proportion of these three constituents, mutton tallow containing more solid fat than beef tallow, while lard contains less than either. These fats by themselves cannot be used as butter substitutes because when taken into the mouth only a part melts, while the remaining solid fat cleaves to the tongue and the roof of the mouth. One of the main aims in the process of making artificial butter from animal fat, therefore, is to remove a portion of the stearin and palmitin so that the remaining fat has approximately the consistency and melting point of butter. Another point to be observed is that the rendering of fats at the temperatures generally employed gives to them a disagreeable flavor which is almost entirely absent when the operation is conducted at comparatively low temperatures.

The method of procedure for making oleomargarine according to Mège's process may be divided into four stages:

1. The washing, hashing and melting of the raw fat; 2. Crystallization of the rendered fat; 3. Separation of the solid from the liquid fat; 4. Churning of the oleomargarine. The inventor describes the process as follows: "The fat of best quality from recently killed bullocks is finely cut in a kind of sausage grinder in order to break up the membranes. The fragments fall into a tank heated with steam, which for every 1,000 pounds of fat contains 300 pounds of water, 1 pound carbonate of potash (for this was afterwards substituted calcium acid phosphate) and two minced sheeps' or hogs' stomachs. The temperature of the mixture is raised to 113 degrees F. After two hours, under the influence of the pepsin in the stomach, the membranes are dissolved and the fat melted and risen to the top of the mixture. The fat is next allowed to cool, when upon standing at about 86-98 degrees F. the solid fats separate more or less completely in a crystalline form, so that when wrapped in cloths and expressed by means of an hydraulic press a separation is accomplished into 40-50 per cent. of stearin (used in candle-making) and 50-60 per cent. of fluid oleo. This latter when cooled was used either directly for culinary purposes or was churned with milk and cream and after cooling rolled like butter.

Although many patents have since been issued for the preparation of artificial butter, much of that prepared at the present day is made according to processes analogous to the original, excepting that the digestive operation is omitted. Two of the largest packing houses in this country describe their process of manufacture as follows:

The fat is taken from the cattle in the process of slaughtering, and after thoroughly washing is placed in a bath of clean, cold water, and surrounded with ice, where it is allowed to remain until all the animal heat has been removed. It is then cut into small pieces by machinery and cooked at a temperature of about 150 degrees F. until the fat, in liquid form, has separated from the fibrine or tissue, then settled until it is

perfectly clear. Then it is drawn into graining vats and allowed to stand a day, when it is ready for the presses. The pressing extracts stearin, leaving the remaining product, which is commercially known as oleo-oil, which, when churned with cream or milk or both and usually a proportion of creamery butter, the whole being properly salted, gives oleomargarine.

In making butterine neutral lard is used, which is made from selected leaf lard in a very similar manner to oleo-oil, excepting that no stearin is extracted. This neutral lard is cured in salt brine for 48-70 hours at an ice-water temperature. It is then taken, and, with the desired proportion of oleo-oil and fine butter, is churned with cream and milk, producing an article which, when properly salted and packed, is ready for market."

While the above probably describes the preparation of some of the best grades of oleomargarine, the cheaper qualities are made according to other processes. The substitution of vegetable oils (in this country mainly cottonseed, in Europe sesame, arachis and purified cocoanut oil) for a portion of oleo-oil and neutral lard is much practiced; in fact, some brands are said to be prepared from uncrystallized fat by the mere addition of a sufficient quantity of oil to give to the mixture the proper consistency.

The number and character of the ingredients of oleomargarine make them susceptible of almost an infinite number of combinations, and each manufacturer has his own working formula. So much depends on the handling of the oils and the regulation of temperatures surrounding them at each successive step, that different manufacturers using the same quality of ingredients in similar combinations will secure vastly different results. The following formulae for three distinct grades of oleomargarine taken from the Twelfth Census of the United States, show the use of different ingredients and their variation in quantity:

FORMULA 1 — CHEAP GRADE.

Oleo oil.....	495 lbs.
Neutral lard.....	265 "
Cottonseed oil.....	315 "
Milk.....	255 "
Salt.....	120 "
*Color.....	1 $\frac{1}{4}$ "

Total..... 1,451 $\frac{1}{4}$ "

Will produce 1,265 to 1,300 pounds of oleomargarine.

FORMULA 2 — MEDIUM HIGH GRADE.

Oleo oil.....	495 lbs.
Neutral lard.....	500 "
Cream.....	280 "
Milk.....	280 "
Salt.....	120 "
Color.....	1 $\frac{1}{2}$ "

Will produce about 352 pounds of oleomargarine.

FORMULA 3 — HIGH GRADE.

Oleo oil.....	100 lbs.
Neutral lard.....	130 "
Butter.....	95 "
Salt.....	32 "
Color.....	1 $\frac{1}{2}$ "

Will produce about 352 pounds of oleomargarine.

This report also contains the following:

After a description of the methods of manufacturing its principal ingredients, the manufacture of oleomargarine itself may be described briefly. In those independent plants where both oleo-oil and neutral lard are purchased for use, melting-tanks are provided for each, in which they are melted separately, after being taken from the tierces in which they are shipped. They are then piped or pumped to a mixing tank mounted on weighing scales, where the exact proportions demanded by the working formula are ascertained. If cottonseed oil is required by the formula, a separate tank for it is usually provided. If

* It must be remembered that this was written before the enactment of the United States law of 1902, regulating the manufacture and sale of oleomargarine.

butter is to be used instead of milk or cream, a separate melting tank is also provided for that. After the oils are melted and weighed into the mixing tank together, the mixture is piped or pumped into the churn, where it receives the milk and coloring matter. The whole mass is then churned together.

In the packing houses liquid oleo oil and neutral lard are piped from the oil room direct to the weighing tank. After churning, the liquid oleomargarine is allowed to flow into a vat of ice water, which chills and hardens it before crystallization can take place. It is next shoveled into mounted cars and wheeled to the "tempering room," where it stands for several hours, until sufficiently softened for the machine butter-workers. After the salt has been worked through it, it is put up in the different forms used in the trade, and is stored in refrigerators to await shipment.

While there is substantial uniformity in the process of manufacture, there is great diversity in the grades and combinations of material used, and consequently, in the character of the finished article.

The cheapest grades of oleomargarine found on the market are made from the lowest grades of oleo-oil and neutral lard, to which is added the limit of cottonseed oil and the whole is churned with skimmed milk or buttermilk, salted with common salt, and colored with the cheaper grade of coloring matter. These low-grade oils may be manufactured from "scrap" fat and made firm by the addition of more stearin or other similar substances, so that a greater proportion of cottonseed oil can be added to the combination. Sometimes glycerine is added to give the product a glossy appearance and sugar or glucose to sweeten and give texture. The highest grades are made from pure oleo-oil and neutral lard of the best quality, churned with whole milk, cream or creamery butter, salted with Ashland salt, and colored with annatto or other coloring matter.

The number of grades manufactured varies from two to six, but all large factories receive orders for special lots to be made

in a prescribed way. A large proportion of the independent manufacturers are making a specialty of the higher grades, which include only the best oleo-oil and neutral, the grade being determined from the quality and character of the dairy product added.

Detection of Oleomargarine.

While the detection of oleomargarine with absolute certainty can only be accomplished by chemical means, a number of methods have been devised which are fairly reliable and can be easily applied by the layman using only such apparatus as can be found in any household. Several of these tests are described in the Farmer's Bulletin, No. 131, issued by the United States Department of Agriculture and it is from this Bulletin, prepared by G. E. Patrick, that the following is largely taken:

In considering these tests we must recognize as a factor, renovated or process butter, which, being prepared from a molten fat, resembles oleomargarine in many respects. The tests may therefore be divided into two classes: 1. Those which serve to distinguish true butter on the one hand from renovated butter and from oleomargarine on the other; and 2. Those by which oleomargarine can be distinguished from true and from renovated butter. The former test can be conveniently applied in the following manner:

Using as a source of heat an ordinary kerosene lamp, turned low and with chimney off, melt the sample to be tested (a piece the size of a small chestnut) in an ordinary tablespoon, hastening the process by stirring with a splinter of wood, e. g., a match. Then, increasing the heat, bring to as brisk a boil as possible, and after boiling has begun stir the contents of the spoon *thoroughly*, not neglecting the outer edges, two or three times at intervals during the boiling—always shortly before the boiling ceases. Oleomargarine and renovated butter boil noisily, sputtering (more or less) like a mixture of grease and water when boiled, and produce no foam or but little. Reno-

vated butter generally produces a very small amount. Genuine butter boils usually with less noise and *produces an abundance of foam.*

The test by which oleomargarine can be distinguished from renovated and genuine butter is somewhat more difficult of application. The utensils required are:

(1.) A one-half pint tin measuring cup, common in kitchen use, marked at the half and quarters; or a plain one-half pint tin measure, ordinary narrow form; or an ordinary small tin cup, $2\frac{3}{4}$ inches in diameter and 2 inches in height, holding about one gill and a half.

(2.) A common kitchen pan, about $9\frac{1}{2}$ inches in diameter at the base.

(3.) A small piece of wood, of the thickness of a match and of convenient length for stirring.

(4.) A clock or watch.

The test is conducted as follows: Use sweet skimmed milk, obtained by setting fresh milk in a cool place for twelve to twenty-four hours and removing cream as fully as possible. Half fill with this milk the half-pint cup or measure, or two-thirds the smaller cup mentioned, measuring accurately the gill of milk when possible; heat nearly to boiling, add a slightly rounded teaspoonful of butter or butter substitute, stir with the wooden rod, and continue heating until the milk "boils up;" remove at once from the heat and place in the pan (arranged while milk and fat are heating) containing pieces of ice with a very little ice water; the ice to be mostly in pieces of the size of one to two hen's eggs (not smaller, as small fragments melt too rapidly) and sufficient in quantity to cover two-thirds of the bottom of the pan; the water to be in quantity sufficient, when the cup is first placed in the pan, to reach on the outside of the cup to only one-fourth the height of the milk within; any water in excess of that amount must be removed. [This refers to the condition at the beginning of the cooling; later, as the ice melts, the water will rise to a higher level.] Stir the contents of the

cup rather rapidly, with a rotary and a cross-wise motion in turn, continually throughout the test, except during the moment of time required for each stirring of the ice and water in the pan, which must be done thoroughly once every minute by the clock. This is done by moving the cup about, in a circle, following the edge of the pan. Proceed in this manner for ten minutes, unless before that time the fat has gathered or has allowed itself to be easily gathered, in a lump or soft mass, soon hardening. If it so gathers, the sample is oleomargarine; if not, it is either genuine or renovated butter. This test is said to be thoroughly reliable except in cases of stale or rancid oleomargarine, which fortunately do not require testing in the household.

While the above simple tests may be considered trustworthy when applied to renovated butter and oleomargarine as sold at the present time, it must be remembered that changes in the ingredients and in the process of manufacture of these products in the future may render these tests fallible.

The President: Gentlemen, as our other speaker for this evening does not seem to be present, evidently through some misunderstanding, this will conclude our program for this evening. But before adjourning I wish to say that the scoring of butter will take place in a room provided for us about half a block away from this hall, tomorrow morning by Judge Collyer. All buttermakers who have entered butter for a premium will be assigned a time for meeting the Judge for the purpose of discussing the merits and defects in their butter. The time not occupied in the scoring of butter can be put in inspecting the exhibits of machinery and supplies in the room underneath this hall.

Convention adjourned to meet at 2:00 o'clock next day.

The convention called to order by the president at 2:00 P. M., February 25, at the Coliseum.

Music.

THE BUTTERMAKER'S LICENSE.

BY HENRY SANDHOLT, GROVE CITY, MINN.

When your secretary, Prof. Farrington, honored me with an invitation to prepare a paper for this convention, I promised him to treat on the subject of Buttermaker's License, a subject which has been much agitated and discussed in Minnesota for the last year and undoubtedly is of like interest to the creamery men of Wisconsin. I realize that it is quite a difficult task for an average every-day buttermaker to get up before a meeting like this, where you have with you so many prominent men who are able to discuss the different problems which confront us far better than I am able to do it, a fact I assure you, which makes me feel mighty small—still, I have attended quite a few conventions myself, and it always did me good to listen to a fellow buttermaker, fresh from the creamery; even if he does not present his views in the very best form, he is generally in earnest. I shall not try to urge on you the advisability of you taking up this question of Buttermaker's License, but merely endeavor to submit a few suggestions so as to start the ball rolling.

In order to make a law providing for a buttermaker's license, or maybe better, certificate, useful and of benefit to the trade, its advocates in Minnesota are strongly in favor of, say, three different grades or classes of certificates; to be issued by a board, designated by law, upon recommendations of inspectors, representing this board; the recommendations of these inspectors to be based on those conditions in a creamery, that a buttermaker is always able to control. The actual conditions of the creamery should be the main point to be considered in giving out the license, and while an examination in chemistry and bacteriology would be very appropriate together with the inspec-

tion, a law that only called for such an examination without actual inspection of the applicant's creamery would, I believe, prove worse than nothing. Most men can pick up knowledge enough to squeeze through an examination, but all men do not practice every day what they believe in, when standing before a board of examiners.

It has been suggested that a creamery license law would be of just as much benefit, and I believe it would—if you creamery men of Wisconsin should find this plan more practical, you certainly should work together and have your legislature pass such a law.

But now in regard to the buttermaker's license! Would such a law benefit the creamery patron, the farmer? This question seems to me to be the most important in connection with this subject, because if a license, a certificate law would prove detrimental to the interests of the patrons, the buttermakers, however, anxious to see such a law enacted, would have a very hard time to get any legislature to act according to their wishes. In Wisconsin, as in Minnesota, the creamery business is largely conducted on the cooperative plan, and it requires a certain amount of knowledge on the part of the creamery boards to properly check off the work of the buttermaker. This knowledge is very often lacking, and therefore we see a good many creameries use a whole year to find out whether or not their buttermaker is earning his salary. A strictly enforced license law would to a great extent guarantee the stockholders of a creamery that their buttermaker was doing the right thing. The only objection that so far has come from the farmers has been that the enforcement of such a law would raise the wages, in fact I know of men who believe the whole thing to be a scheme on the part of the older men to corner the market on buttermakers, so to speak, by keeping the young men out, thus forcing the salaries up. I believe the system under which we are working today keeps more good young men out of the business than the license system would, and while I do not believe that a license law would

tend to raise the wages to any extent, I do believe that they could stand to be raised a notch or two without injuring the profits of the farmers. In some states the barbers, for instance, have a license law, and while I am not prepared to say that it has not raised the price of a shave—a fact which I doubt very much—I would like to see the man in this audience who would not prefer to pay 15 cents in a clean shop to 10 cents in a dirty.

If a certificate law would be of benefit to the creamery companies, especially the cooperative ones, by protecting the farmers from being imposed upon by wholly incompetent men, such a law properly carried out would be of still more benefit to the buttermakers themselves.

The successful buttermaker of today is bound to serve an apprenticeship of two years, working hard at very small wages—in fact, he is doing exceedingly well if he in that time can save up money enough to carry him through a term at one of the dairy schools. He is bound to know a good many things and put in hard work every blessed day in the year, also he is bound to have in him the qualities which go to make up the successful business man: honesty, tact, perserverance. His occupation is, to put it mildly, not always the healthiest—we do not find many old buttermakers, but we do find, I believe, that six out of ten men are trying to quit the business as soon as possible. In the struggle for a living the competent man is thrown in competition with the one, who, after serving a very short apprenticeship, gets charge of a creamery by working at lower wages than qualified men can afford to go for. A license law requiring applicants to state time spent in learning the trade, would do away with these, as some one has called them, “snapshot” buttermakers, and thereby prove a blessing to the whole creamery industry.

We hear so much about butter-making as a profession, and we hear so much about raising this profession in the eyes of the public—would not a license law help us to do this? It would eliminate the cheap, unqualified man, who by accident

drops into the business, not with the purpose of making it his life occupation, but for the sake of making a mere living until something better shall turn up, thus making the profession of buttermaking a distinct one. It would also give the buttermaker some often very necessary backing in dealing with the creamery boards and lend more weight to his judgment and advice. The feature of having such a law provide for different grades of certificates, according to the qualifications of the applicants, would tend to place the question of salaries on a fair and even basis—as it is today we find good men receiving far too low wages, while others, whose work really does not entitle them to it, receive quite high wages. There would be something for the ambitious man to strive for and the one in the small plant would have a better show, than he has today—by and by the good positions would naturally go to the men with the first-class license.

The main object sought with a license or certificate law, however, should be protection; protection to the public, who is to eat the butter; protection to the farmers and creameries, who, to a large extent, are depending on the buttermaker for the profits of their labor and investment; and protection to the buttermaker who spends some of his best years in learning the trade, afterwards working hard not only to hold down his position, but to attain still more proficiency. The doctors' profession, the lawyers' and the teachers' require a license in some form or another for the protection of both the public and the men engaged in these occupations, and I do not see, why the buttermakers should be left to struggle along without the help that a license law would mean to the competent man. All our dairy states are employing eminent men to conduct experiments along dairy lines and are spending large sums of money educating young men in the profession of buttermaking—the policy of turning them out without any protection whatever to fight their own battle against oftentimes great odds seems to me rather inconsequent and illogical. If we want to attract the best element

among young men to take up the profession of buttermaking we are bound to offer them the best possible conditions, and if a license law would be a help toward this, it would be well for the industry to carefully consider this question.

I believe that most live buttermakers are in favor of a license law, but before the creamery men of any state take up this issue, they should first of all assure themselves that they will be able to get the right kind of men to supervise and enforce such a law. It is of utmost importance that the authority, who was to issue the license, should itself be qualified to this work with competence and integrity—in fact, the whole proposition stands and falls with the manner in which it is carried out—a license that anybody can obtain by paying a certain fee is worse than no license at all.

The advocates of a buttermaker's license law, rightly carried out, strongly believe that it would do much to raise the quality of the butter, and if you buttermakers of Wisconsin should see fit to take up this question and be able to have such a law passed by your legislature and afterward capture the prize banner at the next national convention, I trust some buttermaker from Minnesota will be the first to propose three cheers for Wisconsin.

THE BOILER INJECTOR.

BY G. H. BENKENDORF, WIS. DAIRY SCHOOL.

If there was to be a phonographic exhibition in this beautiful city this evening, I venture to state that not one-half dozen of this audience would attend. Yet, if such an exhibition had been announced twenty-five years ago there would not have been a hall in Waukesha large enough to hold the people desiring to see the great piece of mechanism and listen to its metallic sounds.

Few of us that daily have the handling of the modern cream separators stop to realize with what awe it even now, common as these machines are, inspires many people as they see the milk enter the machine and come out in a few seconds, as it were, separated more perfectly than it would be possible under any other system.

We step into our boiler-room and with a glance at the glass notice that the water is getting low. A few steps bring us to a very simple mechanism—two or three valves to open and it will be in operation. When it has performed its duty we close a few valves and leave it, probably never thinking for a moment of the great commotion its introduction caused just about forty or forty-five years ago. Everybody of scientific turn of mind or anyone that had anything to do with boilers was discussing the queer notion of a Frenchman to take steam out of a boiler and run it through a small contrivance and have it force itself with a lot of extra water, back into the boiler against its own pressure. The announcement of this invention created great astonishment and was considered by many people as the final step towards perpetual motion. As a whole it appeared as ridiculous to them as if a person would claim that he could take a dollar out of his pocket, and then put it back again and find that it had increased to a dollar and a half. Even after it was proven, that the injector was capable of doing that which was claimed for it, it was argued by many that it was a fraud. One party even took the trouble to write a book proving to a mathematical certainty that it was an utter impossibility for anyone to get up such a device.

To Henry Gifford belongs the honor of having invented the injector, utilizing in an ingenious way the latent power of a discharging jet of steam. It had for sometime previous been held entirely within the range of possibilities to make such an apparatus; but the great difficulty was in the getting of the proper conditions by a proper construction of the tubes and chambers, and we must give Gifford great credit, for few inventions have

been so thoroughly worked out, before giving them to the public as this one. His first model was a perfect success. Of course some great improvements have been made from time to time, especially in regard to their range of efficiency and the method of manipulating, but the salient features—the nozzle, the combining tube, and the delivery tube, practically remain the same.

Stratton, in his work on locomotives, says, "It was a common thing to see an engine with tracks greased and tender braked to revolve, in order to fill its boiler with water." From this we can see why for locomotive service the injector met with considerable favor, but for stationary boilers it at first was not popular. The general mystery that seemed to surround its workings, the belief that its wearing ability was poor, all tended to discourage general introduction. Yet it has overcome all these obstacles by its sheer strength of merit and is now considered the simplest and most satisfactory way of feeding a boiler so far devised.

We may think it strange nowadays that this invention was not received with open arms, but we must remember that people as a whole are very conservative and not easily led astray by what they term "strange gods." There is scarcely a great truth or doctrine but has had to fight its way to public recognition, in the face of detraction, calumny and persecution. Nearly every great discovery or invention that has blessed mankind has had to fight its way to recognition, even against the opposition of the most progressive men.

It indeed seems very strange, common as injectors are at the present time, that the working principle is not understood by very many—even among those who have the handling of them from day to day. Probably the simplest method of considering the subject is to eliminate the theory as far as possible and consider it from a mechanical point of view—simply as an apparatus in which the momentum of a jet of steam is transferred to a more slowly moving body of water, producing resultant velocity sufficient to overcome the pressure of the boiler.

Suppose steam under 120 pounds pressure delivers one pound steam per minute at its minimum diameter of the nozzle, it will have a velocity of about 1,400 feet per second or over one-fourth of a mile. But when we further augment the velocity by producing a vacuum in the combining tube, we sometimes increase the velocity to one-half or even two-thirds of a mile per second.

As this steam rushes forward it is condensed in the combining tube and it is then a solid stream of water only about 1-774 area of cross section while passing through the steam nozzle but still retaining its high velocity.

A jet of water coming out of the delivery tube under the same boiler pressure would have a velocity of about 133 feet per second or just about 1-25 of that of the condensed jet of steam. From the preceding it can plainly be seen that the condensed jet of steam has no difficulty in overcoming the stream of water constantly trying to come out of the boiler.

As the purpose of the injector is to feed water into the boiler we must necessarily add some water to this jet using the water first to keep the tubes cool and then adding it to the jet of condensed steam, which combines and moves along at a decreased rate of speed, but still swift enough to overcome the boiler pressure.

Should, for some reason or other, water be fed too fast, it can be readily seen that the jet of combined steam and water will be retarded to such an extent that it cannot overcome boiler pressure. Or if not sufficient water be fed the condensation will be imperfect and the volume of steam will not be reduced sufficiently to pass through the tubes. In either case, it is very clear, the injector will not work properly.

Let us briefly notice the different parts of an injector, namely the nozzle, the combining tube and the delivery tube. As has been shown, it is very desirable to obtain as high a velocity of the steam as possible, and it is with this end in view that we have the nozzle. Many shapes were at first devised, and acting on the principle that we give liquids more velocity when the nozzle is

convergent, the first were therefore so made. It was not until about 1869 or 1870 that the form was improved by making them divergent, thereby permitting expansion of the steam within the limits of the tube, which has the effect of increasing the volume and expansion in the direction of the flow of the particles of the fluid.

We next come to the combining tube which unfortunately is not perfectly understood, and hence each manufacturer will have his peculiar style of tube. They must all, however, conform to the following two requisites:

1st. That the water must be sustained during the impact of the steam.

2d. That the mixture of the steam and water must be as intimate as possible to allow perfect condensation.

Hence, to obtain these results it is necessary to have the tube converging to conform to the shape the jet would assume during condensation. It is this tube that differentiates the injector from similar apparatus, for it is within its walls that the process of condensation occurs. On account of this condensation caused by the mixture of the steam and the water, the vacuum is formed and it is this vacuum that causes the suction of the injector. From the foregoing we can plainly perceive that the combining tube is the really essential part of the injector. The part around which all other parts are built.

The delivery tube or third part of the injector is that tube in which the greatest velocity of the combined mixture of steam and water is obtained. This great velocity is subsequently reduced by expanding curves and diverging shape to the pressure and velocity in the boiler pipe.

It is the usual custom for manufacturers to indicate the size of their injectors by the smallest diameter of this tube as the amount of water delivered to the boiler is chiefly dependent upon its dimension.

These three parts are essentially necessary. We cannot conceive an injector without a nozzle, or having a nozzle and not having a combining tube.

Between the combining tube and the delivery tube is a small opening, varying in shape and size to suit the notions and whims of different manufacturers, for the purpose of allowing any surplus water that cannot go through the delivery tube to escape through the overflow.

Here let me drop just a few words on the difference between an inspirator and an injector. They are essentially the same, only an injector has just a single set of tubes to do the lifting and forcing into the boiler while an inspirator has two sets. The first set to do nothing but lifting and giving it to the second set which forces it into the boiler. The great advantage of an inspirator over an ordinary injector consists of its ability to perform duty under varying steam pressure, adapting itself automatically without the attention of the operator. As the steam pressure increases the first set of tubes will be able to raise more water to give to the second set which, on account of the increased pressure, can deliver more water to the boiler. But suppose the steam pressure decreases, the first set of tubes is unable to elevate as much water, but on the other hand the second set does not require an equal amount as it has not the steam pressure to deliver as before. From this we can readily see that in this style of injector the tubes must be built proportionately. That this style of injector is very satisfactory is evidenced by the great popularity which it enjoys.

As to the different injectors in use their name is legion and each manufacturer will claim points of merit over his competitors, and it is not the purpose of this paper to extol any particular make. If an injector is put up properly and operated according to the instructions sent with it, the chances are that it will work properly. I have noticed that operators become attached to some particular make and will positively claim that their style is all right and a good injector, etc., until they commence to have trouble with it and then, of course, it is the injector's fault, that it is a poor make, etc.; the next time they buy one it will be of another kind.

Now as to the reasons why injectors fail to work, we cannot commence to go into detail. Probably by far the most frequent cause is a leak in the suction pipe. This may be at the injector or some elbow, or as frequently happens, some stuffing box on some valve needs packing. As we explained before, the condensation of the steam in the combining tube causes a vacuum to be formed which in turn causes a suction, hence it is very evident that we must have all leaks stopped to maintain a good suction. We would not expect a suction pump to do good work with many air holes to contend with. It also follows from this that the longer the lift the more careful we must be in regard to this matter.

Another very frequent cause of trouble is where the feed water enters the boiler through the blow-off. During the night this pipe sometimes clogs up with dirt and scale and necessitates blowing off some water in order to clean the pipe before the injector will work properly; but if this will cause an operator to blow off some water out of his boiler each day, it may be regarded as a blessing in disguise.

Should your water contain lime the deposit of a hard scale upon the interior surfaces of the tubes and in the overflow vents is apt to be a source of trouble. This lime can in most cases be removed by allowing the tubes to remain over night in a solution of one part muriatic acid to ten parts of water. If this acid is not at hand strong vinegar will answer the purpose very well. As to using a strong solution of boiler compound I should say that that would depend upon the particular compound to be used. I have no doubt but that some compound would answer the purpose very well. On the contrary I believe some compound would be positively injurious to the tubes. Hence on general principles I do not recommend boiler compound for this purpose, especially since muriatic acid or vinegar are so easily obtainable.

The old adage—"What is worth doing at all, is worth doing well," applies with particular force in putting in an injector.

Good work put in here is time well spent and will surely pay big interest in saving lots of worry and time in locating causes of failure to work.

Every effort should be made to secure as dry steam as possible, connecting the steam pipe directly from the dome and should be of ample size so that the pressure will be as constant as the boiler pressure. It should be covered and have a pet cock to drain off accumulated water before starting. This pipe should be for the injector alone and not have branches to other parts of the building to be used for other purposes.

When an injector is required to lift the water, the chief object is to obtain a position as near the water level as possible without sacrificing any convenience of handling. It is self evident that the suction pipe should be as short and direct, thereby avoiding undue friction in the pipes and lessening the chances of leakage. If it should be of any considerable length it will be found to be of advantage to have it a size larger than the nipple at the injector. At the end of this suction pipe there should be a strainer of fine wire. A good many make the mistake and get this strainer too small; it should be of ample size; have it at least four times the area of the pipe.

Before using any pipe to connect up an injector it is a very good plan to blow them out carefully with steam so as to remove any dirt or scale that may be in the pipe.

We in America are not so particular with this kind of work as our British brethren are. They, instead of using elbows, substitute pipe with easy curves and thereby lessen the friction to a great extent. In coupling up an injector it is always good policy to have the pipes so made that the unions will fit squarely in their seats so that no force is required when screwing up the coupling nut.

In conclusion let me say that if we want to avoid trouble with our injector let us connect it up properly and take good care of it. Remember that if the injector does not work, it is usually our fault. The injector will do its work properly if given the

proper conditions. This is the duty we owe our injector, and as much as we neglect our duty in this respect, just so much are we going to have trouble.

CREAMERY REFRIGERATION.

BY H. S. BELL, OF WALWORTH.

As proper acidity and several chemical conditions of cream conducive to the manufacture of perfect butter are produced by proper refrigeration, this is unquestionably one of the most important necessities of the creamery plant.

The time has long since arrived when the sale of butter must be made on its merits and the surrounding circumstances and conditions must be such as will warrant the manufacture of a product of the highest standard, and the up-to-date buttermaker will accept nothing in the matter of refrigeration which will not warrant him in achieving this point of perfection.

From the time the milk enters the separator until the golden product is on its way to the consumer does the buttermaker eagerly watch the temperature of the material of which it is made and the system of refrigeration which will produce the desired results and which is at all times under perfect control with the least expenditure of time and monetary expense is the one he will apply.

I will not occupy your time on the subject of ice refrigeration as the advantages and disadvantages of this system have long been known and debated upon, but will bring your attention at once to the artificial or ammonia system. The ammonia system consists of a compressor operated directly from the engine of the creamery which forces ammonia in a liquid state through a system of pipes supplied at proper places with valves through which it is forced in such a manner that it expands or is converted into a gas which produces a temperature opposite to

that of steam to such an extent that the pipes when charged are constantly covered with frost and the temperature of a properly constructed refrigerator can be easily brought to a freezing point or much lower if desired.

The gas in the pipes is passed through a set of coils submerged in cold water by which it is condensed to a liquid form when it is pumped back by the compressor to repeat its journey as before.

Passing from this detail we will take up the system in a more general form. For a creamery from fifteen to thirty thousand pounds of milk per day use a No. 2 four-ton compressor. The creamery room should be well insulated, not less than two spaces filled with mineral wool or pulverized cork—three spaces would be better. Use large twin cream vats and place about four coils on each side of the pans, each pan being furnished with proper valve making each vat a complete system of its own. By this means with the proper stirring of the cream it is always under perfect control.

The refrigerator should be sufficiently large to hold at least one week's product, thoroughly insulated and supplied with galvanized iron pan large enough to hold not less than three hundred feet of coiled pipe and four or five barrels of brine. This should be placed in the upper part of the refrigerator leaving the lower part for storage. The ammonia passing through the submerged coils causes the temperature of the brine to lower to the freezing point or below without causing it to congeal as would water. This produces a cold, dry atmosphere which is much better than the damp cold produced by ice. Butter tubs come out dry and unstained. Being operated direct from the engine of the creamery while in operation makes the expense very small, and while the results obtained are almost miraculous, the manner of operating the system is so simple that a person of ordinary mechanical ingenuity can easily comprehend, operate and produce the desired results.

THE INSIDE AND THE OUTSIDE OF WISCONSIN CREAMERIES.

BY J. G. MOORE, OF ALBION.

Our secretary has given me as a subject the inside and outside of Wisconsin creameries, but as it is the outside that first attracts our attention, we will discuss that part first. It is said that it is hard to get away from first impressions, and while I do not believe that clothes make the man nor the outside of the creamery the butter, yet one cannot help but believe that they have an influence. How much better opinion of the inside we will have, if, as we approach the outside, we see the building nicely painted and a sign on it announcing to the passers-by the name of the concern carrying on the business within.

With nicely graded and graveled approaches, with a little green grass nicely trimmed and a few flowers in bloom, by the way, I stole that idea from our friend Mr. Kolarik, of Chicago Produce.

Any buttermaker who desires to raise a crop of pansies and forget-me-nots in the front yard of his creamery is requested to write to Joe Kolarik, care Chicago Dairy Produce. Mr. Kolarik, after years of patient study and research, has found a pansy and forget-me-not that will flourish amid coal ashes, sawdust, wagon tracks and tin cans. It will be well to write Mr. Kolarik early, as it is about time for him to have flowers-in-the-front-yard fence, and he will wait on you much more readily now than after the weather gets warm.

Suitable platforms where the loading and unloading of the milk could be done so that any milk spilt could be cleaned away, how much better it would impress one indeed than so many creameries that we do see that look as if they had never been painted, and that the only grading ever done around them is accomplished by the throwing out of the ashes or the cast-off rubbish that seem to accumulate around creameries of this kind.

Where the places where milk is loaded up is generally a mud-hole from the milk spilt or the water used to wash out the weigher and the smells arising from which, tell us as loud as any sign could do, the business carried on within.

However, I am glad to say that of the 175 creameries that I have had the pleasure of visiting, this latter kind has been in the minority, as I think people are beginning to awaken to the need of better sanitary surroundings.

The creamery instructors and inspectors should be clothed with such authority as would be necessary to enable them to order defects of this kind remedied. The inside of creameries are as varied as are the creameries themselves. No two apparently, although following the same general idea, being alike. There seems to be a general leaning towards cement floors in preference to those of wood, and I believe if properly laid they are much to be preferred, because the wood floors do not last very long and they are usually in a bad condition for some time before they are replaced. It has been said by someone "that the main door into a creamery should be into the boiler room," as it is the boiler that is the first thing one should examine and the last also before leaving the factory for the day. To illustrate: I visited a factory not long since, a gathered cream one, and running every other day, the buttermaker had been away on the day before and the owner of the creamery, knowing but little about the care of a boiler, had on arriving at the creamery, opened the bottom valve of the water-glass, thus allowing the water to be forced up and fill the glass. He supposing the boiler was full, made up the fire and got up steam, the buttermaker not arriving until late, and being informed that the boiler was full of water did not go out to see. When I arrived they were busy getting the cream into the churn and while waiting for a chance to talk to them I wandered out to the boiler room and of course looked to see where the water and steam was. I thought at first that I was deceived, but on trying the valves, discovered that there was no water there. Calling their attention to

this, they had to bank the fire and get steam down before they could get any water in. Of course if the buttermaker had to make his way into the building to the boiler room, he probably would have discovered the condition of affairs and remedied it. As it was, had someone not arrived and called their attention to it some injury might have been done to the boiler. In the setting of boilers, there seems a general tendency to get them too low, even below the level of the floor, and instead of a brick or cement floor in front that a man could keep swept clean and neat, oftentimes nothing but the dirt floor is left and one cannot but track dirt over the factory. Provision should be made so that the waste water from injectors and pumps could run off and so help to keep the boiler room tidy. If you have an iron smoke-stack do not be afraid to get up and give it a good threshing with a stick, so as to loosen the soot that will gather and sometimes catch on fire, and in some cases no doubt the unexplainable cause of creamery fires could be traced to this one thing. It gives one pleasure to go into a good creamery where there is room enough for the machinery and the propr performance of the work. Too many are so small and crowded that one has to work half as hard again as should be necessary, and in some creameries visited it would seem to be the intention of whoever fitted them up to make it as unhandy as possible. For instance, at a factory I visited last summer, the separator was just as far away from the milk vat as it could be well placed, and the consequences were that the long length of pipe from the pump to the separator was not kept as clean as it should, and as it could have been if the separator had been properly placed close to the vat. Not too close, but so that one can get around the machine nicely to clean. I have seen some separators that after years of use looked almost as bright as when they first came from the shop, while others evidently had had no care taken of them and looked as if they had been made of grease.

Had we the same laws enforced in this state as Minnesota has

where they can fine a buttermaker for having dirty pumps and pipes, I would have had the unpleasant duty of marching some of the boys before a justice and relieving them of some of their hard earned wealth. It is too bad that some of the boys do not seem to realize that they are handling an article of food and that the perishable nature of the material they are handling requires the greatest of care and constant watchfulness. I do not forget the time when the president of a large butter concern came to my factory and after looking around, asked me if I would unscrew the pipe that led from the pump to the end of the vat, with the promptness born of a conviction that my methods of cleaning were all right, I told him I would and hastened to comply. Imagine my mortification, when he poked his fingers in the elbow to see him bring it out with some of that yellow stuff on it. I can assure you that I would just as soon have been somewhere else, and I can imagine that some of the boys felt the same way when I have shown to them how their pipes and pumps were not as clean as they should be, nor are the gates to the vats always in as good a condition as they should be. Churns, whether box or combined, are usually kept clean, although in some instances a decided improvement could be made by practicing steaming the churn after washing with hot water. The heating of the milk before separating is of more importance than a good many think. In most cases you will find that direct steam is used and the milk being confined, there is no escape for the odors that may be and generally are in the milk. One of the latest style milk heaters where the surface of the milk is agitated and exposed so that the odors present can escape with arising steam is much to be preferred, and one creameryman told me only last week that he thought he was making a better grade of butter this winter by its use than he had been able to previous seasons by other methods.

Another thing that strikes me of great importance, not only to the looks of the creamery but to the health of the operator, is the subject of ventilation, especially is this need in evidence

in the winter when you see the walls and ceilings of some creameries covered with drops of moisture. It would seem to me that a number of chutes leading from the ceiling to a height at least with the level with the roof, with a slide on the ceiling to shut off the draft when necessary. These might all run into one central shaft. At one creamery in Walworth county which I visited, two or three such chutes with large umbrella-like openings in the ceiling leading into a central chute, had just been put in. If it wouldn't work otherwise the buttermaker was intending to put in a fan in the central chute to cause an upward draft.

The refrigerator is another very important part of the creamery, that has in a great many cases, received very little attention. Any old box that could be shut up and where some provision could be made for the ice to lay on was considered sufficient, but a great many losses on butter could be traced to poor refrigeration; also a great deal of the agitation about mold would be unnecessary if good refrigeration was provided. I do not think it is necessary that a good refrigerator should be so expensive as to preclude its use by any creamery. Any carpenter ought to be able to furnish with proper plans to build one, where a circulation of air will be had, thus carrying the dampness up and depositing it on the ice, keeping your box dry and avoiding mold on the tubs; also saving in the use of ice, the getting at of which, forms one of the hardest jobs around a creamery.

In testing milk, care should begin at the weigh-can to see that the samples are properly taken and cared for. A good many operators so read the test that the per cent. of over-run is carried so high as to be absurd. Some places that I have visited figuring up from 25 to 30 per cent. I got a letter from one creamery-man, wanting to know if there was any law to compel his neighbors to show up their books as he knew the test was being manipulated to his detriment.

One thing observable in a good many factories is an alkali test. However, I am unable to state how much good it does

some of them as in many cases it is possibly kept as an ornament. I believe, however, that the alkali test should be used, if not daily, then more frequently than is generally the case.

A good commercial starter, properly used is an aid to good work that is frequently overlooked, and if used would help many a buttermaker out of a peck of trouble. I deem it no breach of confidence to say, that the butter in the six month's contest shows that of those who entered in this year that were in last year's contest 80 per cent. of them scored perfect in workmanship, in the test of this year, and that of those in last year's contest 75 per cent. are in this. I would like to say to those buttermakers who are not yet in the contest that there is still time, and that I think they will be amply repaid by doing so.

Mr. B. D. White, of Minnesota, the expert in the six months' contest, in every case where the entry blank showed that the buttermaker was not using an alkali test or a starter he advised their use, and I see by this week's Produce that Mr. Leighton says, that the three highest scoring tubs at the Aberdeen, S. D. butter exhibit last week contained a commercial starter, and that an alkali test was used. Thus eliminating a good deal of guess work. In line with this thought I would like to say that I find a good many buttermakers who do not read a paper of any kind and who believe they can get along without attending conventions of this kind. I ran across a buttermaker of this kind not long ago who has been in the business for about fifteen years and never attended a convention, never saw a combined churn, nor reads any dairy paper. His wages have been going backward until now he only receives \$45.

THE RELATION OF MILK-SUGAR AND CASEIN TO BUTTERMAKING.

BY F. G. SHORT, OF FORT ATKINSON.

For the most part a buttermaker's work and observation are connected with but one part of the ingredients of milk, that is the butter fat. As he is engaged in separating, ripening, churning and in all ways working with fat, it occupies by far the greater part of his attention to the exclusion of the other ingredients of the milk, although the latter may have a powerful and perhaps unsuspected influence on his works and its results. To the buttermaker the fat is everything and he watches carefully the conditions of time and temperature which enter into its separation, ripening, and churning to the finished butter, and he does not consider the other ingredients to any marked degree, simply because the chemical changes which occur are hidden under the masque of white which hides from his eyes their action.

For the purpose of this paper, milk may be divided into four parts, thus, fat, milk-sugar, casein and albumen and it is of these last three, in their relation to the buttermaker's work that I wish to speak particularly of, for they have a decided influence on the quality as well as the quantity of the butter produced.

Let us therefore consider first milk sugar. This body is present in milk to the extent, on an average, of 5 per cent. As it is colorless and of but small sweetening power it is noticeable only by the changes that occur under the action of the various forms of bacteria and the consequent effect of other bodies on the quality and amount of butter.

To give you a practical idea of milk sugar I have here a sample as it is formed from whey that has been boiled down until it is sufficiently concentrated to allow the sugar to crystallize out. This crystallized milk sugar is hard, but slightly

sweet, in comparison with common sugar and much less soluble in water when this sugar is taken into the mouth there is a kind of sandy feeling, owing to its hardness and the slowness with which it dissolves. This form of the sugar has but little interest for the buttermaker, but in solution as it is found in milk it is of interest, as it may be either a friend or enemy, according as it is changed by bacteria.

Before however, we take up the bacterial side of milk sugar there is one point that is interesting and may be considered because it is the cause of part of the changes which take place in the use of the Babcock test and is consequently familiar to all buttermakers. This is the action of strong acid on milk sugar; when sulphuric acid in small amount is mixed either with milk or a solution of milk sugar, no visible action takes place, but if we increase the amount of acid we notice two changes in the solution; first the mixture of acid and water grows warm and if the amount of acid is increased grows hotter, until with further addition of acid it may reach to nearly the boiling point of water.

But the most striking change is the action of the acid on the milk sugar. First a red brown appears which grows darker as more acid is added until by the destruction of the milk sugar the liquid becomes almost black, owing to the formation of charcoal like compounds, and if more acid is added there is an actual separation of charcoal which floats in light flocks in the heavy acid liquid.

This is the result of the decomposition of milk sugar by strong acids and is the only one which is of interest to the buttermaker. The others are less violent but of more practical interest from the creamery standpoint.

The interesting question to the buttermaker is how the milk sugar is acted on by bacteria and what class of compounds may be expected and further how he may prevent such bacteria from getting into and acting on the milk. Naturally the most common as well as the most important class of bacteria are those

that form lactic acid, but without any attempt to describe what these are I will call attention to the acid which they produce from milk sugar and show you some of its properties.

Now lactic acid is known to the buttermaker only by taste and smell; owing to its being colorless and not forming crystals, it does not separate from sour milk or whey and rapidly changes under the action of bacteria into compounds having other properties than the original acid. Here is a sample of lactic acid, you see it is a colorless thick liquid with the same smell and taste as that found in milk. It dissolves in water, and unlike milk sugar does not turn brown when mixed with strong sulphuric acid.

You are all familiar with the Farrington test for acidity of milk. Now we will put some of this acid in water and add some of the Farrington solution and you will see that the color comes in just the same way as if milk was being tested. Thus the presence of this small amount of lactic acid in cream is of decided importance to the buttermaker, and how important it may be easily seen if we consider the physical properties of cream and the changes that occur in it.

Cream is known as an emulsion, that is a mixture of finely divided fat held in suspension by a solution of casein. It is of the same nature as the mixture of soap solution and kerosene which is used for killing insects. It is a property of all emulsions, cream included, that they must be alkaline or neutral, that is, most not be acid, if they are to remain permanent. In the case of cream the formation of lactic acid immediately throws down the casein and to a certain extent destroys the emulsion. The result is that the cream loses its smooth soapy nature becomes granula, thick and the casein no longer keeps the fat globules apart; they come together under the action of churning and the small granules of butter are the result.

This is the action of lactic acid on the cream when the normal ripening of milk occurs; we can illustrate it in a rough manner with a little dilute lactic acid and this solution of casein in

caustic soda. You see that this solution is soapy, viscid, gummy; it foams when shaken in the jar and if we could add some melted butter fat and shake the mixture violently we should have in a rough way an illustration of the way in which the fat is held in suspension in milk by the casin. The particles of fat in such an emulsion would be many times larger than the fat globules in milk but the theory of their formation would be the same.

Now on the addition of the dilute acid the same change takes place as when the lactic acid bacteria form acid in milk, only in this case the casein comes down in fine clots in place of the semi-solid mass that is formed in milk, and as a consequence all the soapiness and tendency to foam has disappeared and we have a mixture of fat and precipitated casin from which if the temperature is correct a rough imitation of butter could be churned out.

This is the condition which is found in cream when the acid forming bacteria have been allowed to grow in the normal manner and the usual amount of acid 0.4 to 0.6 per cent. has been produced. Now, unfortunately for the butter maker, instead of the acid bacteria, other species frequently get the upper hand and then we have an entirely new condition of things in the cream tank and an equally perplexing outcome for the buttermaker.

In such cases, the milk sugar is the body that provides food for the bacteria, and each variety of germ works over the milk sugar and produces a compound peculiar to itself. One of the most common of these products is that which causes ropy milk which often occurs during the warm milk and is a source of considerable trouble, especially in private dairies. In this condition, the viscosity of the milk is so changed that it may be drawn out in long threads and in extreme cases those threads may be stretched out several feet in length.

It is evident that in such cases, the ropy condition of the milk is a decided bar to the operation of creaming and such a

condition would at once call for a general overhauling because the results are so evident. But between the extreme ropy condition and a normal acid condition, there is a long series of fermentations, some slightly viscous or ropy, others with no trace of ropiness but producing alkaline bodies that effect the churnability of the cream to a greater or less degree.

Some of these ferments are neutral, in so far as their results on the flavor or quality of the butter is concerned. Others may produce a more or less decided flavor, which in some cases may nearly approach the true butter flavor, and thus do not indicate to the butter maker that there is anything wrong with his cream, and in consequence unless constant supervision is kept over the cream with the Farrington acid test and the butter-milk with the Babcock test, there is a large liability of a decided loss of butter fat.

Before taking up the action of bacteria on casein, let us consider some of the physical properties of casein as found in milk when separated. You all know the change that occurs in milk when acid is added to it, but a practical illustration will do no harm. (Add lactic acid to solution of casein in Babcock bottle.) Notice at first that the casein is thrown down in clots, now on adding more acid, that casein begins to dissolve, and on adding still more acid, the casein goes into solution and we have a clear liquid. You will observe that unlike the case when the acid is added to the milk that there is no blackening, or very slightly, of the acid liquid, which shows the absence of milk sugar. We thus have as the first proposition that casein is soluble in strong acid.

Now let us add to some casein that has been soaked in water, but as you will notice, not dissolved, some dilute soda solution and you will see from the immediate change in the looks of the liquid that the casein is being dissolved and also on shaking the solution that it forms easily and is of a soapy nature or viscous as it is called. Bearing these facts in mind, it will enable us to understand the manner in which casein acts in milk and

cream and also its action in aiding as well as hindering the separation of butter fat in the churn.

You remember that casein is partly in solution. Now in a solution of this kind, that is not acid, we have just the condition that will keep the fat globules apart and prevent them uniting that will keep the fat globules apart and prevent them uniting to form of butter. It is true that from average sweet milk a small amount comparatively, and the rest of the fat remains unchurned regardless of the time or temperature used. This condition will remain until we either remove a large part of the casein by making a very thick cream from the milk or else by charging the condition of the casein, so that the mixed emulsion of the fat and casein can separate.

As I showed you in the beginning, this change can be made by either adding dilute acid to the cream, or by allowing the lactic acid bacteria to change the milk sugar to lactic acid, and as this acid is formed very slowly and evenly through the mass of cream, the casein is thrown down in small clots and we have a mixture of finely divided fat and casein that offers no obstruction to the action of churning.

Albumen is so nearly allied to casein in its source and has such a decided influence on churning under certain conditions, that it may be of interest to consider a few of its properties. For our purpose, albumen may be represented by the white of an egg and the average milk contains about 0.50 or 1-2 per cent. of this body. This may seem a small amount and it is under the usual creaming conditions, but if one or two patrons who happen to have a few fresh cows, and have not the fear of the buttermaker before their eyes, should bring a hundred pounds of milk that leaned toward colostrum, it might have a decided influence on the churning.

Albumen is one of the most viscous or sticky bodies known when dissolved in water, and when added to cream it acts by forming a thin coating around each globule, and the coating is of such a resisting power that it prevents the butter globules

from uniting in the churn and from this condition arises many churning troubles of the buttermaker.

This is especially true when the combination of higher melting point of the butter fat and increase of albumen, such as is sometimes found in the milk of animals, in an advanced state of lactation.

Here we have the influence of the albumen added to that of a hard fat globule, which does not soften at the usual churning temperature and the result is, in private dairies, at least, a cream that it is frequently almost impossible to churn without some treatment, such as washing the churn to remove the albumen or churning at a decidedly higher temperature.

EVENING SESSION, FEBRUARY 25, 1903.

The convention was called to order by the President at 7:30 P. M. Ladies and gentlemen; we will go a little out of the usual order on the program this evening and the first will be an address by Prof. F. W. Woll, on Butter Contests in Foreign Countries.

FOREIGN BUTTER EXHIBITS.

PROF. F. W. WOLL, MADISON, WIS.

Those of you who keep informed as to the discussions going on in the dairy papers and at dairy conventions are aware that the subject of butter contests is a very live one in this country at the present time. The National Buttermakers' Association last year had a six months' contest in which over 300 buttermakers participated; another test has just been started for the current year with about 400 contestants, and in a number of the states where the manufacture of butter is an important industry state contests are now under consideration or in progress. Under

these conditions it is well for us to look beyond the confines of our own country and see whether any work in this line has ever been done elsewhere and if such is the case whether we cannot profit from the experiences there gained. This may, of course, save us from making mistakes and will help us onward along the right road. Experience is a good and safe teacher, but the lessons thus taught often come high and we are not apt to make very much progress during the three score and ten allotted to us if we have only our own experience to fall back on.

We find that butter contests have been held regularly in Denmark during the past dozen years or more; for a somewhat shorter time in Sweden and Finland, and also in a number of German provinces, notably Hanover, Schleswig-Holstein and Mecklenburg. The system has, however, been conducted on the largest scale and has been carried to the greatest perfection in Denmark and I shall devote nearly all my time to describing the work done there, both because the distinction is due to Denmark for the reason already stated and because I like to talk about what I am most familiar with. Here I met with one difficulty, however; during late years our dairymen and especially our buttermakers have constantly been referred to Denmark for advanced dairy knowledge. The idea is commonly expressed, at least among many of these writers, that if we only do as Denmark does we are all right and because a method or a piece of apparatus has been adopted in Denmark it must necessarily suit our conditions, and they do not hesitate to tell us so, in season and out of it. A natural result is a prejudice among many buttermakers against anything that comes from Denmark. As a well-known dairy scientist expressed it to me with considerable emphasis when I suggested that our buttermakers might be willing to get along without Denmark for a while now: "Yes, hang Denmark.;" or as the poet has it:

The famous cows of Denmark,
Are fed on Yankee grain;
We ship it o'er the ocean,
And back it comes again

In yellow balls of butter,
For England and the South,
To fill to overflowing
The market's yawning mouth.
We feed the cows of Denmark,
We help the Dane to churn;
We can't dis Dane our market
Though he disdanes our turn.
Have we no Yankee bossies
To eat our corn and bran?
Where is our four-legged partner?
Where is our dairyman?
Here's to the Yankee heifer,
Here's to the Yankee cow;
Bother the heards of Denmark
Stay with the home kine now.

You may see now one reason for the wording of the title of this talk of mine. And after these introductory remarks I shall proceed along the beaten path and tell you something about the wonderful ways of the Danes, confining my remarks, however, so far as I may, to the subject of the Danish butter exhibits. I need not tell you that Denmark is a small country, at about the same latitude as Labrador; on an area only about one-fourth of the state of Wisconsin are crowded a population of about 2,500,000 people. If spread evenly over the country there would not be much crowding, but a large portion of the peninsula Jutland supports only a small population and hence the arable and fertile parts of the country must give sustenance to so much a larger share of the people. Nearly half the population is agricultural and a goodly part of the other half lives from handling the products raised by the agricultural half. In 1864 a national calamity struck the country when Germany with all the right that might gives, and but little more, appropriated for her own use one of the most fertile and valuable anish provinces, Schleswig-Holstein. At an agricultural fair held in Copenhagen, I believe in 1870, a medal with this inscription was struck and sold: *Hvad udad tabes maa indad vindes*—What is lost to the outside must be gained from within, and that has been the motto of the leading men in Denmark ever since: the devel-

opment of the home resources to the highest extent so as to be overtaken by no foreign competitor in their march toward progress.

In this work natural conditions have favored them in several ways; the population is homogeneous and all of one nationality, cemented together more closely than in other foreign countries by a common language, by history, traditions and unity of interests, as well as by the baptism of national grief at their bereavement, and unanimity of feeling toward the common enemy of the south. The small extent of the country is also considerable of an advantage; if connections are right it will not take you more than a fraction of a day to reach any part of the country when you are once inside its borders. Other very important factors have been the wise leaders they have had in the development of their natural advantages, men who have been quick to take advantage of these by the advancement of science for the promotion of agriculture and related industries. Furthermore, a perfect official organization, from the Agricultural College, the Experiment Station and the Royal Agricultural Society to the agricultural and dairy traveling instructors. And last but not least, an intelligent class of farmers possessing a wholesome respect for authority, who have confidence in their teachers and are ever ready to work in harmony with them and to adopt suggestions that they are able to make. It requires but little reflection to discern the differences in conditions in Denmark and in this country, and to satisfy one's self that a system that has worked well under Danish conditions will not necessarily work well with us; on the other hand, the opposite is equally true that conditions are in many ways similar in the two countries and there can be no question but that we may often profitably learn from their experiences as they from ours.

The dairy industry of Denmark as a separate and distinct industry is hardly a generation old yet. Up to the seventies Denmark was essentially a grain-producing and grain-export-

ing country. About this time competition from this and other countries, recently opened up for settlement, brought prices for grain products down and down, and the values of agricultural land were as a result reduced until the Danish farmer was left the choice between running deeper into debt with every year or changing his system of farming, and the rate at which the dairy industry has been growing in that country shows that he has not been slow to change. Thirty years ago the net exports of butter were less than 10,000,000 pounds; last year they reached the magnificent figure of nearly 140,000,000 pounds, with a value of over \$40,000,000, or nearly double the total production of butter and cheese in the creameries or factories of our state. The following table gives the figures for the imports and exports of butter since 1865 in five-year periods up to 1899 and for each year after that. The average price paid per pound is also given.

Danish Imports and Exports of Butter (in million Danish pounds).

Year.	Imports.	Exports.	Net Exports.	Aver. value per lb.
1865-69	1.06	9.85	8.79	
1870-74	3.66	20.71	17.05	
1875-79	4.94	26.32	21.38	27.4
1880-84	6.91	29.14	22.23	27.0
1885-89	10.79	50.65	39.86	25.3
1890-94	25.27	97.48	72.21	25.1
1895-99	33.32	132.00	98.68	24.7
1900	42.37	153.10	110.73	25.8
1901	48.37	170.52	121.96	26.5
1902	49.22	170.94	130.72	25.7

At the present time over 90 per cent. of the total exports from Denmark consist of agricultural products, and 80 per cent. are butter, bacon and eggs. Confining our attention here especially to the butter industry we note that its wonderful growth is due to the development of the co-operative creamery system more than to any other factor, from the fact that about 4-5 of Danish creameries now in existence are co-operative, viz., 1057 out of a total of 1367. A few words concerning these may therefore be of interest. The first co-operative creamery

that was established and became of importance as a pattern to others was that of Hjedding in Jutland, organized in 1882. The co-operative creameries have steadily increased in number from that time on, while many of the proprietary creameries have gone under and many private estate dairies have been merged into co-operative creameries. The capital now invested in the co-operative creameries for buildings and apparatus is estimated at \$7,000,000 or nearly \$7,000 per creamery. The number of cows contributing to a creamery in the majority of cases varies between five and eight hundred, a few have less than 100 cows while some have 1,200 to 1,500 cows or still more.

For the sake of comparisons I will give corresponding figures for Wisconsin; according to the census of 1900 we had in this state 728 creameries manufacturing in all over 62,000,000 pounds of butter. This means an average annual production of less than 80,000 pounds. If we assume the average production of butter per cow per year at 200 pounds, which is more apt to be too high than too low, we find that the number of cows supplying milk to a Wisconsin creamery of average size is about 400, against 700 for a medium-sized Danish creamery. The capital invested in Wisconsin creameries is unfortunately not given in the census reports, as the data for both creameries and cheese factories together are only given. There were 2,018 creameries and cheese factories owning buildings, machinery, real estate, etc., worth nearly \$5,000,000 or about \$2,400 per factory against \$7,000 for Danish creameries. The figure for Wisconsin creameries is no doubt somewhat too low, because nearly 2-3 of the number of establishments included were cheese factories, the outfit of which as a general rule is considerably cheaper than that of creameries. Even if we increase the sum say by \$500 we still reach a figure which is less than one-half of that for the Danish creamery.

This fact is easily apparent to the traveler in Denmark who is familiar with conditions in our dairy sections. The creamery buildings are generally substantially built, good-sized brick or

stone structures, with living rooms for the manager and one or more helpers in one part of the building or a separate building is built for the latter. The value of the lot on which the creamery is built is considerable higher than that of a similar piece of property in our state and finally the equipment of the creamery is more expensive, including besides separators, milk and cream vats, boiler, engine, churn and butter worker, pasteurization apparatus and coolers for the cream and skim milk.

I may have drifted somewhat from the subject assigned to me by your Secretary and would certainly do so should I proceed to describe further the characteristics of Danish creameries or the methods in vogue there. I have thought, however, that some few facts like those given as to the origin and present conditions of these factories would be of interest and something of a pre-requisite for forming a correct idea of the Danish butter exhibits which we are to consider more in particular this evening.

The official agency that has contributed more than any other single agency to the development of the dairy industry of Denmark is the institution known as the Laboratory for Social-Economic Experiments of the Royal Veterinary and Agricultural College at Copenhagen or, in other words, of the Danish State Experiment Station, and the phase of its work which has been of most importance to the Danish butter industry is the butter exhibits conducted by the Experiment Station in co-operation with nearly all of Danish creameries. These exhibits or butter shows were started by that genius among dairy investigators, Prof. N. J. Fjord, in 1889. Since his death in 1891 they have been continued by the management of the Experiment Station, essentially as planned by Prof. Fjord. The object aimed at in establishing the butter exhibits was to secure co-operation between the dairies and creameries on the one hand, and the state dairy instructors, the butter dealers, and the experiment station on the other, so that problems connected with

the making of high-grade products could be studied from different points of view, and the creameries thus be helped over difficulties that would come up, and the quality of the butter produced gradually raised to the highest possible standard. Then there has also been another object in view with the exhibits, viz., to secure accurate statistical and other data concerning the water content of Danish butter, the loss of weight of butter on storage, effect of pasteurization on the composition of butter, the relation of flavor of butter to its quality, and its chemical composition, especially as regards the results of certain chemical methods of examinations, and many other questions of both practical and scientific importance. The managers of 319 creameries accepted the call to take part in the exhibits at the date set for filing applications, and when the first exhibit was held in November, 1889, the number had swelled to about 350 creameries. At the present time about 1,000 creameries take part in the exhibits out of a total of less than 1,400. These creameries are scattered in all parts of the country, on the islands and the mainland, and represent all the gradations of Danish creameries, in size, equipment, management, and other conditions.

The plan of the Danish system of butter exhibits is briefly as follows: When notified by the Experiment Station the creameries send a tub of their regular make to the Station, where the butter is stored in a building put up for this special purpose. Here the tubs are scored by expert judges a couple of days after they have been received, and again fourteen days later. During late years the butter has been scored only once, when about ten days old, which is as old as the butter generally is when it reaches the English consumer. The butter is scored independently by three different groups of judges, of four judges each, three butter dealers and one of the state dairy instructors. Each group of judges discuss and decide on the score to be given each tub of butter and the scores by the different groups for each exhibit are then averaged by the Experiment Station.

Prior to the scoring of the butter the tubs are covered up with a galvanized-iron jacket so that the top of the butter only is visible to the judges, and they have therefore no clue to the origin of the various tubs. The poorest grades are again gone over the following day by six of the judges, three butter dealers and three state dairy instructors, and the cause of the poor scores ascertained and discussed. The dairy instructors then look up the creameries in their respective districts furnishing this butter and make investigations which are continued until the trouble is located and remedied.

During the fourteen years that have passed since the exhibits were established the poorer grades of butter have as a natural result gradually disappeared until the quality of the butter now exhibited is wonderfully uniform. Two years ago when I visited Copenhagen the professor in charge of the exhibits took plugs of the butter scoring highest and of that scoring lowest among over 100 tubs in the room. The remarkably small difference in the quality of the two kinds was as much of a source of pride to him as a surprise to me. The poorest grade would have been considered very good butter in almost any market.

The special features of these Danish exhibits are, first, the thorough manner in which the scoring is done, and the great care taken in ascertaining the true quality of the butter, and second, the butter represents the regular every-day make of the creameries, as the managers are unaware when they will be called upon to exhibit. They are notified by telegraph or mail directly before the butter is to be shipped, and cannot therefore forward butter made for this special purpose. Great stress is laid on this point. As the creameries have certain shipping days the notification is always sent so as to reach them in the forenoon of these days or the preceding afternoon, and the exact time of shipping is checked up by the bill of lading.

The Station pays the regular market price for each tub received and when through with the butter, sells it for what it will bring. Naturally this entails a great loss of money, as the

quality of the butter will deteriorate during the two or three weeks while kept in storage. Other heavy expenses are fees for the judges, transportation and telegraph charges, stationary, etc.; the butter exhibits are therefore an expensive enterprise, costing the government about \$10,000 a year, but in view of the vast interests at stake and the improvement in the quality of the butter which has come largely through the enterprise it must be considered a gilt-edge investment.

As stated at the outset I shall speak mostly on the Danish butter exhibits and will add only a few remarks concerning similar enterprises in other countries. Next to Denmark, Sweden has developed the system of regular butter exhibits to its greatest perfection. The main differences between the exhibits in the two countries are first, that in Denmark the government defrays the total expenses connected with the exhibits, while in Sweden the government or county agricultural societies pay one-half and the other half is raised by a tax of 40 *kroner* (\$11.00) on each creamery taking part, and second, that the butter is scored independently by three groups of judges of three butter dealers and dairy instructors each, both these classes of experts being represented in each group. As to the former difference it may be said that the Danish system of having all expenses defrayed by the government is without a question preferable, for no matter how small a tax is assessed it will prevent some creameries from taking part in the exhibits, and it would be first of all those creameries that most need being checked up, who can therefore less afford to remain outside. As to the second difference it would seem that the Swedish system of judging the butter is amply able to secure an absolutely correct and fair score. The butter is scored independently by three different groups of judges who have no means of knowing where the butter came from; the score which each group hands in is averaged by the management and this average score is reported to the creamery. It represents therefore the best judgment of nine experts given without bias and regardless of anything but the

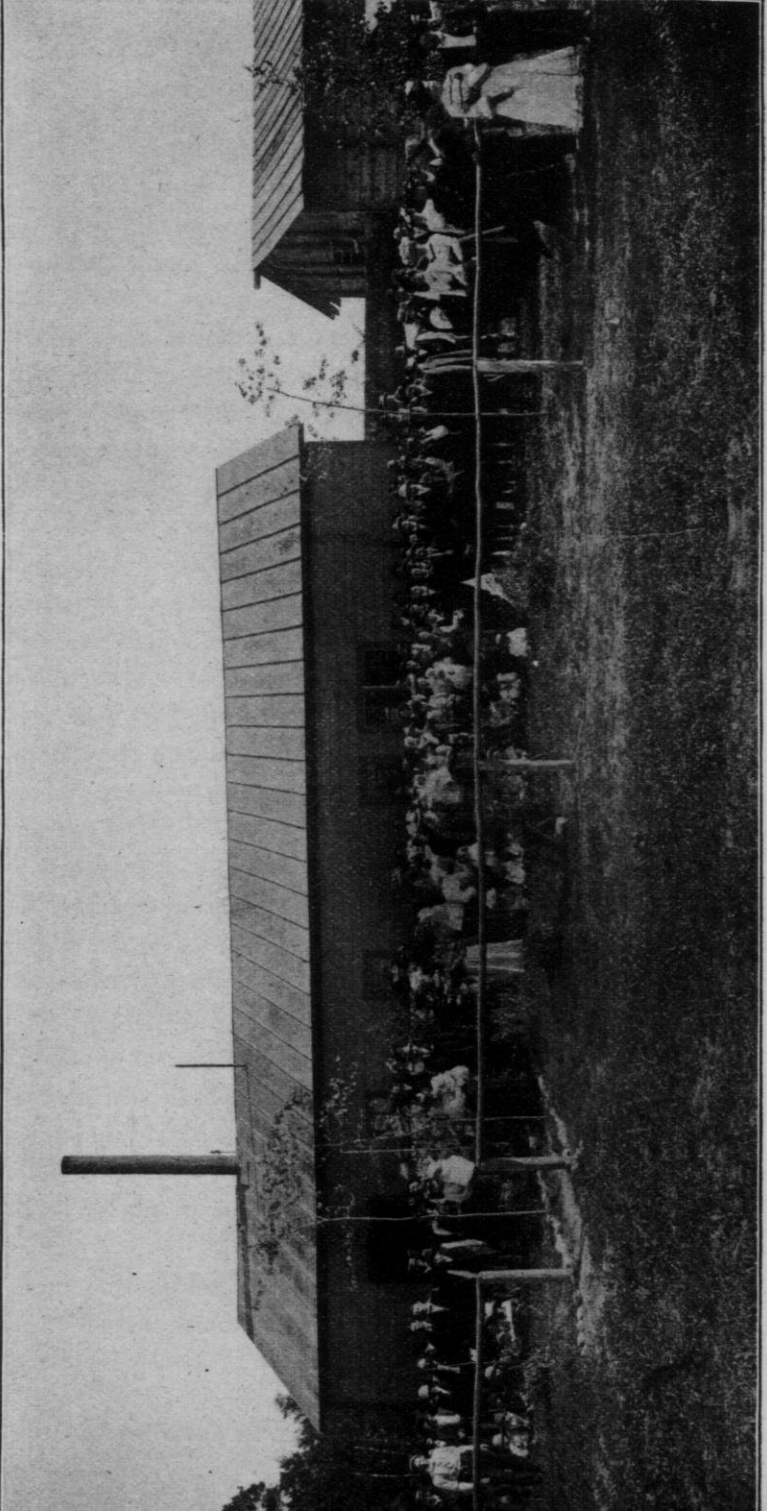
intrinsic value or quality of the butter as intended for the English market.

The practice of group system of judges has never, so far as I am aware, been introduced into American butter contests; there can be no doubt but that it would be a great step in advance over the one-judge system or even two or three judge system. It is no reflection on a man's character or ability as a judge of butter to say that the best of them cannot possibly score a hundred or even several hundred different lots of butter inside of a limited number of hours and do full justice to all. It is beyond the ability of human power. Butter judging is a fine art and after a number of butter packages have been scored the senses of smell and taste of even the best of judges will be less acute than when he takes up the work, hence he is then less able to distinguish small differences in quality and is as apt to place the second best butter first as the other way. This fact is brought out strongly in a paper on "Difficulties in the way of drawing conclusions from experiments in butter making when passed on one judge scores," by your Secretary in the last annual report of our Experiment Station which has just been published and I would recommend a study of this paper as well as of the methods of judging butter in the foreign countries which we have considered, to the careful consideration of those in charge of butter contests in this country.

The President: Ladies and Gentlemen: I am sure you will agree with me that the entertainment which I have been promising you today is about to take place. I would say to the ladies and gentlemen present, I am sure that you will all relish it; Mr. Jules Lombard, whom we all know and whom we all love, will favor us with a selection.

Mr. Jules Lombard: Of course we miss some familiar faces, especially such as our friend Ex-Governor Hoard, a gentleman whom we all know, you can not think of him without laughter, you cannot think of him without loving him.

Song by Jules Lombard.



A NEW CREAMERY IN NORTHERN WISCONSIN.

SUGGESTIONS FROM A BUTTER BUYER.

BY W. S. MOORE.

Ladies and Gentlemen: Dean Swift once went into a cheese monger's shop and asked for two pounds of his best cheese. The dealer cut off a slice of cheese and said to Swift, "Shall I wrap it up for you?" Swift sniffed at the cheese from where he stood and replied: "No, just give me a string and I will lead it home." In my experience I have found very little demand among consumers for the kind of butter that can be led home with a string. But on the other hand, it is impossible to supply the demand for the kind of butter which will win the sweepstakes here this week. The demand for butter is very fast setting upon a few kinds.

The consumer pays the highest price for fancy print butter for in fancy print he finds the nearest approach to his ideals of perfection in quality and style. But the style is of no avail if the quality is not there also. I consider it folly for any butter-maker whose average score is not 94 or better to attempt to make prints, for his butter will sell better in tubs.

Next to extreme quality the greatest and most persistent demand is for uniformity. It is the ability to make a large quantity of uniform quality that gives to centralizing plants one of their chief advantages. The day of poor creamery butter is past. It cannot compete in the market with "renovated butter." The name "renovated" sounds distasteful and has retarded the sale of this grade of butter, but it has caused it to be sold so cheaply that it is being popularized very much faster than it ever would have been under other conditions. There is a vast misconception, in the halls of congress, in the cities, and in the creameries, as to the nature of "renovated" butter.

You know full well that when farmers make butter at home they may not, in fact usually do not make it fine. The fault that keeps it from the consumers' table, and sends it fresh to

the renovator, usually is not one that affects the purity or healthfulness of the butter fat, but is one caused by the lack of skill on the part of the maker. It may be cheesy, or greasy, or badly motled, or over salted, or have any one of a thousand and one other faults, which make it unattractive, and yet contain the very best of butter fat. The renovator simply undoes what the farmer has done and tries to do it over again correctly.

He separates the pure butter fat from the casine, water and salt by melting, and re churns the fat in pure wholesome milk properly ripened.

You can view renovated butter from any standpoint you choose, and still you will have to admit that it has found a place in the market, and that place is the one formerly occupied by the undergrade creamery.

Thus we find three principal grades of butter on the market. First, strictly fancy print butter; second, fine uniform creamery butter in tubs, and lastly, renovated butter. If you can't get in to one of these classes, you are down and out, and it is to be hoped you will realize it before you have lost every thing.

There are three classes of faults in creamery butter. First, those that the butter maker can correct or reduce; second, those that can be corrected or reduced by the patrons only and are beyond the control of the buttermaker; lastly, those that can only be corrected by the buttermaker and patrons working together. It is not fair for the buttermaker to lay all the blame for poor quality at the patron's door until he has obtained a perfect score on body, salt, color and package and packing, and can make and does use every day a good home-made or commercial starter.

On the other hand, it is not fair for the patrons to lay all the blame on the buttermaker, so long as they have poor cows, feed poor or insufficient feed; keep their milk or cream in the barn or kitchen over night, or do not aeriate the milk when fresh drawn, or allow the milk to get sour or heated before it reaches the factory, or keep their cans closed tight on a hot day, or use dirty or unclean cans or utensils, or do innumerable other things that they know is not right.

If both sides will prepare to start the row by having their own part so well done that the other side can't get back at them when complaint is launched then there will be no ground for complaint, and the making of premium butter will be comparatively easy.

When faults are reported from the market too many butter-makers and creamery men get indignant, and immediately seek another outlet, where the fault will be overlooked or ignored. If some such men would spend one-half the energy in trying to correct the faults that they do in trying to get an ideal commission house, they would be fully satisfied with any one of the dozen or more houses they try in a single season.

My experience is that most commission men will do all in their power to move a lot of butter at full price before reporting the butter "off" in any way. And if they are successful the chances are that no report of the fault will be made, in the hopes that next week the fault will be corrected. The general rule among commission men is to "sell for all you can. Return all you dare and say nothing but praise." In other words, don't look for trouble.

When your commission man jeopardizes his business relations with you by complaining of the quality you can rest assured that it is serious and it will behoove you to "get busy" and find the fault. The present methods of marketing butter will not always be in vogue. Some day, and it is not far distant, some enterprising butter buyer will buy butter strictly according to score, paying a premium for every additional point above some fixed standard. Then the good buttermakers and the painstaking patrons will get their reward, and the poor buttermakers and the careless patrons will be paid according to their deserts. When that day comes dairying in the northwest will take a boom. Wisconsin should not be slow to prepare herself for the contest for supremacy. Neighboring states are organizing district conventions in addition to the state and national conventions, and these conventions are the most helpful of all the conventions.

The National Association is holding a six months' contest to which every buttermaker in Wisconsin should send a tub every time, for he not only gets a score but a brief and instructive criticism of his methods, besides the helpful rules printed on every score card.

Wisconsin should not forget that Minnesota has eight or nine instructors and inspectors in the field all the time helping her buttermakers on, and should urge the legislature to make similar provisions for her benefit if she does not desire to loose the prestige she has so long held.

As we journey along through life we will find many a panacea for both the financial and physical ills to which man has fallen heir. But there is no panacea! The remedy that fits one man's case is ridiculous when applied to another's. I cannot better illustrate this than by relating the incident of the Jew, who was going along the street with a frightful toothache. He mets his friend Ike who says: "Say, Jakey, what is the matter?" "O, I have such a toothache; such a toothache; such a toothache!!!" "My gracious man, you shouldn't have a toothache, I never have a toothache." "Say, Ikey, tell me what you do for a toothache." "Well, Jakey, when I get a toothache I go home and my wife puts her arms around my neck and kisses my face all over, and it makes me feel so happy that the toothache goes right away." "Say, Ikey, is your wife home now?"

The President: The next on the program is an address by A. E. Anderson, of Iowa, "A Traveling Man's Suggestions to Buttermakers."

ADDRESS BY A. E. ANDERSON.

Mr. President, Ladies and Gentlemen: I don't know whether it is worth while, whether it is best to break the spell that has fallen upon us by listening to the singing of this grand old man. 20 years ago I listened to the same melodious voice that has thrilled us here tonight; but I find that I am a little mixed here

tonight. Some two or three weeks ago I read in the papers down in Iowa that I was to address you on "What aid a traveling man might be to the buttermaker," then again I read in your paper that I was to address you on "What aid the traveling man might be to the buttermakers' association," when I arrived at your city today and sat down at the hotel dining table and took up the morning paper I found on the left hand side of the bill of fare a letter addressed to me, informing me that now I am required to address you on the subject of "A traveling man's suggestions to the buttermakers." Which one shall I take? I had written quite a nice little speech and brought it in my grip; it is there yet: "A traveling man's suggestions to the buttermakers of Wisconsin."

I hope you are all here tonight and more particularly the young buttermakers. I would like to suggest, in the first place I would suggest, that no man should enter this field unless he is prepared to follow the advice of the best buttermakers of the land. In the first place I would suggest that if you have any idea of entering the field, that you spend at least three years with a dairyman and learn how to feed cows, learn which cow is the best built cow, learn which cow produces the best milk, learn if you possibly can, which is the best food for milk cows. After you have spent at least two or perhaps three years on the farm, according to your ability to learn, then go and hire out as second man to the best buttermaker in your state. Now, then, this is not all; after that I would have you spend at least two years or three years at least in one of your dairy schools if it be in Wisconsin, at Madison.

Now, why do I suggest such a long course of training? It is simply this; I find that in the years that I have traveled throughout all the Western states that the men who are giving satisfaction, are the men who have made this a profession.

Day before yesterday in the state wher I live the farmers rejected a man who has worked for them four years and they hired a new man because the new man offered to do the work

for five dollars less than the old man. Now I want to say to you right here that this man had prepared himself in the way that the buttermakers ought to be prepared. eH never in the first place should have worked for those people and the man they hired offered to work for \$50 a month. In the second place, the man that offered to do it for \$50, he should not have sought the job. This first man did not have to seek jobs, the jobs are seeking such men all the time.

Now, then, after you have spent two or three years on the farm and two years at least in a creamery, then two full years in a dairy school, then I think you are prepared to go before the creamery board and ask to take charge of the creamery; but first I want you to get married. A man that has not got a wife to assist him in this important work has no business to take charge of a creamery. Why? The Creamery Board have a right to expect that this man's time should be employed to the best advantage; and no man can spend his time in the creamery and be hunting a wife at the same time. Now that is suggestion number one.

When I used to teach school years ago I thought it was a pretty good thing to get acquainted with the parents of the school children, then, through them, with the children, in becoming acquainted with the fathers and mothers of the children who came to me, this would greatly aid me in carrying on a successful school.

Now, then, the second suggestion is this; young man go and get acquainted with the patrons, go to his home, sit down and help milk his cows, teach him by your willingness to come there that you are interested in him. No man can succeed unless he is interested in the work that he does; show him that you are interested with him. Why, bless your soul, we can stand here and preach to you from morning until night on this subject: If you will go home and read over your last Sunday school lesson, First Corinthian, XIII Chapter, wherein Paul gives the definition of love. Why, bless your heart, it will do you good;

Right here I want to say if you will look over all the history that you have ever read, down to the present time, you will find that those men that have been successful in the world are the men and women with a feeling for fellow man; who have entered into life's work with their fellow man.

If you intend to be a buttermaker go right home and learn from the associations with him, learn all you can about him, be interested in him, study the nature and conditions of the home, associate with them, talk to him about his cattle, how he feeds them; the girls will appreciate it and the mothers will appreciate it, all his family will appreciate it. Let me tell you it will pay you in the long run.

Then again I want you to be careful at the weigh can. That is the third suggestion. A great many buttermakers are careless at the weigh can. I want you to satisfy him, to prove to him, that he is being credited with every 100 pounds of milk that he brings to the creamery. He has a right to demand that when you come there that you have the knowledge and understanding as to whether his milk is good or not. That is what he hires you for and if it is not fit to make into the finest kind of butter, you should reject it, it is your duty to reject it. Why bless you, when I went to school we had a young lady that used to have to mitten the boys once in a while to keep them around her and to keep them under her thumb. I want you if it is not fit, to send home their milk and I think they would be pleased that you sent it home.

Another thing is that you should be careful when you test milk. Farmers are suspicious. I think farmers have a right to be suspicious sometimes, be awful careful how you do that.

Now the care in making butter is the next suggestion that I would make to you. It includes all these little details that take place in the creamery, it includes the temperature of the creamery, the working of the butter, the sale of the butter, the coloring of the butter, the making of a satisfactory starter. While I say this to the buttermakers, these suggestions are practical for

the traveling man, as well, that call upon the buttermakers. No man can do his best unless he understands his business as well as the buttermakers, that if not otherwise, he should be so clothed that he could set down his grip and prepare the cream for the company at any time.

pare the cream for the company at any time.

Now in the making of butter there is one point that I wish to emphasize here tonight and that is cleanliness. My suggestion on that point is explained by placing one fact that I have just learned, since the separator has come into use, that the people who are manufacturing oleomargarine in the city of Chicago have quite recently sent circulars among the consumers of butter in Chicago, advertising matter, and in these advertising circulars they have distributed evidence that the creameries throughout the state of Wisconsin all are—that the creameries are invariably not a fit place wherein to make butter; that their places are more clean to make butter and invite them to come over to their factories to show them that their places where they make oleomargarine are much more superior to the making of good clean butter than most of the creameries. Consequently I want you when you go home to tell those that make butter to make your creamery so clean that we can refute those accusations.

Now I don't know how it is in this state, but out in Iowa, where I live, they have hand separators. The hand separators are coming in quite largely, and some of our creamery proprietors are considering whether it would be wise to pass resolutions among the members, whether it would be wise to exclude the hand separators or buy their cream. Now if you have some patrons, if you have patrons that want to sell their cream, why bless your heart just take it in as you do milk. Test it. Take it in, make the best of it—don't allow them to go away—take it in and make the best of it; if you are equipped as I suggested you should be, you will have no trouble whatever. I say by all means take in the hand separator business.

Right here I want to make a suggestion whereby you can make us traveling men beneficial to you. Now in traveling about from place to place we become kind of news distributors. The traveling men are good organizers, some are. We have one down in Mason City, Iowa, his name is Sam Schilling, he has served his second term as an organizer of little educational meetings, little district meetings where buttermakers come together, where they discuss how to breed and how to feed and how to care for the milk from the time it leaves the cow and put into the milk can and how to make butter. They discuss all these even to the buttermaker—they bring their butter there and have that butter scored right in front of you, why have your butter scored, have them point out to you why one batch of butter is better than another. This object lesson makes the best impression that I know of. This theory don't amount to a row of pins.

These large meetings, such as we have had here in Milwaukee last October and in St. Paul two years ago this winter are all right but for real educational purposes these little district meetings beat them all to pieces. One of those little meetings are worth more than ten of these big meetings. Why! When we go to one of these big meetings we want to go to the shows, to the theaters, and sit in the back seat and a good many of us never occupy a back seat, and you can't blame the buttermakers if they want to take in these things, if they want to stand in with the salesman or commission man and he wants to show them the sights. Now I want to say to you organize these little meetings, get your traveling men to call on you in this state to assist you, traveling men as a rule are good organizers, here is Brother Moore, of Chicago, why just get them to come, ask them to help you organize these meetings and I don't want you to forget one of these traveling men either. These traveling men are good social members. Why down there in our state they call them grafters, in our state they make them pay one dollar every time, while the buttermakers are let in for twenty-five cents. I never spent one dollar any better in my life.

Well there is just one more thing that I want to say, don't forget these conventions and these tests, these six months tests for instance, take part in them. However we sometimes run across a man who says I don't know the judges ain't exactly square if he don't get the highest scores, he thinks something is wrong, he thinks that the judges have been prejudiced.

Now I want to say to the buttermakers that the judges have no interest in that whatever, they want to help you out the best they can. Why should they want to favor one more than another, no reason why they should. I don't suppose there was ever a time when they knew whose butter they were scoring. I want to say right here there is only one man that can score highest, there may be one or two that may score second highest, but somebody has to score the highest, don't you see. If you have one hundred entries don't score the judges, take part in keeping the good work going. That is all I have to say. Thank you for your kindness.

Music.

OBSERVATIONS AMONG SWEDISH CREAMERIES.

BY RICHARD A. ELLIOT, MADISON, WIS.

I am somewhat afraid that a paper on this subject will not be of a great interest to Wisconsin creamerymen. Advanced and modern creamery methods in countries, in which the butter making industry has become one of importance, must necessarily be more or less similar. Before I proceed to point out some differences between American and Swedish methods I should like to give you a few data regarding the history of the creamery industry in Sweden.

In the beginning of last century milking cows were considered a necessary evil rather than a source of profit. One of the first books dealing exclusively with the manufacture of butter was

published in the year 1802, by a Dr. J. Anderson. He advocated a shallow pan system and a temperature of 50 to 56 F. for the creaming of milk. The cream was not to be removed before the milk was sour and partly coagulated. It is curious to note, that even a hundred years ago a good many things were known regarding the properties of milk. He points out the thinness of the foremilk and the richness of the strippings and also that the milk loses a great deal of its creaming quality if it is not set immediately after it is drawn from the cow. He also mentions that when milk is mixed with water before it is set it will cream more readily, but the quality of the cream will be impaired. He was of the opinion, that butter could not be obtained unless the cream were sour. He says: "If it is attempted to churn cream before it is sour, churning must be continued until the proper degree of ripeness or sourness is obtained or the butter will not come. The dairyman should therefore keep the cream until it is quite thick and sour and it may be kept for several weeks without injuring the quality of the butter."

He recommends washing the butter, but in other respects his method is extremely crude.

About the year 1840 the Holstein method was introduced, It was practically the shallow setting method, but attempts were made to keep the milk sweet while creaming and it was set in underground cellars, well ventilated and built for that purpose.

About 1846 it was found that good butter could be made from sweet cream.

The shallow pan system with various modifications was used up to between 1860 and 1870 when a method, claimed to be invented by a Mr. Swartz about the year 1864, gradually began to displace the previous methods, namely the ice system. About this time the first large creameries appeared, and from 1870 up to the time when the continuous separate was invented, the deep setting, or, as it was called, the ice system, was used

exclusively. In 1887 Dr. de Laval of Stockholm solved the problem of a continual separation of cream and from that time the creamery industry has grown by leaps and bounds, greatly aided by liberal government appropriations for instruction as well as by a great activity on the part of the different experiment stations in Denmark and Sweden.

Creameries, in a modern sense, did not exist in the country until about 1870. Between 1850 and 1860 attempts had been made to establish so called village or district creameries. They were a kind of proprietary creameries, but as the ice and deep setting systems were not known then, the product was of a very inferior quality, and these creameries often were shut down for want of support, as the farmers could do about as well with the cream by handling it at home.

Therefore these creameries disappeared, and after the introduction of the cold setting system creameries operated by companies or private owners came into existence. Cooperative creameries were started between 1885 and 1890 and have increased in number every year since then, while the number of proprietary creameries is decreasing year by year.

With regard to the character of the creamery buildings in Sweden I may say, that they are without exception built of stone or brick. They would never think of erecting a frame building with wooden floors for a creamery over there. The buildings are stone and brick throughout, the outside walls often being very thick. The partitions between the different rooms are also of brick and stone. Cement floors are seldom seen; flat, smooth, square or rectangular stone slabs with cemented joints being generally used.

The engine and boiler room is of course separated from the making rooms. There is generally a tendency to divide the building into several separate rooms for the different processes and stages of manufacture. Thus you will generally find a separator and intake room, also separate rooms for churning, ripening cream, working butter, etc.

The Alpha Laval separator is almost exclusively used throughout the country.

The separating temperature used to range between 84 and 100 F. and the De Laval people used to recommend this temperature as giving the best results with their machine. Later we have learned, however, that a more effective separation may be obtained at a somewhat higher temperature up to 150: F but this pasteurizes the milk and is not generally used. The skim milk from the separator flows into a tank, from where it is pumped into the cheese vats in another part of the building to be made up into skim milk cheese, or, if intended to be used as food, it is pumped into a pasteurizing machine, pasteurized and quickly cooled down. The pasturizing apparatus for both cream and skim milk are of the continuous type. The cream is supposed to be retained in the pasteurizer for 20 minutes. The capacity of the pasteurizer is of course adjusted to the quantity of the cream handled at the creamery so that the cream is pasteurized, cooled down and ready to be warmed up to ripening temperature shortly after separating is over.

Practically all high grade butter intended for the British markets is made from pasteurized cream. I do not think that you will find a single creameryman there who does not believe in pasteurizing. Although not enforced by law in Sweden as it is in Denmark, it is nevertheless general as they have found out that it pays. The pasteurizing temperature is generally in the neighborhood of 185 F., which would seem to us here to be unnecessarily high. To enable them to use such a high temperature, they cool the cream rapidly to a very low temperature, preferably below 40 F. I have sometimes found butter over there to have a cooked flavor, caused by a high pasteurizing temperature especially when the cream was not cooled down rapidly to a low temperature. A slight cooked flavor, however, is not considered to be a very serious fault and will often disappear after a few days. It is claimed that a high pasteurizing temperature and a rapid and thorough cooling will effectively

remove some objectionable flavors from the cream, especially feed taints.

When the cream is all pasteurized and in the cream vat it has generally a temperature of 45 F. and must therefore be warmed somewhat before culture is added. The Swedish method of ripening cream differs considerably from the American method. They believe in a low ripening temperature, a small per cent. of starter and give the cream 18 to 20 hours to ripen. I do not know that this method is to be preferred to the one practiced here, viz.: a high temperature, 10 to 20 per cent. of starter and 4 to 5 hours for ripening. There has been considerable controversy regarding the two methods in Sweden and personally I think that the American method is a handier one. It is claimed, however, that by ripening at a low temperature a better body in the butter is obtained, but probably there is not much in it as just about as good butter is made here by the American method.

The churn used in Swedish creameries is the Holstein churn, which would no doubt seem antiquated to an American. It is stationary, barrel shaped, somewhat wider at the top than at the bottom and has an upright revolving dasher. When churned, the butter is taken out with sieves and washed in a barrel or vat containing pure, cold water. It is then put into a trough and allowed to drain. The combined churn is beginning to come in now, however, and will no doubt in time displace the Holstein churn in most of the large creameries.

A worker similar to the Mason is used and the butter is generally salted on the worker. When it is partly worked it is taken out and placed in ice boxes and left for about two hours. It is then finished on the worker and packed. Swedish and Danish butter is packed in casks made of beach holding about 112 pounds each.

The butter is never stored or held at the creamery but is shipped to the buyer at least once a week so that it reaches the British market when it is about 10 days old. An ordinary ice-cooled room will therefore give all the refrigeration that is

needed because the summers are not as hot as they are here, and, owing to the substantial character of the buildings and the material employed, the rooms never get very warm. The windows are whitewashed in the summer and this helps to keep the rooms cool.

There is considerably more help employed in a creamery over there than here and consequently everybody has ample time to do his work well. Except in the smallest creameries there is an engineer to attend to engine and boiler. He generally cleans and puts the separators together also, but does not run them. As a rule the manager does not do much hard work round a creamery. He sees that everybody is doing his share of the work properly, attends to the ripening of the cream, bookkeeping, etc.

The farmers generally take pretty good care of the milk, especially in dairy sections and the milk is in most cases delivered every day, Sundays included. It is to be hoped that this custom will be abolished when the farmers have learned the simple art of caring for their milk. The milk cans hold about 12 gallons (50 litres) and in a good many creameries they are washed in soda solution every time, rinsed and steamed before they are returned. The milk is generally drawn to the creameries in loads.

In some co-operative creameries the skim milk is returned to the patrons, but in most cases it is made up into skim milk cheese, for which there is a great demand.

With regard to the basis of paying for the milk I regret to have to say, that the old pooling system in many places still prevails, at least it did four years ago. The De Laval Lactocrite was found to be too complicated and difficult to manipulate. The butyrometer, which was invented over there somewhat later, is simpler and is used in a few places. A few creameries use the Gerber test. Where the pooling system is practiced in a co-operative creamery, the profits are divided according to the quantity of milk each shareholder sends to the creamery.

The creameries vary considerably in size. There are quite a number of small creameries although most of these are very well equipped. There is, however, a strong tendency towards centralization and combination of smaller plants into larger establishments. This has long been advocated by dairy authorities and the number of large central creameries is increasing.

When God divided the waters from the dry land he appears to have forgotten Sweden. At least that is the explanation given by some of the fact that about one-tenth of the entire area of Sweden is water. All over the country are innumerable rivers and creeks and thousands of lakes, large and small, ranging in area from 2,400 square miles to half an acre. In such a well watered country it is evident, that little difficulty is experienced in finding suitable locations for creameries with regard to water supply and drainage facilities.

There are a number of well equipped dairy schools in the country maintained by the government. They have a 12 months' course and a certain standard of education is required for entrance as well as one year's practical experience in creamery work.

Home dairying or butter making on the farm is not taught in any of the dairy schools nor is it at all encouraged. It is generally recognized, that the factory system is the only right one and wherever there is a creamery the farmers support it. Farm butter making in creamery sections is condemned, and justly so, as it is estimated that the country would lose between 5 and 10 cents for every pound of butter made on the farm.

The hand separator has not gained much ground in Sweden, and there is no likelihood of its doing so for a long time to come, as the present system is giving good satisfaction.

The country is divided into 25 dairy districts and the government maintains a competent instructor and inspector in each. It is his duty to go wherever his services are demanded within his district at a very small cost to the party who needs him. The De Laval separator company also maintains a dairy expert

who is constantly on the road and ready to give his assistance to any buttermaker in trouble, and the importance of instruction by competent men in the different branches of dairying is well recognized as well as admirably cared for.

Music.

The President then announced that the next speaker, Mr. R. C. Cook, was reported sick, so that this concluded the program for this evening. Meeting adjourned until tomorrow morning at 9 o'clock.

WAUKESHA, WIS., FEB. 26, 1903.

Convention called to order by the President at 9 o'clock A. M. and the following proceedings were had.

Music.

CREAMERY BUILDING AND DRAINAGE.

BY PROF. OSCAR ERF, OF ILLINOIS.

Creamery Building.

The keen competition in modern buttermaking necessitates systematized work. The minor details closely allied, in this vocation, must be taken into consideration in order to lessen the cost of manufacturing butter and at the same time to produce an improved article. To do this we must look for the most improved and economical methods, take advantage of all natural means, locate judiciously, manage affairs on business principles, and look for more convenient arrangements. The latter is the easiest to obtain and yet in glancing over the different factories that are in existence at the present time, we find this point sadly neglected. There is a need for better creamery buildings.

Buildings that are more convenient in arrangement so that they can be kept sanitary.

In launching into this business we must first look for a suitable location.

The most necessary requirement is to locate near the center of a milk producing district, or rather in a section of the country where the people are naturally inclined toward dairying. It is essential to have a sufficient number of cows that will insure enough milk to make a creamery profitable.

Cost of Operating.

The total cost of running a creamery and marketing the product, including interest on the investment and provision for a sinking fund, ought not to exceed $3\frac{1}{2}c$ for every pound of butter made. Under favorable conditions this cost ought to be reduced to $3c$ or even as low as $1\frac{1}{2}c$. The smallest practical creamery cannot be operated for less than \$4 or \$5 per day. It becomes evident then that the daily product should be over 150 pounds as a safe minimum. Consequently no creamery should be put into operation unless having control or a promise of about 300 cows.

A reliable supply of good, pure water is another requisite of importance. Cold water is advantageous in every respect and at the same time saves ice.

The surroundings should be such as to insure pure air with little dust and a maximum amount of direct exposure to sunlight. A lawn around the creamery with some trees and shrubs will aid in purifying the air besides making the surroundings more attractive.

A creamery should be located within reasonable distance of some shipping point where the product can be marketed to the best advantage and so that the factor of transportation shall not enter in to offset the profit.

Dimensions of Building.

It is rather difficult to give the dimensions of a creamery to suit all conditions, however, there is this fact to be borne in mind, that the working rooms of a creamery should be built small and compact, and convenient in order to save labor in keeping the creamery clean. As an approximate estimate I should say that a creamery handling milk from 400 to 600 cows should contain from 900 to 1,200 square feet of floor space, not including coal space and store room.

Plan to Suit Location.

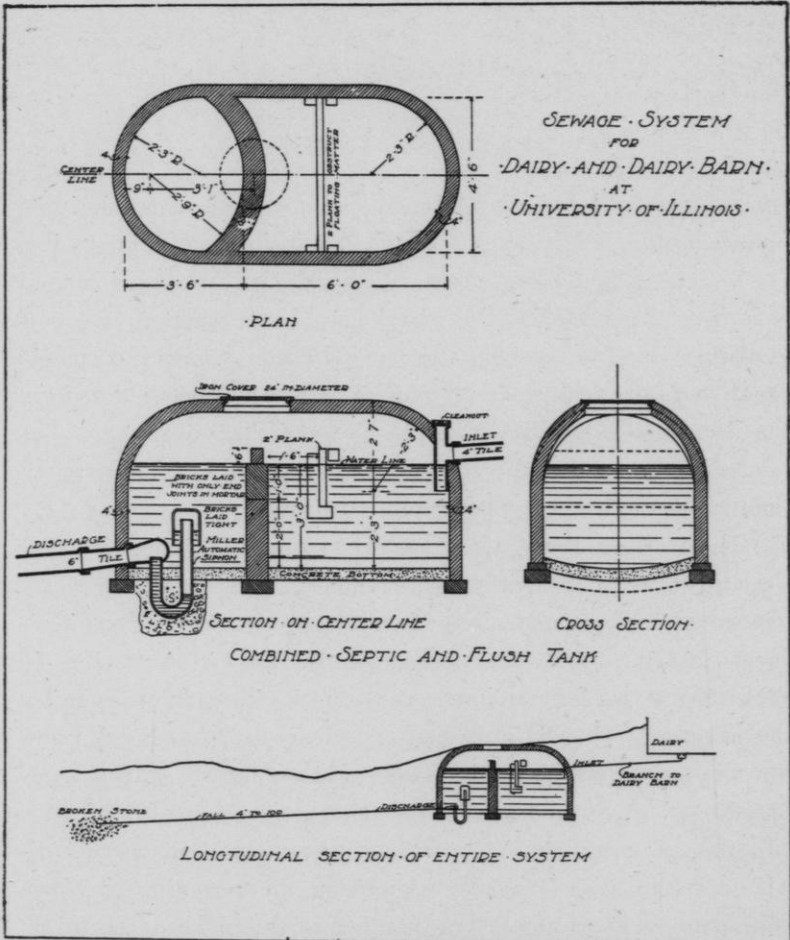
Since dairying is carried on in such a wide range of latitude and longitude and to such a varied extent, it becomes impossible to have set a plan for a creamery suitable for all conditions and requirements. Hence, the wisest plan I can suggest, if a new creamery is to be erected, is to put it into the hands of a competent and practical creameryman of wide experience, and have him outline a building to suit the particular situation. The extra remuneration for the service of such a man is soon regained in the saving of labor and expense.

There are, however, a few essentials which every buttermaker should think of in arranging a creamery. He should try to arrange his building and machinery to secure both convenience and cleanliness and so as to perform the labor in the factory in the easiest possible manner and under the most economical conditions. All who have had experience in a creamery know of the loss of time and the waste of labor resulting from some seemingly small mistakes in the construction of the building, as for instance putting a door in the wrong place, or locating the boiler room at a distance, or putting the receiving platform three or four feet higher than the bed of the highest wagon that comes to the creamery, or locating the separator and cream vat at a great distance apart which necessitates the cleaning of long milk or cream conductors. These faults should be foreseen in

order to save the operator as much work as possible and to enable him to reach given points easily and without unnecessary steps in a roundabout way.

Septic Tank Drainage System.

In constructing a creamery we must continually bear in mind that whatever we build must be built so that it can be kept in a



SEPTIC TANK FOR DISPOSAL OF SEWAGE ON LEVEL LANDS—ORGANIC MATTER IS DESTROYED BY BACTERIA AND THE CLEAR WATER THEN SOAKS INTO THE SOIL AT TILE OUTLET.

sanitary condition. The first essential is to find some way to dispose of the creamery sewage in a cheap and effective manner. This can easily be done, in any location where the solid rock does not come to the surface, by means of a septic tank and filter bed to purify the creamery sewage.

This septic tank is nothing more than a solidly built vault or box of such capacity as to hold the sewage that runs from the creamery every twenty-four hours. The object of the septic tank is to settle the organic matter in the sewage at the same time serve the purpose as a receptacle for incubating the bacteria which decompose the organic matter into gas or a solution which is carried through into a filter bed where these constituents are absorbed by the soil and the water that is liberated therefrom is purified.

Construction of Septic Tank.

The septic tank may be constructed of either brick, grout or wood, brick or grout being preferable. It should be so arranged that the rush of the incoming sewage will be checked before it reaches the tank in order not to disturb the flocculent matter that is settling in the tank. It should also be arranged with cross partitions between the inlet and the outlet so that the floating and settled material will not move with the current of water and obstruct the outlet of the tank. The tank must be located in the ground under the frost line so that it may be kept at a uniformly warm temperature in order to induce the growth of the bacteria which will decompose the organic matter in the sewage. Large quantities of either hot water or a strong disinfectant must not be put into the tank as such things will destroy the germ life. With these precautions the organic matter will thoroughly decompose and the tank will remain practically free from sediment providing that little inorganic material such as sand and mud, has been deposited in the tank. And consequently it is not necessary to clean the tank more than once a year.

If flowing water is at hand a septic tank is all that is necessary, since decomposition has gone on to such an extent that no odor arises. Under all other conditions a filter should be used in connection with the septic tank. The filter bed into which the sewage flows can be constructed in various ways depending on the soil of that particular locality in which the plant is situated. The most common and probably the cheapest way to make this filter where the soil is composed of sand, loam, or clay, is running a tile drain into a field and from this a series of branches so as to distribute the sewage over a considerable area. Drain tile should be laid on the same level, intercepting these sewage tile, for the purpose of taking up the superfluous water and thus prevent the ground from becoming saturated. If the soil is of a hard texture or if a hard pan lies near the surface the sewage can then be discharged into a small bed of sand which is thoroughly drained and aerated and which acts as an excellent sewage purifier. This method of sewage disposal is very economical. The cost of such a plant varies from \$20 to \$80, depending upon the construction, the size of the creamery, and the particular locality in which it is situated.

Brick vs. Wooden Creamery.

There is no question but what a brick building is not only the most sanitary but is also the cheapest in the long run. Although the first cost may be somewhat greater, in some localities of the central states, for a brick than for a frame building, yet when the high insurance and the necessary repairs of a frame building are considered, it will be found that the brick or grout creameries are not too expensive as is commonly thought, or too elaborate for creamery work.

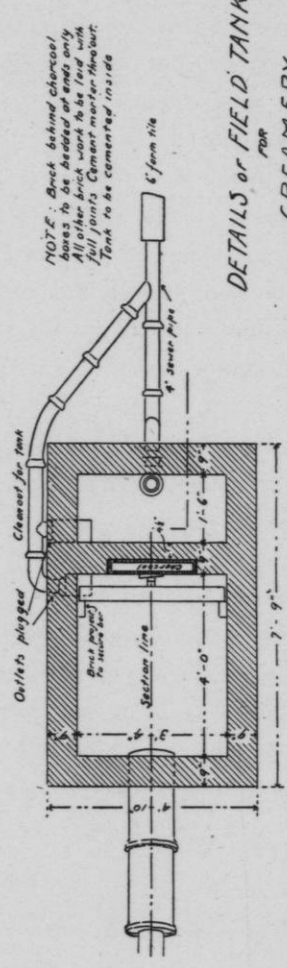
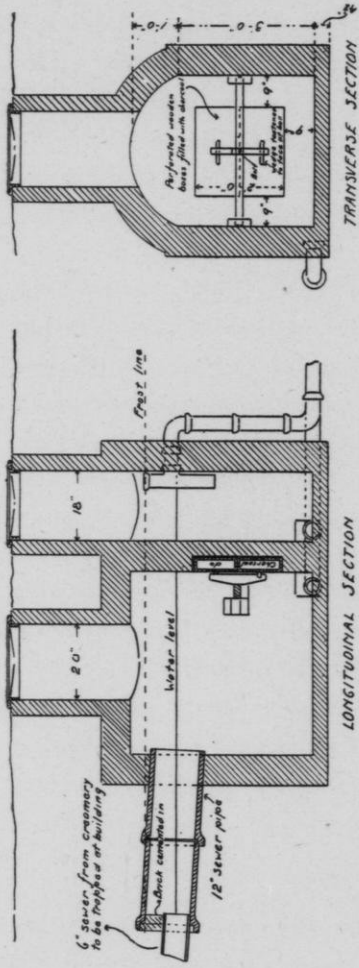
In choosing either brick or frame walls the building should be placed on solid foundation walls. This foundation base should not be less than 18 inches in depth and 15 inches in width. It can be constructed of either grout or brick, grout being the cheaper of the two. On this foundation, a wall should

be built 15 to 18 inches high, the width depending on the material used. If common wall stone is used, about 15 to 18 inches would be the proper width; if range stone, 10 to 12 inches would be sufficient; if made of solid or hollow brick, 12 inches would be ample in width. If the building is of brick a two course would be sufficient for a single story building. The walls should have an air space and should be bound together by means of wire stays. If the walls are to be constructed of wood either 6x6 hemlock sills can be laid on the foundation, on which should be placed 2x4 scantling, or a box sill may be made, of Norway pine, from 2x8 planks.

The scantling should be boarded on the outside with cheap lumber, paper and sided on the paper with siding. The inside of the 2x4's should be lined with paper, nailing an inch strip on the scantling, reline this with paper and follow it with common ceiling. This will make a very cheap and effective wall with two air spaces. Lath and plaster may be substituted for the first layer of paper on the inside of the scantling but only at a greater expense and with no particular advantage. An artistic, durable and fire proof roof can be made by the use of slate; however, where cheapness is desired, galvanized iron roof without cornice is much cheaper and equally as good. The rafters on such a building may be of common hemlock or yellow pine, and of 2x5 in size for shingle, or a galvanized roof, depending somewhat on the width of the building. If slate is to be used the rafters should be 2x6.

Choice of Floors.

It is very essential in every creamery to have a good sanitary and substantial floor. There is no question but what cement fills all the requirements and if constructed properly is much superior to wood. I think all buttermakers will agree on this point. The chief objection to cement floors is that they are too cold and moist for the health of the operator, and this is the reason more creameries do not have them. This difficulty is



NOTE: Best kind of cement boxes to be used on top. All other brick work to be laid with full joints. Cement mortar floor. Tank to be cemented inside.

SEPTIC TANK FOR DISPOSAL OF DRAINAGE FROM CREAMERY—SHOWING A METHOD OF CHEAPEST EFFECTIVE CONSTRUCTION.

entirely a fault in the construction of the floor and can be easily overcome by laying the cement floor in the following manner: Lay the cement floor at least one foot above the outside ground surface. First lay a tile drain, close to the foundation, around the inside of the building, and to make things better lay one or two drains through the center of the building and connect this with an outside drain. Fill in with cobble stones or broken stone to the depth of three or four inches, then fill in with three or four inches of cinders. If the cinders are more easily obtained it is preferable to use them throughout. The next three or four inches of cinders should be mixed with common cement or sand, applied evenly and thoroughly tramped, using an approximate proportion of one-third common cement, one-third cinder, and one-third sand. On the top of this spread a coat two inches thick of Portland cement, one-third cement and two-thirds coarse gravel. Finish with a one-half inch layer of Portland cement mixed proportionately half sand and half cement. Let this thoroughly harden and a good floor can be insured if the sand used is clean and well mixed with cement, the cement fine and freshly burned, and the mixture not moistened too much so that it can be well tamped. This makes a floor that is more expensive than is commonly advocated; however, it is economy in the long run to pursue this or a like method, as a cheap cement floor in a creamery is next to no floor.

Heating Pipes Keep Floor Warm and Dry.

If the proper thickness of cinders has been used below it can be guaranteed that the cement floor will be dry. The objection of floors being cold can be readily overcome by laying $2\frac{1}{2}$ or 3 inch tile in the first layer of the cement, through these tile run 1 inch or 3-4 inch steam pipes. Connect this steam pipe on one side with the exhaust pipe of the engine, on the other side with the sewer. Regulate the amount of exhaust steam by means of a valve to go through these pipes which act as condensers and at the same time will warm the floor of the creamery, making it

more healthful than any wood floor that can be constructed. hence, I can conceive of no case where the wood floor should be used unless the creamery is a two story building or with a cellar underneath, and even in this case it would seem to be economy to use a cement floor on top of the wood floor. In this case the wood floor must first be covered with paper, then two or three inches of cinders must be spread on the floor to allow for the contraction and expansion of the wood, and cement on this as before.

In creameries it is always advisable to have the floor corners rounded and a wainscotting of 18 inches to 2 feet built of cement. This is advantageous in a brick or even a frame building.

A cement floor in a creamery should have a slant, of 1-4 inch to every foot toward a drain. This drain is sometimes made of cast iron but it can be made of cement which is just as durable and much cheaper. The bottom of this drain should have a slant of 1-4 inch to every foot toward an inlet to an underground drain which should be connected at this point with a bell trap to prevent the oddors from the sewer coming up into the factory.

Where it is necessary to build a wooden floor in a creamery it is wise to have the joist not more than eight inches apart in order that the floor can be firmly nailed and prevent warping. At the same time the joist should always be laid full strength on the sills and cross sills. To be economical in material never span more than 12 feet without having a support. The flooring should be well matched and dressed, 1 1-2 to 2 inches in thickness and securely spiked to each joist. When completed the floor should be covered with two coats of boiled linseed oil, applied hot and thoroughly ironed in with hot irons.

Points of Economy in Convenience.

In building a creamery it is very essential to know what method is preferred for conveying the milk from the receiving

vat to the cream separator, whether this is to be done by gravity or with pumps. Different floor elevations are required in these methods and each has its advantage and disadvantage. It is merely a question with the operator whether he prefers to climb four or more steps or to clean one of our simple modern milk pumps.

The machines in a creamery should be so placed as to avoid the use of long conductor pipes and the pipes should have as few angles and joints as possible. Special care should be taken to select pipes that are smooth on the inside. Tinned copper or brass pipes are the best although drawn steel tinned on the inside may be used to advantage. Rubber hose should never be used for conducting milk, or cream even for the shortest distance.

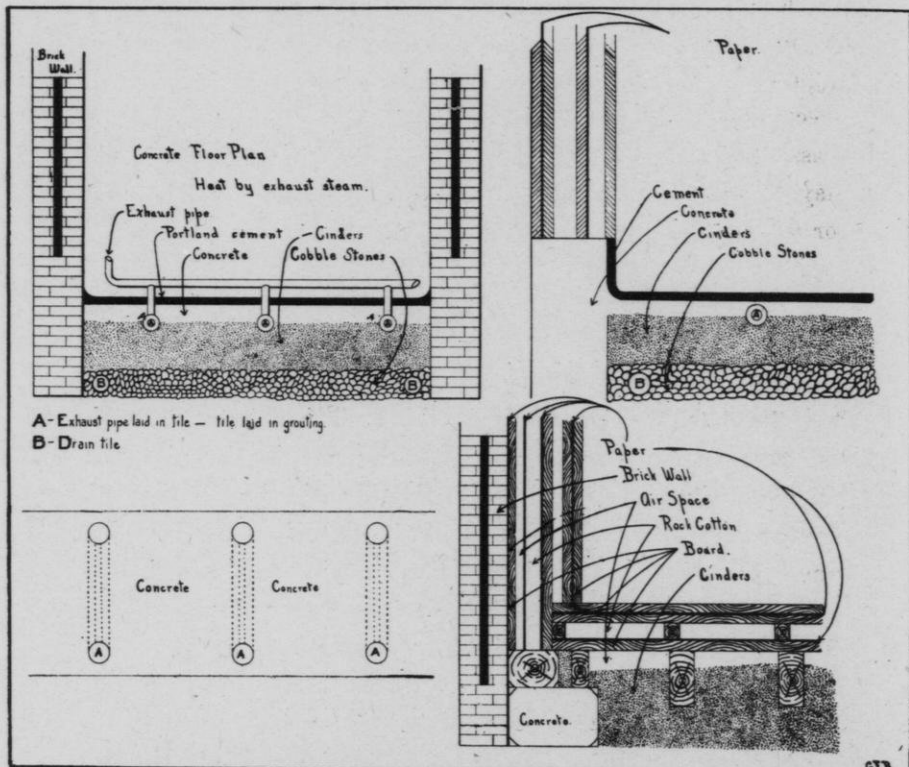
The Refrigerator.

Another necessary adjunct to a modern creamery is a good, well insulated refrigerator. As the conditions vary so much in a creamery, it is rather difficult to estimate the size of the refrigerator, but a practical height should never be less than $6\frac{1}{2}$ feet and the ice box above it should be as high as can be made under the rafters although this never ought to be less than 5 feet. In building a refrigerator an important point is to have it well insulated so as to retain the cold temperature.

The method of insulating these refrigerators differs greatly, but in running a series of tests at our station last year we reached the conclusion that some insulating material in the center of the wall, well protected from moisture by double thickness of paper and boards on each side and with a dead air space on each side of this insulation, gives not only the best results but is also the cheapest. This insulating material can consist of rock cotton, granulated cork, or planer shavings. Since the shavings afford an excellent place for vermin it is very necessary that they be disinfected with some poisonous

solution like copper sulphate or corrosive sublimate then the shavings must be dried (again) thoroughly.

Great care should be taken in building a good, well insulated floor in this refrigerator; not only should the floor be insulated as the sides, but beneath the floor the space between the ground and the boards should be filled in with fine cinders.



A-Exhaust pipe laid in tile - tile laid in grouting.
B-Drain tile

EXHAUST STEAM HEATING PIPES UNDER CEMENT FLOOR AND REFRIGERATOR INSULATION.

It is always well to have the ice box located in such a position as to induce the greatest movement of air in the refrigerator; this is very essential to good refrigeration. Hence, the ice box placed above the refrigerator seems to be the most efficient location. The refrigerating room below should be connected with the ice box above by means of a flue on one side to

receive the upward current of warm air and another flue on the opposite side to receive the downward current of cold air.

In building such a refrigerator it is almost necessary to build an ante-room to it, for while entering the refrigerator one door can be closed while the other door is open. The inside of refrigerator should be painted with soom good cold water paint.

The Icehouse.

Where ice cannot be secured from ice companies it is necessary to have an icehouse in connection with a creamery. The dimensions of the icehouse depends upon the purposes and the capacity of the creamery. Ordinarily an icehouse of 150 tons capacity is ample for a creamery handling from 8,000 to 10,000 pounds of milk a day. As a cubic foot of ice weighs fifty-five pounds an approximate estimate of size can be made from the above for creameries in this latitude.

An icehouse may be built of single or double walls, depending upon the ease and cheapness with which ice can be secured in winter. It is not generally advisable to have an icehouse directly connected with the creamery building, but it should be located close by in order to save labor in getting ice. Convenience in using the ice is more important than location of building as to grounds or ice supply.

The Inside Finish of Creamery.

The inside walls of a brick creamery may be plastered and painted or the rough walls may simply be painted with two coats of oil and white lead and a third of white lead and varnish; both methods being sanitary, the latter being the cheapest.

The windows should be large and placed well above the floor and should be arranged so as to drop from above as well as below, in order to secure good ventilation. The creamery should be provided with a ventilator on the roof and passages connected with the rooms below to carry off the steam and heat.

Boiler and General Fittings.

The boiler of a creamery is really a part of the building. It is a difficult matter to estimate the size of a boiler for a creamery but I will say that it should be large and of good capacity. A large boiler may not be as economical as a small one; where run to its greatest capacity, however, it requires less labor to fire such boiler, which is a greater factor than fuel in many of our creameries. There is no particular preference of boilers but I will say that the better the boiler is insulated on the outside, as the bricked in boilers or the modern marine boilers, the better it is for all purposes in a creamery.

I believe in a sterilizer and dry room for a creamery and this can be most economically located near the boiler where the heat of the boiler, which would be otherwise wasted, will serve to dry the utensils.

Water should be piped with galvanized iron pipes and steam should be piped with black iron pipes to all vats, to the sink, the churn, and in case of a whole milk factory, to the skim milk tank.

The skim milk tank of a whole milk creamery should be lined or made of galvanized iron in order that it may be kept clean and sanitary. The ground around the place where the skim milk is drawn should be paved in such a way that the drop will run off into the sewer. It is necessary to flush this place every day during the summer to keep conditions sanitary around the creamery.

The exhaust steam should never be wasted but utilized for heating the building or scalding the skim milk in order to keep it sweet until it is fed.

The Heating System.

There are a great many different schemes for heating a creamery and yet I might say that a majority of the creameries have no system at all. The simplest heating system and the

one that works best is where steam is forced through a series of heating coils arranged in the rooms of the creamery and connected with the hot water tank above. The unutilized steam that passes through these coils is thereby not lost but serves a purpose for heating the water in the insulated tank above.

There are a great many other minor details too numerous to mention in a paper of this kind, but in planning a creamery these little points will come to a practical man.

ADDRESS BY S. B. SHILLING.

Mr. Chairman, Ladies and Gentlemen:

I did not come here to make a speech, I came here to listen to speeches; I can assure you that I have been well paid for the coming by the excellent addresses that you have had at your convention; I never have had the pleasure of meeting before with the Wisconsin buttermakers. My ideal of the Wisconsin buttermakers has been high, and I can assure you that it has not changed by this meeting.

I am exceedingly embarrassed, not knowing that I was going to be called upon or that I was to say something, but then I am going to tell you of a great Presbyterian minister, he was going to take a trip across the ocean, and as he had never crossed that great body of water, he was going around seeking all the information he could as to the different sensations and what he was to experience in taking the trip; among them an old salt had told him that just so long as sailors continue to swear you are alright, but just as soon as you see the sailors get down on their knees and stop swearing, then you can make up your mind that your time has come. Well the minister took the trip across the ocean, and after they were out on the water several days a storm arose, and he was going up and down the deck,

and every little while he would go up and listen down in the hole, he looks up and he says, thank God they are swearing yet.

The President in introducing me to you has told you that I was interested in buttermakers' organizations, and I am. We have in the state of Iowa district buttermakers' organizations, and I want to tell you that they have done more good than anything else in the state; they are being called schools of instruction. At these meetings the Dairy Commissioner sends his deputy to give instructions; he also sends one of the professors from the state dairy schools to score the butter, point out the defects, tell the parties how to remove them, and it has resulted in more good than anything else in this state. You can get together in your localities most of the buttermakers. The traveling men and commercial agents are allowed to be there, but we have nothing to say, and we understand that these are buttermakers' meetings.

Further than that, I understand by a gentleman who occupied the platform that you are trying to get more instructors for your state; you are in the same position then that we are in; we are thoroughly organized in the state of Iowa today; we are going before the next meeting of the legislature and ask for what we want. I tell you that we are in a position to get it as we never were in a position to go and ask before.

You have got to act collectively; let your legislature know that you want something. You are going out to your state legislature to tell them that you want five or six more inspectors, and I hope you will surely get them.

I am going to tell you another story. I had the pleasure, while sojourning in southwestern Colorado, of meeting a hotel man, who said that he could tell the political complexion of any man that comes to his hotel. I tell you if a Republican comes into my house, he comes in, goes to the washroom, washes himself, combs his hair, and sets down, takes a paper and reads it; if a Democrat comes along he will go to the washroom, wash his hands, combs his hair and leaves the water in the bowl. The

temperance man is the worst of all, he will come in and wash himself in the dirty water left in the bowl by the Democrat and not comb his hair at all.

I represent the National Dairy Union; I don't feel that I would do my duty if I did not tell you about it, and for that reason it give me pleasure to state I believe of all states in the Union that the Wisconsin Buttermakers are giving us the most important assistance. (Applause.) We have got a peculiar work to do; we are today facing a great problem in the shape of Oleomargarine, and the game in which we have got to meet them. We have got to meet them in an educational way. If you had asked why I am doing this, why I stand before you and talk, you might think I want to sell something, it would be inexcusable, and I know that you will be surprised when I tell you that since I came here last night I think that I have received orders for as many as 120 books. You ask what the National Dairy Union is doing; we are sending these books out in dozen lots to the buttermakers free; we ask them to take the books and dispose of them, returning to us the money, we paying the charges on them; but you also assist this National Dairy Union in carrying on the work in your behalf.

THE PRICE FOR BUTTERMAKING.

BY C. J. DODGE, OF WINDSOR.

At what price per pound can butter be economically made at creameries? There are so many factors to be considered in the question of the cost of making that a good many creamery-men are apt to lose sight of a part of them and laboring under the impression that they have considered them all, are surprised at the end of the year, or of a series of years, to find their cash balance on the wrong side of the ledger. Creamery men are human, the same as the farmers are. They often hate figuring

and calculating and planning, but like an active do-something life, as the farmer hates bookkeeping, but enjoys the active life he lives. Now it seems to me that the creamery man has an absolute duty to himself and to his patrons in the matter of the bookkeeping part. He must have a complete and accurate account of each day's receipts of milk, the amount of butter made from it, the number and size of packages made each day, the yield each day, the full account of the retail butter, and by full I mean the name of the party sold to, price, and any fact that afterwards may be of service in settling a dispute that might otherwise arise. I think it always best to close this report with a record showing the first package left over, as 12 pounds solids and 20 prints. My reason for this latter entry is for the purpose of proving up the work the following day. A man as busy as a creamery man is, with 40 or more patrons after him, is liable to forget to make a record now and then. If now he has the closing record of the previous day he can prove the accuracy of his work, and if he has a shortage can think back and locate the man that got the butter that is not recorded. I have found this so valuable in my own experience that I have adopted it in all my creameries. Having the weekly reports show the daily details. All this may seem a little out of line with my subject perhaps, but it is not, for first of all the creamery man must know absolutely what his month's butter is going to bring before he can take the first step towards making his dividend. When he has that point established he must first take out the making, and our question deals directly with this—what shall it be? Now in all ordinary creameries there are expenses that are constant whatever may be the sum. Taxes, rent, original cost and interest on same, to a certain extent fuel, help. In other words, so far as these are concerned 1,000 or 6,000 pounds daily is near the same as to expense. This rule does not apply to supplies, of course. Then there is the question of cost of fuel that is a varying factor in different places. Some must burn \$6 coal, some \$7, some \$3 coal. Some must

pay heavy taxes, some light. Some are running a creamery worth \$1,000, some are worth \$5,000, and the \$1,000 building may be doing the business, and so it goes. I have made a careful study of this question with the idea of doing full justice to all and after twelve years of experience I must say that the creamery man who attempts to make up for less than $3\frac{1}{2}c$ per pound when the runs will not average 4,000 pounds daily the year around, is taking grave chances. It is my opinion that most of the failures in the creamery business are due to haphazard work and not getting out the making; and I tell you brother creamerymen, that it is not for your protection alone that you do this, but it is for the interest of your patrons as well. The surest way to kill the creamery industry in a community is to have the creamery fail.

Perhaps some of you will say this does not help us in determining the absolute cost of making a pound of butter. This question puts me in mind of a scene in a play I saw when I was a kid and could laugh easy. A darky was propounding the end man a question: A ship was 200 feet long, 30 feet wide, 25 feet deep, had 3 masts and could steam 15 knots an hour. The darky very impressively emphasized each detail in his characteristic way of the problem. "Then de question is, sah, to figure dis all op and tell me de captain's name." Now it seems to me that the cost of making is about as hard to figure out as the captain's name was for the end man. I think, however, that using as a basis \$50 help, \$4 coal and \$2,500 investment with 10 per cent. interest on the same, the making can be safely and justly made on the basis of this: The factory must always pay the expenses of running when running less than 4,000 pounds per day. The creameryman to get $3\frac{1}{2}c$ per pound when running 4,000 pounds per day to $2\frac{1}{2}c$ when running 9,000 pounds, taking off 1 mill for each 500 pounds increase in milk. With extreme prices of fuel the difference between the actual cost and the \$4 price, should be stood by the dividend. My reason for this is that it is an extreme price and creamery-

men in making their calculations could not foresee this heavy tax upon them in it, is not just to ask them to stand it. There is another element in the cost of making that I have not mentioned. It is in the question of yields. Some factories have an average yearly churn yield as low as 4.20, others run as high as 4.80. It will at once be seen that here is an element or factor that must enter largely into the cost of making. Then, too, there is the question of the ice and its cost. To some creameries this is a very small item. To others it is a very heavy one. Then some creameries can pump their water from a shallow well or perhaps may even have a flowing well, while others may have to pump it one or two hundred feet at an expense as heavy as the running of a separator. Then again one creamery is right at the station and at no expense for hauling to speak of; another creamery at a country point may find this a very heavy and constant tax on the cost of making. While I have suggested some of the more prominent factors that enter into the cost of making, I have no doubt that others will come to your mind and so I will close that others may add their experiences or ideas along this line.

WHOLE MILK VS. HAND SEPARATOR CREAMERY.

BY A. J. HOLMES, OF WILTON.

“Which is to be preferred under existing conditions for the manufacture of butter—the whole milk system or the hand separator cream gathering system?”

This is a subject causing a great deal of talk and worry among buttermakers and creamery men at the present time, and as I have been asked by our worthy Secretary to try to bring out a few points for discussion, will say I prefer the whole milk system. For one reason a superior grade of butter can be made from it. I will try to mention some of the reasons why this is

true.' Under the whole milk system milk is delivered every day and in most cases in fairly good condition. While the cream from hand separators is delivered not oftener than every other day in summer and very frequently not oftener than once a week in winter. This cream comes in all conditions from sweet to some of it being actually mouldy on top before it leaves the farm—not giving the least chance for the buttermaker to show his skill in developing good flavors. The only thing that is left for him to do is to try to get rid of some of the smoked ham, cooked cabbage and onion flavors the cream has already developed from being kept in the kitchen, and very often we find the separator, cream cans, and in fact all utensils used in handling this very delicate product, stored in a vacant stall of the cow stable, which gives the cream a flavor that is very difficult to overcome.

Again we find separators being washed but once a day and occasionally one (I am glad to say I have not found many) being washed once in two days, merely flushing them out with boiling water after the skimming is done, which cooks the slime from the milk and leaves it right there ready to contaminate the next milk coming in contact with the separator.

Let us now consider the financial part of the subject. In a creamery with one hundred patrons buying, say, two factory-size machines, the first cost is \$1,000, or ten dollars each, while if these patrons all buy hand separators at \$100 each brings the cost up to \$10,000, making a difference of \$9,000 on first cost in favor of the whole milk. And I cannot see where they get compensation for this extra amount of capital invested. We hear a claim that it is less work. Of course it is if the separator is washed but once a day and cream delivered but once a week. If every one does this what are we going to do with the butter? It cannot be sold as a fancy extra.

Again we hear it claimed the hand separator gives better skim milk for the calves. To show how much weight this argument has I will quote Prof. D. H. Otis, of the Kansas experiment

station. During a feeding period of one hundred and forty-two days the six calves fed on sterilized creamery skim milk made a gain of two hundred and fifty pounds per head, while the seven calves fed on hand separator skim milk gained during the same time, two hundred and fifty-one pounds per head.

This shows a difference of one pound per head in favor of the hand separator skim milk calves, which I would call a very small margin to buy one hundred dollar separators on, with veal calves only bringing five cents per pound. If the hand separator has come to stay, as a great many seem to think it has, I see only one solution of the problem, that is, keep the hand separator agents out of your territory and sell the machines yourself, or else these agents must learn that cream cannot be held on the farm longer than whole milk, if we are going to make a first class grade of butter.

I do not contend that good butter cannot be made from hand separator cream *if* it is run through a clean separator and cooled down to a low temperature and delivered to the factory in a sweet condition, but this is a grade of cream that we very seldom find—under existing conditions.

THE WHOLE-MILK CREAMERY, THE HAND SEPARATOR CREAMERY, AND THE SKIMMING STATION.

BY A. L. PARMAN.

Mr. Parman addressed the convention as follows:

Ladies and Gentlemen: I am really not prepared today. Two weeks ago when I received a letter from our worthy Secretary, I partially accepted; I told him that I did not know whether I would be here or not. I am leading a pretty busy life with my real estate business and a little creamery business, but I did find time to come here; I am going to say what I can about the hand separator creamery. We all know and agree, I think, that the

whole-milk creamery can make the best article and with the hand separator creamery for the last year I have had considerable experience and have not found it very profitable.

I am not going to run down any particular make of machine, but it is the principle alone of the thing. We have had trouble with what we call or term a self emptying machine, but it is the principle under which they are sold.

Now I know of men who are selling these machines, who go to a man and sell a machine and say that we have got a machine where the cream comes out on top and the milk below; when you are through with it run a little hot water through it and it is all washed. Now I know of machines that are not washed oftener then once a week; now what can a man make out of that filth that comes out of that? I can take you through Sauk county and show you one hundred of these machines and they are not washed oftener than once a week. Now I wish that every sub-agent and agent that told a man that, had one of those machines hung around his neck until he took back everything that was said by him about not washing separators.

Last fall down here at Milwaukee, at the National Convention, I stopped at the Blatz and overheard a conversation with a gentleman, one manufacturing man and myself were there and a buttermaker, he was trying to give him an agency for one of these machines. "This machine," he says, "I claim is the best machine on the market, the milk comes out below and the cream on top. After you are through you run a little hot water through and it will be alright. I think it the only machine on the market." That is what he told the man, but it is no good.

Now I do not know any remedy for this unless we just go before the legislature and the dairymen's association and get 1,000 creamery inspectors, put the state full of creamery inspectors who have the right to inspect and wash each machine, leaving a ticket on the machine stating that you have washed it. We have tried it over there to educate these farmers, but it is impossible to try and hold them and your business too. Generally they are careless in taking care of their milk and machinery.

Now what are we going to do? Now if I won't take that cream the next creamery man comes along and says I will take that cream, I can take anything. Now what am I to do when I go to that man and say I won't take that cream and another comes along and says I will take it. That is about all I have to say, the other two eloquent gentlemen have not touched that point at all. I have had a little experience in that line and it is pretty expensive so far as my experience has gone. I find hand separators are all right if they are handled alright and a good product can be made or manufactured that way, but as it will be with Thomas, Dick and Harry going around the country telling them this and that; if they will only take and wash them everything will be all O. K.

SOME OF THE ADVANTAGES AND DISADVANTAGES OF WHOLE-MILK CREAMERIES.

BY M. H. GARDNER, OF DARIEN.

Mr. President, Ladies and Gentlemen: I do not know that the mere Secretary of a Creamery company has any real standing in a buttermakers' convention; so I will say at the start that I do not come here, on the invitation of your able Secretary, to instruct, but have written this paper, on some of the advantages and disadvantages of the whole-milk creamery, merely to aid in getting the matter before the meeting for discussion. It is something which ought to have been written by an active buttermaker, for his convention is hardly the place to put forth any argument resting on theory; but I will say that my observations have been helped by the fact that I was an expert buttermaker in my younger days, and, under the old dairy system, able to make butter selling for 32c per pound by the year to city customers. For many years I have been secretary of the Darien

creamery, a medium sized, very successful creamery, with a \$5,000 plant; so I have kept well in touch with butter and buttermaking.

It is generally admitted that the proof of the pudding is in the eating; so, likewise, a buttermaker's skill is measured by the quality of the goods he turns out. The average buttermaker usually stands between the Devil and the deep-sea,—between the patrons who furnish the milk or cream, and his employer or employers, who are often these same patrons. He is expected to be a sort of necromancer, who, by touching any quality of milk or cream with the magic wand of his skill, can evolve from it the finest quality of butter, which shall grade and sell as "extras;" and if for any reason he is unable to do this, he is declared a fraud and a failure. As I understand it, the object of the discussion today is to determine which of three methods of getting the butter-fat of milk into the buttermaker's hands is economically best; for by that method, whichever it may be, the milk will bring the highest price to the producer. If, incidentally, this method could also be made best for the buttermaker, we should have the ideal system; and that is the system we are looking for. In my own opinion we are in a transition stage, and are going back eventually to the old cream-gathering plan, with farm separator attachment; for I believe that this system will eventually prove most profitable to the producer, and whatever plan accomplishes that object wins. But I also think that there will be need of much teaching before the average creamery patron will be apt to follow this plan successfully.

The main advantage that I see in the whole-milk creamery at the present time is that the system, by placing the milk more directly under the control of the buttermaker, is conducive to the production of the best quality of butter. The producer is always more or less a judge of milk, and it is an easier matter for the buttermaker by smell and taste to point out its defects, and so educate the producer; and when such a man finds that his milk is sometimes rejected, or at least not satisfactory, and has

the reason explained to him, he will in most cases try to do better. Thus, the whole-milk creamery is a school, with the buttermaker as instructor, with whom the patron or his agent comes in daily contact; and the hint dropped here and there, or the wise word spoken in season, will slowly but surely affect the whole community. You all know that there are some men who have to be hit with a club before they can take a hint; and a buttermaker must use his discretion in such cases. I well remember the regeneration of one of my neighbors nearly 30 years ago, when the first cheese factory was started at Darien. The cheesemaker, who was also proprietor, and had seen his month's make of cheese cut 2c per pound in price on account of their peculiar flavor, lost his usual suavity and told him with a good many blanks that unless he could bring milk to the factory that did not have to have the last quart or two in each can poured out on the other side of the wagon, he need not trouble himself to bring any more. The medicine was harsh but effective. I think that one of the main advantages of the whole-milk creamery is in the bringing of patron and buttermaker into closer relations.

While it was not my intention, in getting down these thoughts, to be specific but rather suggestive, leaving such matters for the discussion, allow me to turn aside for a moment to express my hearty commendation of Mr. Anderson's words last evening as to the necessity of the buttermaker being thoroughly fitted for his profession, I might almost say art. It used to be said that buttermakers, like poets, were born, not made, but that was when buttermaking was largely intuitive and there was little or no chance for getting instruction; but now all that is changed and there is no excuse for a buttermaker to be incompetent. Your work is supplemental to that of the milk producer, and therefore you must not be ignorant of his work; for your calling forces you into the position of instructor, and the blind make poor leaders for the blind. Most of you come from the farm and have there learned something of the underlying

principles of milk production, but you have only a smattering of such knowledge, and in order to visit your patrons in their homes, as you should, and to talk intelligently with them, you must thoroughly post yourselves on feeds and feeding.

In your own particular line there is no excuse for ignorance; the state is doing much and it will do more if you deserve it. Not only the state but the nation is proud of the corps of instructors at Madison. They will gladly teach you what is known, and will find out, as far as they can, all that is knowable; for they are not only teachers but are students themselves. With such advantages then, as Wisconsin offers to her buttermakers, there can be no excuse for the close relations of buttermaker and patron not being highly beneficial to the latter.

When the milk has been delivered, and the patrons are awaiting each his turn for the skim-milk, they are brought into close contact with one another; and in the discussions carried on, there is much to stimulate and encourage. Patron Smith is usually anxious to know how Jones, with just the same number of cows as he milks, can get a monthly check 25 per cent. larger than his; while Brown is inquisitive to know if it is Tompkins' silage that enables him to bring six cans of milk now, when he used to bring but four. Thus, quantity and quality of milk; breeds and breeding of dairy-cattle; feeds, feeding and general care—all are discussed, and, mixed with the usual neighborhood gossip, a miniature farmers' institute is in session every morning. This is all beneficial to patrons and to creamery. Another point is that the patron takes a greater interest in the success of the creamery the closer he is brought in contact with it; and that his daily visits to the creamery affect him in a vastly greater degree than would the daily visit of the cream-wagon to his farm.

The influence of the whole-milk creamery on the matter of good roads can hardly be overestimated, and I know of nothing that will convert a narrow, close-fisted, unprogressive man to the

good roads idea quicker than to have to draw his milk in all weather to the creamery for 365 days in the year; especially if he breaks down now and then, and has a good sized repair bill to pay. The broadening of a man's ideas even on the matter of good roads prepares him for further advances in the creamery business; it is a part of his education.

There are two great disadvantages in the whole-milk system to be mentioned,—the carting of the skim-milk both ways, and its quality. As to the latter, the main fault has been in the adding of water to make it hold out; and in the winter season, which is the only time of the year when it can be used to advantage for calf-feeding, there is the trouble of warming it. The Darien creamery is co-operative to the extent of making the butter for all patrons on the same basis; but it is, strictly speaking, a pure stock company. At the start, the Board of Officers determined that there should be no water added to the skim-milk; and we knew that the patrons would not divide it equitably among themselves. We did not wish to bother with milk-weighers, check-pumps and other like methods, on account of the time wasted, and so hired a man for \$12 per month, to be on hand each morning for 3 hours to divide the milk. It is now the 8th year of this system, and our patrons will have no other; it saves their own clothes, and they can send wives or children with the milk if they so desire; while the man becomes expert in the filling of cans, saving time, and not sloping everything up. The skim-milk vat is like the receiving vat, only much smaller, and is kept just as clean; and all butter-milk, as well as any skim-milk left on hand, goes into the buttermilk tank. So, during the winter or cool season at least, our plan furnishes the skim-milk in fairly good condition; though there is the trouble and expense of warming it. I am a breeder of Holstein-Friesian cattle, and am considered to have one of the best herds in the state; but my calves are raised on this skim-milk, and I have not sold one in two years for less than \$100. Of course, I would prefer the warm skim-milk from the farm

separator, and only mention the matter to show that creamery skim-milk need not be necessarily altogether bad.

But the carriage of the skim-milk both ways! there is where the rub comes in the present system. I made a careful computation of the average cost of this cartage at our creamery, and am firmly convinced that 2c per pound butter-fat is rather below than above actual cost to our patrons; which would be about 2 1-3c per pound of butter made. In addition to this I found that if the cream could be delivered into our cream-vats in as good condition as we now get it there, there would be an average saving of a trifle over two-thirds of one cent per pound butter made, in our expense bills; so that with us the whole-milk system costs for the delivery of the whole milk fully 3 cts. per pound for every pound of butter made, and in addition the fuel used and trouble in warming the skim-milk for calves in winter. I raise calves in the cool season, and in summer feed the milk to Poland-China pigs; for in warm weather it can only be kept sweet a few hours after getting it home. The question then is as to whether it would be better for our patrons to change this system. There would be a saving per average cow of fully \$5 on milk-delivery, and I am sure that the increased value of the skim-milk could not be less than 5 cents per 100 pounds, or \$2 per average cow more; or taking both savings together, \$7.00 per average cow. Out of this would have to come the cost of cream-delivery; the loss of the butter-milk, unless some plan of utilizing it for pig-feeding near the creamery could be put in practical operation; and any loss that might ensue through the making of a lower grade of butter.

It is this last clause that troubles me. A buttermaker has it hard enough at the best; and when I think of his being required daily to turn out a uniform product of butter of the highest grade from a mixture of 100 different lots of cream in 100 different stages of ripeness, to say nothing of the possibility of 100 varieties of flavor and degrees of cleanliness, I am at a loss. The only hope of uniformity in

such cream production that I can see will come from education and training; for, as I mentioned before, that plan of getting the butter-fat into the butter-maker's hands which pays best to the milk-producer is the most desirable, and must win in the end, even though the butter turned out under it be not of the highest quality; and the buttermaker should make it his main object to so educate his patrons in the production of butter-fat, that the plan which is most economically productive for them shall also be conducive to his turning out the very highest quality of butter.

HOW THE PRIZE BUTTER AT THE NATIONAL WAS MADE.

BY E. L. DUXBURY OF GREEN BAY.

Mr. President, Fellow Buttermakers and members of the Wisconsin Buttermakers' Association: I must confess that I was taken somewhat by surprise when I received a letter from our secretary asking me to write a paper for this convention. I consented (although I must say a little reluctantly) as I had never done such a thing before, neither had I ever expected to, so you must excuse me if I don't make it interesting for I assure you I would rather make a batch of butter than write a convention paper. If you will go with me five miles to the northwest of the city of Green Bay in the town of Howard you will find a common every day creamery such as we see while passing through the country. We have here all kinds of soils from the low swampy land which extends for two or three miles back from the west shore of Green Bay to the heavy clay soil on the higher grounds, to the light sandy soil farther back. This soil produces feed and pasturage of most every description that is common to most every community from the leak on the low grounds in the spring the wild prairie grasses and the rich

sweet clover and timothy on the dryer grounds, and I must not forget to include the cabbage that nature meant for the making of sauerkraut but never intended for the production of good butter. Of the former I am glad to say that I am seldom bothered with. But the latter is a constant source of trouble from the first of September till late in the winter as many of my patrons will store them away in their root houses cellars or barns for winter feeding especially if the price is low in the fall as it was this year. The farming section here varies, the portion nearer the city being mostly cut up in small farms from 10 to 20 acres and devoted mostly to gardening, keeping only two or three cows, this gives me a large number of small patrons. While farther back the farms are larger having more cows and raising crops common to all farming communities, quite a large amount of fodder corn for winter feeding is raised.

Our creamery was built during the winter and spring of 1900 starting to run sometime in April. During the following two or three months considerable trouble was met with. It would run for a few days or a week then close for repairs or a new buttermaker.

The 2d of July, 1900, they engaged my services. Arriving there on the 7th I found the factory closed and a discouraged set of stockholders, but we have not lost a day since. The first summer we received about 6000 lbs. of milk per day during the flush of the season, while last season I received 11000 and expect it will reach 14000 or 15000 lbs. the coming season. In the last ten months from April 1st, 1902, to February 1st, 1903, we have received 1,919,319 pounds of milk with an average test 4.148 making 77,801 pounds of butter fat or 90,110 pounds of butter, and have sold 2,042 lbs. of cream; paying an average for the ten months of 22.41 cents for butter fat.

Our secretary also wishes me to tell how I made the prize butter at the national convention. It will be impossible for me to give it exactly as I had not the slightest idea of winning so did not take care of my duplicate as I should have done.

Nevertheless I will try and give you a plan of the summer's daily work which will come very close to the work of that day as I tried to follow the same methods each day varying with the conditions of milk and temperature from day to day. In the first place I am very particular about taking in the milk, if any is sour, tainted or off flavor it is rejected and if the patron is not there himself I write a note stating the defects and asking him to be more careful in the future. The milk was heated with a Curtis heater at a temperature of about 74 degrees, was skimmed with a Alpha separator, ripened in an open vat at 68 degrees or 70 degrees, and used a home-made starter made from the whole milk. I stirred the cream occasionally during the forenoon. After leaving it at noon no more attention was paid to it till about 5:30 in the evening when it was cooled down to about 52 degrees and let stand until 4 o'clock the next morning when it was churned in a Disbrow churn using 3-4 oz. W. R. color to 1000 pounds of milks and 7 lbs. D. C. salt to 100 pounds of butter. The butter was worked for 5 minutes by the watch or about 25 revolutions of the churn. The butter was washed through two waters at a temperature of 48 degrees before salting and worked at once and packed into 63-pound tubs. This may not be the best method of working but I find it has given me very good success. The 6 months' contest was the first contest I ever entered with the exception of our State and Dairyman's Conventions last year and the Dairyman's this year at Fond du Lac where I received a score of 97. As I never attended a Dairy school I owe much of my success to the careful study of my Dairy Journals and the educational test.

DISCUSSION.

Mr. Allen: I would like to ask him if he had any hand separator cream?

Mr. Duxbury: No, I did not.

The President: As this completes our program for today we will now listen to the report of the Committee of Resolutions.

Report read.

The President: The next will be the report of the Committee on By-Laws.

Report read.

The President: The next will be the report of the Executive Committee on the Treasurer's accounts.

Committee reported that they have audited the accounts and found them correct.

The President: The time has now come to nominate and elect new officers of this association for the coming year. At this time I wish to state that I am not a candidate. I have served this association for the last two years and feel that it ought to be passed around. Gentlemen, nominations are in order.

Mr. Parman: I will nominate for president Mr. J. G. Moore of Albion.

Mr. Dixon: I will nominate our present president Mr. F. B. Fulmer a man who has made us a good president and I think entitled to a third term under our new constitution.

President Fulmer: I must decline a third re-nomination.

Mr. Duxbury second the nomination of Mr. Moore.

Mr. Green: I would move then that Mr. Moore be unanimously nominated for president of this association for the ensuing year.

Mr. Dixon: I withdraw the name of Mr. Fulmer and move that Mr. Moore be elected by acclamation.

Motion seconded by Mr. Duxbury. Motion carried and Mr. Moore declared the duly elected president for the ensuing year.

The President: Ladies and Gentlemen, Members of the Wisconsin Buttermakers' association, I take great pleasure in introducing to you your new president, Mr. Moore.

Mr. Moore: This honor which you have conferred upon me I have no doubt will rest very heavy upon my shoulders and hope that you will assist me in order to uphold the record that

has been made in the position. I can very readily see that it will be demanding a great deal of my time and energy and it will be my desire as I go around and visit the creameries to say a good word for our association and try to increase its membership and to further the work that has been commenced. I thank you very much.

The President: The next will be the election of a vice-president.

Mr. Moore: I would like to nominate for that position a man who as a man and as butter-maker has a record, that is W. J. Hyne of Evansville.

Mr. Michaels: I second the nomination.

Mr. Dixon: There being no further nominations I would move you that Mr. Hyne be elected by acclamation.

Motion carried and Mr. Hyne was declared elected.

The President: Mr. Hyne come forward. Ladies and Gentlemen allow me to introduce to you Mr. Hyne the newly elected vice-president.

Mr. Hyne: I would rather make butter than make a speech; of course if I must make a speech I will just say thank you.

The President: We will now proceed to elect a secretary.

Prof. Farrington: I will place in nomination Mr. F. B. Fulmer as Secretary of this association.

Seconded by Mr. Moore and Mr. Duxbury.

Moved and seconded that the rules be suspended and that F. B. Fulmer be elected by acclamation. Motion carried.

Prof. Farrington: All those in favor of Mr. F. B. Fulmer for secretary will say aye. Motion carried and Mr. Fulmer declared elected secretary.

Mr. Moore: I will place in nomination for the office of treasurer, Mr. E. C. Dodge of Lake Mills.

R. C. Green: I will nominate Mr. Michaels.

Seconded by Mr. Duxbury.

Mr. Michaels: I withdraw my name from before the convention and second the nomination of Mr. Dodge.

Mr. Green: There being only one candidate before the convention, I move that the rules be suspended and that Mr. Dodge be elected by acclamation. Motion carried and Mr. Dodge is elected by acclamation.

Mr. Michaels: I will nominate R. C. Green of Albion as a member of the executive committee for one year.

Prof. Farrington: I second the nomination.

Mr. Dixon: I move you that Mr. Green be elected by acclamation.

Motion carried and Mr. Green elected by acclamation.

Mr. Dixon: I will nominate Mr. A. L. Palman as a member of the executive committee for two years.

Mr. Dodge: I second the nomination.

Prof. Farrington: I move you that Mr. Palman be elected by acclamation and that the rules be suspended.

Motion seconded and carried and Mr. Palman elected by acclamation.

Mr. Moore: I will place in nomination the name of G. B. Windsor as a member of the executive committee for three years.

Mr. Duxbury: I second the nomination of Mr. Windsor.

Moved and seconded that the rules be suspended, and that Mr. Windsor be elected by acclamation. Motion carried and Mr. Windsor was elected by acclamation.

The President: We will now take up the report of the Committee on By-laws.

Report of the Committee on By-laws read.

It was moved that the report of the Committee on By-laws be adopted. Motion carried.

The President: We will now take up the report of the Committee on Resolutions.

Report of the Committee on Resolutions read.

We, the Wisconsin Buttermakers' Association, assembled in this, our second annual convention, at Waukesha, February 24, 25 and 26, 1903, do adopt the following resolutions:

Resolved, That this association tender their hearty thanks to the officers upon whom devolved the work of preparation for this convention, and whose efforts were crowned with success; to the city of Waukesha, its Mayor and the business men associated, as the "Six to Ten Club," for their help in the arrangements for the convention; for the music furnished, and for other assistance.

Resolved, That we tender the thanks of this association to Mr. W. D. Collyer, judge of the butter entries, who gave his time to discussing personally, with the maker of each entry present, with the faults found therein, and thereby helped instruct each in the scoring of his own butter, and to Prof. E. H. Farrington, who served with the judge and gave personal advice to the exhibitors as to how to overcome the faults noted by the butter judge.

Resolved, That this association indorse and lend its aid to the holding of the six months' educational butter contest, as conducted by the National Buttermakers' Association, with the assistance of the United States Department of Agriculture.

Resolved, That we return our thanks to the officers of the National Dairy Union, as a partial expression of our appreciation of their untiring and able efforts in behalf of the dairy men and honest butter, in securing the passage of the National Oleomargarine Law of 1902.

Resolved, That we also extend our hearty thanks to our United States Senators and Representatives in Congress for their loyalty and hearty assistance in securing the passage of the aforesaid law.

Resolved, That the Wisconsin Buttermakers' Association demands that all imitations of and substitutes for dairy products shall be put upon the market under appropriate names, free from incorrect or misleading appellations or markings, and in such manner that purchasers and consumers may readily distinguish and recognize them as imitations or substitutes; and they especially protest at this time that renovated, clarified and

re churned butter cannot with any propriety be denominated "Process Butter," as though it was freshly made by some new and improved process, and should not be permitted to assume that or any other name or designation that does not clearly and unmistakeably indicate its origin and character, and differentiate it from the regular product of creameries and dairies.

Resolved, That this association unreservedly approves the legislation of Congress and the regulations prescribed by the Secretary of Agriculture relating to the manufacture and sale of "Renovated Butter" as being just and right, conducive to commercial integrity, and in restraint of deceit and false pretenses.

Whereas, It is with unspeakable pleasure that we have listened to the vocal selections by Mr. Jules Lombard, therefore be it

Resolved, That this convention express its thanks by a rising vote.

Resolved, That we note with deep regret that circumstances have compelled the absence of Ex-Governor W. D. Hoard, and we hereby express our thanks to him for the interest he has manifested in our association, and that he may be with us at our next annual convention.

Resolved, That it be the sense of this convention that the President appoint a committee of three to confer with the State Commission relative to securing a liberal portion of the state appropriation for the dairy exhibits at the Louisiana Purchase Exposition to be held in St. Louis, Missouri, in the year 1904.

Resolved, That this association re-endorse Mr. E. Sudendorf for the office of Dairy Superintendent of the Louisiana Purchase Exposition, and urge upon the managers of the Exposition our request for his appointment to that position.

Resolved, That a copy of this resolution be forwarded to the authorities in charge of said Exposition.

Resolved, That the President appoint a committee of three to interview the proper members of the State Legislature

relative to the various bills before said Legislature affecting the dairy interests of this state and urge upon them the necessity of passing the said bills at their earliest convenience.

Resolved, That this association earnestly requests the Legislature of Wisconsin to enact into law the bill now pending "to provide an assistant chemist, and additional food, milk, dairy, cheese factory and creamery inspectors, for the dairy and food commission."

Resolved, That this association hereby urges the state legislature to consider favorably the providing for and the appointment of at least three competent creamery inspectors, who shall be under direction of the State Dairy and Food Commissioner.

Resolved, That this association, in convention assembled, does hereby sanction all steps taken by our officers in incorporating the Wisconsin Buttermakers' Association under the state laws, and be it further

Resolved, That we hereby accept their action as our own, and mutually pledge ourselves to transfer our memberships and interests to the incorporated association.

Resolved, That all the accounts, records, funds, etc., of the present association are hereby transferred to the incorporated Wisconsin Buttermakers' Association.

J. Q. EMERY, *Chairman*,

H. B. J. ANDRUS,

W. A. STEWART.

It was moved and seconded that the resolution in regard to Mr. Jules Lombard be adopted by a rising vote. Motion carried, resolution adopted.

Moved and seconded that the balance of the resolutions be adopted as read. Motion carried, resolutions adopted.

The President: The Secretary will now read the names of the parties receiving the highest butter score.

The Secretary: The highest score was received by J. G. McIntyre of Whitewater, the second highest score was received by J. G. Hyue of Evansville.

Discussion on the advisability of giving the gold medal to Mr. McIntyre, he not being present.

Mr. Moore: I move you that the vote on the by-laws be reconsidered.

Motion seconded by Prof. Farrington.

Motion carried.

Prof. Farrington: I move you that that portion of the by-laws relating to the awarding of the medals be amended or changed; so that the man who receives the highest score will receive the gold medal.

Mr. Michaels: I second the motion.

Motion carried.

Mr. Moore: I would move you that the by-laws be adopted as amended.

Motion seconded by Prof. Farrington.

Motion carried.

The President: I wish to thank the various machine men for the machinery exhibits and for their cordial support. Without your assistance such conventions as this would not be practical. Before we close I wish to make a few personal statements. As perhaps many of you know we have a bill before the state legislature to secure an annual appropriation. We would like to have all of you go home and bring all the influence to bear that you can on your representatives at Madison. So far as I have any influence I will use it the best I know how. I must say that it has not been easy for this association to solicit contributions for the premium fund. We will probably come around and ask for your ad. In taking an ad. in the program, if we are successful in securing an appropriation large enough to carrying on our work, it is our hope, and probably will be our policy, never to ask any one for any contributions. Remember, I state this conditionally. I hope that the result will be such that we will not have to ask to contribute to the premium fund again. With many thanks for the spirit in which you have supported me, I now declare this convention adjourned without date.

BUTTER EXHIBIT.

List of Butter Exhibitors Scoring 90 Points or More—1903.

NAME.	ADDRESS.	SCORE.					FOR SPECIAL PREMIUM.							
		No. of Exhib.	Flavor.	Body.	Color.	Salt.	Pkg.	Total.	Sepa- rator.	Starter.	Ripen- ing vat.	Churn.	Color.	Salt.
Black, C. O.	Deerfield.....	6	38	25	15	10	5	93	Alpha.	Whole milk.	Open.	Victor.	Ald.	W.
Boetcher, J. E.	Guthrie.....	7	42	25	15	10	5	97	Tab.	Hansen.	Twin.	Victor.	Ald.	D. C.
Blumenstein, F.	Sullivan.....	9	37	25	15	10	5	92	Hand.	D.	Twin.	Box.	W. & R.	W.
Bowman, H. S.	Sauk City.....	10	36½	25	14	10	5	90½	Alpha.	Milk.	Open.	Victor.	W. & R.	W.
Boss, Frank	Madison.....	11	40½	25	15	10	5	95½	Alpha.	D.	Open.	Wizard.	W. & R.	D. C.
Berkholz, H.	Edgerton.....	12	35	25	15	10	5	94	S.	Com.	Open.	Wizard.	W. & R.	D. C.
Buchanan, Wm.	Whitewater.....	13	39½	25	15	10	5	94½	Alpha.	Com.	Open.	Box.	W. & R.	W.
Bjerregaard, R. P.	Green Bay.....	14	40	25	14	10	5	94	R-id.	Com.	Open.	Disorow.	Ald.	Gen.
Boss, F. W.	Beyden.....	15	38½	25	15	10	5	95½	Alpha.	Com.	Open.	Disorow.	Ald.	Gen.
Burrill, D. R.	Burlington.....	17	37	25	15	10	5	92	Alpha.	Hansen.	Open.	Disorow.	Ald.	W.
Basst, Jos.	Stockbridge.....	18	36	25	15	10	5	91	Alpha.	D.	Open.	Victor.	W. & R.	W.
Benson, S. L.	Fennimore.....	19	36	25	15	10	5	91	Alpha.	D.	Open.	Victor.	W. & R.	W.
Chapin, C. J.	Omro.....	21	27	25	15	10	5	92	Alpha.	D.	Open.	Victor.	Ald.	W.
Covill, A. L.	Nelsonville.....	23	38	25	15	10	5	93	Alpha.	Home made.	Fargo.	Squeezer.	Ald.	Gen.
Cook, J. J.	Burlington.....	24	38	25	15	10	5	93	Alpha.	S. M.	Open.	Victor.	Ald.	W.
Duxbury, E. L.	Green Bay.....	26	40	25	15	10	5	95	Alpha.	Home made.	Open.	Disorow.	Ald.	D. C.
Dasch, E. O.	Ironton.....	27	38	25	15	10	5	93	Alpha.	Home made.	Open.	Victor.	W. & R.	Cad.
Erickson, A.	Volga.....	29	38	25	15	10	5	93	Alpha.	Hansen.	Open.	Victor.	Ald.	D. C.
Eastman, E. L.	Saukville.....	31	35	25	15	10	5	90	U. S.	S. M.	Open.	Victor.	W. & R.	D. C.
Feind, W. J.	Helenville.....	32	39½	25	15	10	5	94½	Alpha.	Hansen.	Open.	Victor.	W. & R.	W.
Gullikson, M.	Cushing.....	34	35	25	15	10	5	90	Alpha.	D.	Open.	Disorow.	Ald.	D. C.
Griffin, H. E.	Hancock.....	35	35	25	15	10	5	90	Alpha.	D.	Twin.	Victor.	W. & R.	W.
Goetz, H. A.	Winthrop, Minn.	37	40	25	15	10	5	95	Alpha.	Hansen.	Boyd.	Disorow.	W. & R.	Gen.
Golz, Edw.	Princeton.....	37	38	25	15	10	5	93	Alpha.	S. M.	Open.	Victor.	W. & R.	W.
Griech, C.	Grafton.....	38	40	25	15	10	5	95	A. & S.	None.	Open.	Victor.	W. & R.	D. C.
Gilbert, H. E.	Alma Center.....	39	39½	25	15	10	5	91½	U. S.	None.	Open.	Victor.	W. & R.	D. C.
Goodechild, L. A.	De Pere.....	40	38½	22	15	10	5	93½	Alpha.	Hansen.	Open.	Disorow.	Ald.	D. C.

Hermanson, Erick H	Northland	41	25	15	10	5	96	Alpha	S. M.	Open	Victor	Ald.	D. C.
Holland, O. E.	West De Pere	45	25	15	10	5	92½	Alpha	Com	Open	Disbrow	W. & R.	D. C.
Henrickson, H.	Morrisonville	45	30½	14	10	5	90½	Alpha	Hansen	Open	Victor	W. & R.	D. C.
Hyne, Wm. J.	Evansville	48	42½	15	10	5	97½	Alpha	S. M.	Open	Disbrow	W. & R.	Gen.
Key, E. L.	Capron, Ill	49	38	25	15	10	83	Alpha	S. M.	Open	Box	Ald.	Gen.
Key, E. L.	Belle Plain	50	38½	25	15	10	83½	Alpha	S. M.	Open	Box	Ald.	Gen.
Jacquith, F.	Dartford	82	39	25	15	10	91	Alpha	None	Open	Victor	W. & R.	D. C.
Kemmer, Chas.	Almana	54	36	25	15	10	94	Alpha	None	Open	Fargo	Ald.	W.
Klokker, A.	Makeson	55	37	25	15	10	92	Alpha	None	Open	Fargo	Ald.	W.
Kohl, E.	McFarland	56	33½	25	15	10	83½	Alpha	Whole milk	Boyd	Victor	W. & R.	Gen.
Kohl, E.	Jefferson	57	41	25	15	10	85½	Alpha	Hansen	Far.	Fargo	Ald.	D. C.
Knoll, H. H.	Johnson Creek	58	40½	25	15	10	85½	Alpha	D.	Open	Fargo	Ald.	D. C.
Koehn, C. M.	Custer	60	38½	25	15	10	83½	Alpha	None	Open	Fargo	Ald.	D. C.
Kuhl, F. W.	Adams	60	38½	25	15	10	83½	Alpha	None	Open	Fargo	Ald.	D. C.
Lee, L. C.	Hanover	62	40	25	15	10	95	Alpha	Home made	Far.	Box	Ald.	W.
Lawrence, P. L.	Gibson	63	36	25	15	10	91	Alpha	Home made	Open	Victor	W. & R.	D. C.
Lester, W. H.	Albion	64	38	25	15	10	93	Alpha	S. M.	Far.	Victor	W. & R.	D. C.
Miller, R. C.	Marshall	66	39	25	15	10	94	Alpha	R. M.	Open	Victor	W. & R.	W.
McConnell, F. E.	Almond	67	39	26	15	10	91	Alpha	Home made	Open	Victor	Ald.	W.
McVey, G. G.	Whiteville	68	43	25	15	10	98	Alpha	Hansen	Open	Victor	Ald.	D. C.
Mitchell, E. C.	Dodgeville	69	35	25	15	10	90	Alpha	D.	Open	Victor	Ald.	D. C.
McAdam, W.	Vernon	72	39	25	15	10	94	Alpha	D.	Open	Victor	W. & R.	Gen.
Melane, A.	Whitewater	73	37	25	15	10	92	Alpha	D.	Open	Victor	W. & R.	Gen.
Nelson, P. D.	Plover	75	42	25	15	10	97	Tub	Home made	Open	Disbrow	Ald.	Gen.
Quirk, J. C.	Burlington	77	42	25	15	10	97	Alpha	S. M.	Open	Wizard	Ald.	W.
Stebler, A. W.	Brothertown	81	40	25	15	10	95	Alpha	Kieith	Open	Victor	Ald.	W.
Stewart, W. A.	Eagle	82	38	25	15	10	93	Alpha	Whole milk	Open	Victor	W. & R.	Gen.
Schirmer, Jos	Wales	83	36	25	15	10	94	Alpha	Hansen	Boyd	Victor	Ald.	W.
Stryker, J. W.	Lomira	84	36	25	15	10	91	Alpha	S. M.	Open	Victor	W. & R.	W.
Trager, Gust.	Mazomanie	88	36	25	15	10	91	Alpha	None	Boyd	Box	W. & R.	W.
Thompson, A. E.	Poplar Grove	89	39	25	15	10	94	Alpha	Whole milk	Open	Victor	W. & R.	W.
Tomblinson, H. E.	Navan	90	41	25	15	10	96	Alpha	Home made	Open	Victor	Ald.	D. C.
Jordan, G. E.	Amberst.	92	41½	25	15	10	96½	Alpha	Home made	Open	Victor	Ald.	D. C.
Van Dreser, M. L.	Bloomer	94	38½	25	15	10	93½	Alpha	Hansen	Open	Victor	Ald.	D. C.
Weber, J. C.	Fond du Lac	98	37	25	15	10	92	Alpha	Home made	Boyd	Victor	W. & R.	D. C.
Weaver, A. E.	Darlen	98	39	25	15	10	94	Alpha	Hansen	Open	Box	W. & R.	Gen.
Weber, J. F.	Harford	100	38	25	15	10	93	Alpha	Home made	Open	Victor	W. & R.	D. C.
Whitney, R. C.	Pay Sippi	101	37½	25	15	10	92½	Alpha	D.	Open	Victor	W. & R.	W.

TREASURER'S REPORT.

GENERAL FUND.

RECEIPTS.

Balance from last year.....	\$68 35
Membership fees.....	237 00
National parade prize.....	50 00
Advertising in program.....	195 00
City of Waukesha	100 00
Miscellaneous receipts.....	34 79
Total.....	\$685 14

EXPENSES.

Printing programs, postage, etc.....	\$119 43
Score cards.....	1 50
Painting signs.....	4 50
Hotel bills of speakers.....	4 50
Medals.....	22 00
Badges.....	25 00
Traveling expenses of executive committee and officers.....	95 97
Expenses of M. H. Gardner.....	8 96
Miscellaneous expenses.....	33 76
Freight.....	1 11
Total.....	\$315 73
Balance on hand.....	369 41
Total.....	\$685 14

BUTTER ACCOUNT.

Received for butter.....	\$444 70
Paid express, membership fees, etc.....	131 26
Balance to next premium fund.....	\$313 74

CONTRIBUTORS TO THE PREMIUM FUND.

Sale of Butter (last year).....	\$273 62	International Cream Separator	
Creamery Package Mfg. Co.....	\$25 00	Co	10 00
DeLaval Separator Co.....	25 00	Farnsworth, Benjamin & Mills,	
Wells & Richardson Co.....	25 00	Boston.....	10 00
Vermont Farm Machine Co.....	20 00	Chapin & Adams, Boston.....	5 00
Cornish, Curtis & Green Mfg. Co....	15 00	Pitt, Barnum & Co., New York....	5 00
National Creamery Supply Co.....	15 00	Gude Bros., New York.....	5 00
A. H. Barber Mfg. Co.....	15 00	James Butler, New York.....	5 00
Worcester Salt Co.....	15 00	Francis D. Moulton & Co.....	5 00
Diamond Crystal Salt Co.....	15 00	John S. Morris & Co.....	5 00
Wisconsin Dairy Supply Co.....	10 00		
Empire Cream Separator Co.....	10 00	Total to date.....	\$523 62
Rogers & Sullivan, Boston.....	10 00		

