Twentieth annual meeting of the Wisconsin Cheese Makers' Association held in the Convention Room, Republican House, Milwaukee, Wisconsin, Wednesday, Thursday and Friday, January 10, 11 and 12, 1912. ...

Wisconsin Cheese Makers' Association
Madison, WI: Democrat Printing Co., State Printer, 1912

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EXCHANGING INFORMATION

TWENTIETH ANNUAL MEETING

OF THE

WISCONSIN

CHEESE MAKERS' ASSOCIATION

HELD IN THE

Convention Room, Republican House, Milwaukee, Wednesday, Thursday and Friday, January 10, 11 and 12, 1912

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

Compiled by

U. S. BAER, Secretary.

MRS. M. G. CARPENTER, Stenographic Reporter.

MADISON, WISCONSIN
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1912

ILLUSTRATIONS.

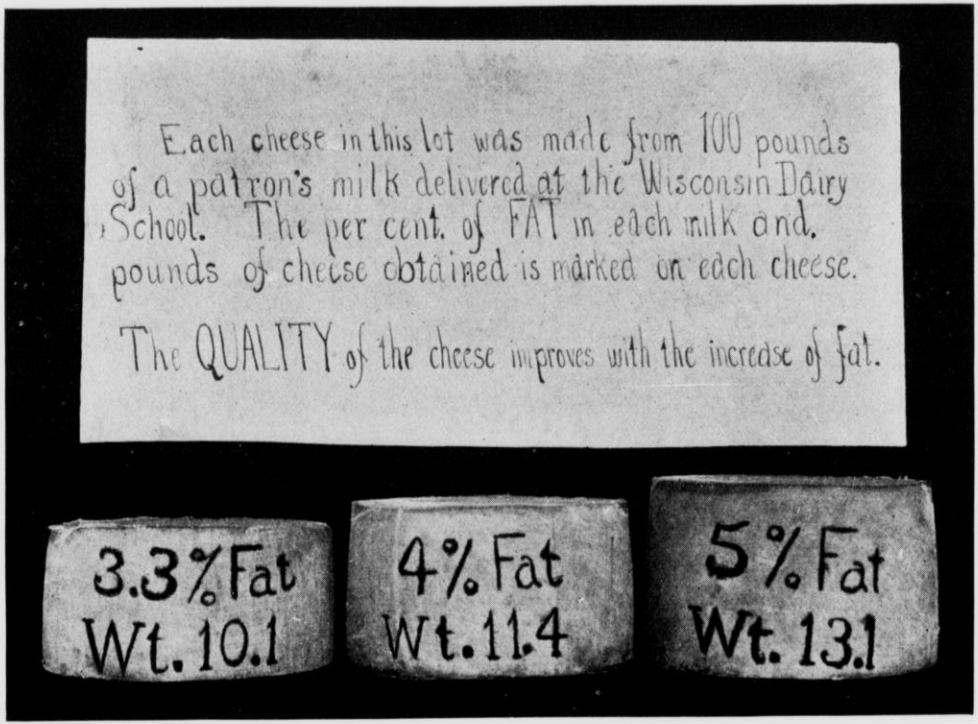

PLATE NO. 1—THE VALUE OF FAT IN THE MILK FOR CHEESE.

The cheese shown here demonstrates the value of fat in the milk for cheese. The weights given were as taken from the press and the cheese were made soft for a local market, so that these figures are somewhat higher than for cured cheese for the ordinary market. The point to be noticed is that rich milk makes more cheese than poor milk.

LETTER OF TRANSMITTAL.

Office of the Secretary,
Wisconsin Cheese Makers' Association,
Madison, Wis., 1912.

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

I have the honor to submit the twentieth annual report of the Wisconsin Cheese Makers' Association, showing the receipts and disbursements the past year, also containing the papers, addresses and discussions had at the annual convention held at Milwaukee, January 10–12, 1912.

Respectfully submitted,

U. S. BAER,
Secretary.

OFFICERS, 1912.

JOHN B. McCREADY, President ..... Marshfield, Wis.
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MRS. ALMA B. ROUMP-FISH ..... Madison, Wis.

OFFICIAL ORGAN.

SHEBOYGAN COUNTY NEWS AND DAIRY MARKET REPORTER..
Sheboygan Falls, Wis.

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REPORT OF SECRETARY

TO THE STATE BOARD OF PUBLIC AFFAIRS.

Following is a report that was made to the Secretary of the State Board of Public Affairs, in response to his request, January 15th, 1912.

This report is published with the approval of the State Board of Public Affairs.

U. S. BAER,
Secretary.

MR. ROBERT A. CAMPBELL, Secretary,
Wisconsin State Board of Public Affairs,
Madison, Wisconsin.

Dear Sir: In response to your request of January 15th, 1912, that I submit to you a brief report showing the demand that created the Wisconsin Cheese Makers' Association, the law that provided for it and the work that the Association has been able to do under the law, I respectfully submit the following.

The Wisconsin Cheese Makers' Association was organized March 23rd, 1893 and was incorporated February 2nd, 1899, under the provisions of chapter 86 of the statutes of 1898.

The objects of the Association are set forth in Article I, of its Articles of Incorporation as follows:

"ARTICLE I.—The undersigned have associated and do hereby associate themselves together for the purpose of forming a corporation under chapter 86 of the Wisconsin statutes of 1898, and the acts amendatory and supplementary thereto, the business, purpose and object of which corporation shall be the education of its members for better work in the art of making cheese, the care and management of factories, the sale of their products and the weeding out

of incompetency in the business of cheese making; the further object of the corporation is to demand a thorough revision and rigid enforcement of such laws as will protect the manufacture of honest dairy products against undue competition from deceitful and dangerous imitations; and to unite the rank and file of its members in instituting a regular crusade against the unjust practice of pooling milk at cheese factories by weight, without regard to the butter fat which it contains."

The Wisconsin Cheese Makers' Association came into existence during the dark days when the filled cheese fraud was cursing the state and destroying the industry. It was born of necessity. The Wisconsin Dairymen's Association was the parent dairy organization of the state. That association was organized in 1872. That association for a number of years comprised all the dairy interests of the state. Then, the cheese producing industry was in its infancy. There were no ample and reliable markets for even the small quantity of cheese then produced in Wisconsin. There was widespread prejudice against the Wisconsin product, but as it became demonstrated that Wisconsin possessed all those favorable conditions necessary for the production of the finest quality of cheese of all varieties, including the great abundance and variety of nutritious grasses, thousands of springs, lakes and flowing wells containing purest cold waters, together with temperate summers and a climate, owing to its proximity to the lake, especially adapted to this industry, markets were opened and the industry was launched upon its great career.

An organization separate from the Dairymen's Association which had to do especially with the questions pertaining to the manufacture of cheese became an imperative necessity of the time, as the Wisconsin Dairymen's Association specialized its efforts along the line of the production of milk and the necessary feeding, breeding and care taking of the dairy herds.

As before stated the Wisconsin Cheese Makers' Association was organized at a time when the filled cheese fraud was destroying the English market which Wisconsin cheese had won by merit and was prostrating the industry. The first efforts of the Association were directed to the annihilation of the filled cheese fraud. For a time the conflict was fierce but within a few years the battle was won since which time it has never

reappeared in this state. The Wisconsin Cheese Makers' Association was one of the most potent forces in the annihilation of that fraud and it has ever since that time continued to be a powerful organization; powerful in calling the cheese makers together once every twelve months to compare notes and exchange ideas; powerful in teaching to every teachable cheese maker within the borders of Wisconsin the true principles of cheese making; powerful in instilling into the minds of the cheese makers of the state that the laws which govern the making of a cheese which our domestic trade calls for, should be diligently studied and strictly followed; powerful in disseminating knowledge through our annual reports to the absent cheese maker, as well as those present, because with those absentees the knowledge has been most needed.

I have already complied with your request to send you copy of all important publications issued by this Association since January, 1909. I have delivered to you personally a complete set of all published reports of the Association. The first aid from the state to this Association was an appropriation of $400 annually and the printing of four thousand copies of the annual reports, one thousand of which were to be in cloth, the reports not to exceed two hundred pages, by chapters 259 and 314 of the laws of 1899; the amount of the appropriation was increased to $600 by chapter 321 of the laws of 1903. By paragraph 20.28 of chapter 657 of the laws of 1911, provision is made for the printing of the annual transactions of the Wisconsin Cheese Makers' Association, not more than four thousand copies, containing not more than two hundred pages each.

You request that I show the work that the Association has been able to do under the law. The most comprehensive showing that I am able to make of the work which the Association has been able to do is the published reports of its annual meetings, but to indicate more briefly the general scope and character of the work I have selected from the published reports of the proceedings of the annual meetings of the Association some of the names of the distinguished and specially qualified gentlemen and ladies that the Association has been able to secure in consequence of the appropriation received from the legislature, to wit:

HONORABLE H. C. ADAMS, Madison, Wisconsin. Dairy and Food Commissioner of Wisconsin from February 7th, 1895, to May 1st, 1902:

1897—Address.
1898—Address.
1899—Address.
1900—Address.
1901—Address.

DR. S. M. BABCOCK, Madison, Wisconsin. Chief Chemist, Agricultural Experiment Station. Inventor of the Babcock Milk Test and Assistant Dean of the Wisconsin College of Agriculture:

1901—"Influence of Rennet on Cheese Ripening".
1901—"Influence of Low Temperatures on Cheese Ripening".
1902—"Cold Curing of Cheese".
1902—"Relative Advantages of Consolidated Cold Curing Stations for Cheese".

PROFESSOR G. H. BARR, Strathroy, Ontario, Canada. Chief Instructor for Western Ontario:

1904—"Cheesemaking in Ontario".
1904—"Instruction in Cheese Factories in Western Ontario".

HONORABLE W. W. CHADWICK, Monroe, Wisconsin. Assistant Dairy and Food Commissioner:

1899—"Outlook of the Cheese Industry in Wisconsin".

PROFESSOR W. J. CARSON, Guelph, Ontario, Canada. Assistant Dairy Husbandman, Guelph Dairy College:

1905—"Our Cheese Industry as It Is and as It Should Be".
1905—"The Acidimeter and Its Application to Cheese Making".

MISS EMMA CONLEY, Wausau, Wisconsin. Domestic Economy, Marathon County School of Agriculture and Domestic Economy:

1906—"Cheese as a Food".

PROFESSOR J. W. DECKER, Columbus, Ohio. Professor of Dairy Husbandry, Columbus Agricultural College:

1897—"Cheese Making".
1898—"What I Saw in Europe".
1899—"Growth and Development of the Swiss, Brick and Limburger Cheese Industry in Wisconsin".
1900—Address.

PROFESSOR C. A. DOANE, Washington, D. C. Dairy Expert, U. S. Department of Agriculture:

1906—"Cheese Problems that can be Profitably Investigated".
1907—Address.
1912—"Paraffining Cheese".

HONORABLE A. D. DELAND, Sheboygan, Wisconsin. Ex-President Wisconsin Dairymen's Association:

1898—"The Starter from the Buyer's Standpoint".
1902—"The Cheese Contests at the Pan American Exposition".
1905—"Pressing, Bandaging and Boxing of Cheese".
1912—Address.

HONORABLE H. H. DEAN, Guelph, Canada. B. S. A. Dairy Husbandry Ontario Agricultural College:

1903—"The Desirable Qualities in Canadian Cheese".
1903—"Will the Acidimeter Replace the Rennet and Hot Iron Tests in Cheese Making"?

HONORABLE C. H. EVERETT, Racine, Wisconsin. Editor, Wisconsin Agriculturist:

1903—"The Cheese Maker and the Patron".
1904—"The Cheese Maker".

HONORABLE J. Q. EMERY, Madison, Wisconsin. State Dairy and Food Commissioner:

1904—Address—"Laws Relating to Clean and Sanitary Conditions in Cheese Factories".
1905—Address—"What Must Wisconsin Cheese Factories Do to Improve the Quality of Their Cheese".
1906—"Recent Legislation Affecting the Dairy Industry".
1907—"Awarding of Special Prizes, Medals, Diplomas and Pro Rata Premium Funds".
1908—"Awarding of Special Prizes and Diplomas".
1909—Address.
1911—Address.
1912—Address.

HONORABLE STEPHEN FAVILLE, Madison, Wisconsin. Ex-President Wisconsin Dairymen's Association:

1898—Address.
1901—"History of the Cheese Industry in Wisconsin".

PROFESSOR E. H. FARRINGTON, Madison, Wisconsin. Professor of Dairy Husbandry. In Charge of Wisconsin Dairy School:

1901—"The Influence of Heat on the Separation of Fat by the Babcock Test":
1905—"The Manufacture of Whey Butter".
1907—"Calculating Cheese Factory Dividends".
1909—"Cheese Making in Europe".

PROFESSOR A. J. GLOVER, St. Paul, Minnesota. Cheese Expert, Minnesota Dairy and Food Department. Associate Editor, Hoard's Dairyman:

1900—"The Common Interests of Cheese Maker and Patron".
1902—"Milk Production".
1905—"How to Get Better Milk for the Cheese Factories".
1907—"How to Produce Clean Milk".
1909—"The National Dairy Show and Its Relation to the Cheese Makers of Wisconsin".

HONORABLE W. D. HOARD, Ft. Atkinson, Wisconsin. Ex-Governor of the State of Wisconsin:

1897—Address.
1898—Address.
1900—Address.

PROFESSOR G. C. HUMPHREY, Madison, Wisconsin. Animal Husbandry, University of Wisconsin:

1911—Address.

PROFESSOR E. G. HASTINGS, Madison, Wisconsin. Assistant Bacteriologist, Agricultural Experiment Station:

1907—"Some Reasons Why Tuberculosis in Cattle is Important to the Cheese Maker".
1911—"Some Methods of Improving the Quality of Milk".
1911—"The Importance of Proper Methods of Propagation of Starters for Cheese Making".

PROFESSOR T. L. HAECKER, St. Anthony Park, Minnesota. Dean of Minnesota College of Agriculture and Professor in Dairy Husbandry:

1899—Address.

DR. E. B. HART, Madison, Wisconsin. Professor of Agricultural Chemistry, University of Wisconsin:

1908—"An Equitable Method for the Payment of Milk Delivered to a Cheese Factory".

HONORABLE L. W. HANSON, Seattle, Washington. Washington State Traveling Dairy Inspector:

1907—"Pacific Coast Cheese Making".

PROFESSOR W. A. HENRY, Madison, Wisconsin. Dean of the College of Agriculture, University of Wisconsin:

1898—Address.
1899—Address.
1900—Address.
1902—Address.

MRS. ADDA F. HOWIE, Sunny Peak Farm, Elm Grove, Wisconsin:

1903—"Breeding and Rearing a Profitable Dairy Worker".
1905—Address—"Dairying".

HONORABLE ROBERT JOHNSTON, Woodstock, Ontario, Canada:
1906—Address.
1907—"Cheddar Cheese Making".
1907—"The Up-to-date Cheese Maker".
1909—"Cheddar Cheese Making".
1909—"Syndicate System of Cheese Factory Instruction".

PROFESSOR F. H. KING, Madison, Wisconsin. Physicist of the University of Wisconsin:
1897—"How to Construct Cheese Curing Rooms to Maintain Equal Temperatures".
1899—"The Construction of Cheese Curing Rooms from a Practical Standpoint".

PROFESSOR C. A. LEE, Madison, Wisconsin. Assistant Professor of Dairying. In Charge of Wisconsin Scoring Exhibitions:
1909—"The Advantages of Scoring Exhibitions".
1911—"The Relations of the Wisconsin Scoring Exhibitions to the Cheese Interests of the State".
1912—"The Relations of the Wisconsin Scoring Exhibitions to the Cheese Interests of the State".

HONORABLE J. H. MONRAD, Winnetka, Illinois. Editor and Publisher of "Dairy Messenger". Assistant Dairy and Food Commissioner of Illinois. Dairy Expert, The Dairy Division, U. S. Department of Agriculture. Editorial Staff, New York Produce Review and American Creamery:
1897—Address.
1898—Address.
1899—Address.
1900—"Some Remarks on Swiss, Brick and Limburger Cheese".
1905—"Cheese from Pasteurized Milk".
1905—"Coöperation".
1906—"A Plain Talk with the Cheese Makers".

PROFESSOR R. A. MOORE, Madison, Wisconsin. Agronomist, Wisconsin Experiment Station:
1904—"The Factory Operator—an Organizer for the Betterment of Rural Communities".
1908—"Alfalfa".

HONORABLE GEORGE W. McADAM, New York City, N. Y.:
1898—"Cheese Buyers and Methods of Marketing".

HONORABLE T. B. MILLER, London, Ontario, Canada. Manager, Thames Dairy Company:
1903—Address—"Cheese Making".

PROFESSOR JOHN MICHELS, Lansing, Michigan. Author of "Creamery Butter Making":
1905—"The Manufacture of Domestic Types of Cheese".

HONORABLE GEO. W. McKERROW, Madison, Wisconsin. Superintendent of Wisconsin Farmers' Institutes:

1898—"The Common Interests of Cheese Maker and Patron".
1899—"The Common Interests of Cheese Maker and Patron".
1906—"Cheap Feeds for Milk Production".

HONORABLE D. M. MacPHERSON, Lancaster, Ontario, Canada. Ex-Member of Provincial Parliament:

1899—Lecture: "The Modern Improved Methods of Cheese Making, or the Science and Art of Cheese Making".

PROFESSOR D. H. OTIS, Madison, Wisconsin. Animal Nutrition, Agricultural Experiment Station:

1908—"The Feeding Value of Alfalfa".

HONORABLE R. A. PEARSON, Washington, D. C. Assistant Chief of Dairy Division, Department of Agriculture. Chief Commissioner, Department of Agriculture, State of New York:

1899—Address.
1901—Address.
1912—Address.

DR. H. L. RUSSELL, Madison, Wisconsin. Professor of Bacteriology, University of Wisconsin. Dean of the College of Agriculture and Dairying, Wisconsin Experiment Station:

1898—"Recent Investigations in Cheese Making".
1901—"Influence of Rennet on Cheese Ripening".
1901—"Influence of Low Temperatures on Cheese Ripening".
1902—"Cold Curing of Cheese".
1902—"Relative Advantages of Consolidated Cold Curing Stations for Cheese".
1906—"Yeast as a Cause of Gassy Fermentations in Swiss Cheese".

PROFESSOR J. A. RUDDICK, Ottawa, Canada. Official Referee, Dominion Department of Agriculture. Honorable Commissioner Canadian Dairy and Cold Storage Department of Agriculture:

1901—"Dairying in New Zealand".
1901—"Cheese Making".
1912—"Dairying Features of Canada and Dairying in Other Countries".
1912—Address: "Cheese Making".

MISS M. A. RAEDER, Milladore, Wisconsin:

1903—"Women as Cheese Factory Managers and Cheese Makers".

HONORABLE B. H. RAWL, Washington, D. C. Chief of Dairy Division, U. S. Department of Agriculture:

1909—Address.

DR. M. P. RAVENEL, Madison, Wisconsin. Bacteriologist, Wisconsin Live Stock Sanitary Board:

1911—"Some Reasons for Fighting Bovine Tuberculosis".

PROFESSOR ARCHIBALD SMITH, Strathroy, Ontario, Canada. Chief Superintendent Western Dairy School:

1902—"Some Recent Experiments in Cheese Making".

1902—"Cheese Factory Sanitation".

DR. J. L. SAMMIS, Madison, Wisconsin. Assistant Professor of Dairy Husbandry, University of Wisconsin:

1911—"The Improvement of Cheese Making".

1912—"Improvements at the Cheese Factory".

PROFESSOR F. G. SHORT, Ft. Atkinson, Wisconsin. Associate Editor, Hoard's Dairyman:

1904—"Some Things Outside the Cheese Factory".

HONORABLE C. J. STEFFEN, Milwaukee, Wisconsin. President International Association of Dairy and Milk Inspectors. Chief Milk Inspector of the Health Department of the City of Milwaukee:

1912—"Sanitary Milk Production".

HONORABLE E. K. SLATER, St. Paul, Minnesota. Minnesota State Dairy and Food Commissioner.

1906—Address: "Dairying".

1909—Address: "Dairying".

HONORABLE I. W. STEINHOFF, Stratford, Canada:

1906—"The Necessity of More Perfect Coöperation in a Coöperative Business".

1906—"The Benefits of a Thorough System of Instruction in the Manufacture of Cheese".

HONORABLE S. C. THOMPSON, Winterport, Maine. Maine State Dairy and Food Commissioner:

1904—Address.

PROFESSOR F. E. TURNEAURE, Madison, Wisconsin. Dean, College of Mechanics and Engineering:

1907—"Sewage Disposal".

DR. L. L. VAN SLYKE, Geneva, New York. Chief Chemist, Geneva Experiment Station:

1900—"The Influence of Temperature and Moisture Upon the Composition of Cheese During Ripening".

PROFESSOR F. W. WOLL, Madison, Wisconsin. Chemist, Wisconsin Experiment Station:

1903—"The Babcock Test and the Cheese Maker".

1909—"The Dairy Farmer and Pure Feeds".

HONORABLE E. H. WEBSTER, Washington, D. C. Chief of Dairy Division, U. S. Department of Agriculture:

1906—Address.

1908—Address.

1909—Address.

HONORABLE H. R. WRIGHT, Des Moines, Iowa. Iowa State Food and Dairy Commissioner:

1907—Address.

Addresses of the kind indicated above have been provided as one feature of each of the annual meetings of the Association. It seems unnecessary for me to argue the great value to the cheese makers and others interested in that industry of the addresses upon the topics indicated by the gentlemen of such distinguished ability, as many of these speakers have been the foremost authorities on cheese making to be found on this continent.

Another feature which has characterized each of our annual meetings has been the presentation of some phase of the technics of cheese making by the most able and skillful cheese makers available, and all these papers of both kinds have been thrown open to discussion, and the papers and the discussion reported by a competent stenographer and prepared for publication in the reports.

Still another feature of very great educational value that has characterized all our meetings from the beginning is what we have called the cheese exhibits. These cheese exhibits have consisted of cheese makers in the various parts of the state sending to the place of meeting of the Association each year a cheese of any variety, such as "American", Cheddar, Swiss, Brick or Limburger, presumably of his best make. The most competent experts have been employed who critically examine and score each cheese thus exhibited. Accompanying this report is a blank score card used for this purpose. To encourage the exhibition of cheese in this way and secure the consequent benefits, pro rata premiums have been awarded to exhibitors whose product has scored 92 and above, that is to cheese of demonstrated merit, and diplomas have also been awarded to exhibitors of such cheese. A sample copy of the diplomas used is herewith submitted. In this connection I may state that the secretary of the Association has during all these years performed the function of an information bureau. He has written to the exhibitors of cheese, pointing out to each exhibitor the defects of the cheese exhibited and means for correcting or improving the same. He has answered during these years thousands of inquiries relating to cheese making prob-

lems and difficulties. Circulars and a variety of printed documents have been prepared by him and furnished to the cheese makers and cheese factory owners and managers of the state.

As one feature of the cheese exhibits at the annual meetings of the Association the best cheese of each variety, that is the cheese that has scored the highest, is cut and samples furnished to each member present. Thus he is given a concrete example of the very best quality of cheese produced in the state and his attention is called to the characteristics of that cheese, and then the maker of the cheese is called upon publicly to describe how he produced that product. All of these together with certain other features that the limits of this report preclude, constitute educational work of the highest and most practical value to the cheese makers and cheese producers of the state. This seems to be so apparent that I forbear further discussion of this subject. But to add to and to greatly widen the benefits of these meetings these proceedings when published as result of state aid are distributed to the cheese makers of the state and to others interested to the end that the educational features of our annual meetings might reach to every nook and corner of the cheese producing regions of the state. This is a species of practical "extension work" that has been of incalculable value in promoting and improving every phase of the cheese producing industry in Wisconsin.

The need and value of the work done by the Wisconsin Cheese Makers' Association will appear in greater clearness when it is stated that reports indicate that less than twenty per cent of all the cheese makers of the state have attended any dairy school. In this connection I quote the following from an address, delivered by Honorable J. Q. Emery, Dairy and Food Commissioner, at the twentieth annual meeting of the Wisconsin Cheese Makers' Association on January 11th, 1912, entitled "One Phase of the Work of the Wisconsin Dairy and Food Department," to wit:

"These annual meetings where the cheese makers of the state gather for a discussion of their mutual interests, where the most eminent authorities on the great cheese industry are secured to discuss the most important and timely subjects pertaining to the business, and where the products of your skill are gathered in competition, their relative merits to be determined by the honest and dis-

interested judgment of experts, together with all these addresses and discussions and the results of these competitive contests gathered into a printed volume and distributed to the cheese makers of the state, and all this conducted from year to year with the highest loyalty to the business as a whole and not for selfish exploitation of any individual, all combine to constitute a force of great potency for the cheese industry of our great state. An association with the purpose embodied in your articles of incorporation, working on such a high plane of endeavor, means progress and prosperity for the great cause."

It is not too much to claim that the Wisconsin Cheese Makers' Association has been one of the most potent forces in the state in promoting and building up the great cheese producing industry. How much that means is indicated by the following statements.

Wisconsin has a larger number of cheese factories than any other state in the union. No cheese producing district in America of like area produces as much cheese of as many varied styles and types as is to-day being made within the boundary lines of this state.

Following are the cheese industry statistics for the state of Wisconsin for the year 1909, taken from the report of the dairy and food commissioner for the biennial period ending June 30, 1910.

The figures relating to cheese factories were obtained from the owners or managers of the same by inspectors of that department and are believed to be the most complete and reliable figures ever before published on this subject. The figures relating to farm-made cheese were obtained from the town assessor's reports.

	No. of pounds	Received for or valued at
Cheese of all kinds produced in factories	145,171,235	$20,706,749
Other cheese factory products sold		234,022
Cheese produced on farms	1,433,702	90,118
Whey		2,043,000
Total		$23,073,889

Number of cheese factories	1,928
Number of patrons of cheese factories	39,847
Number of cows contributing to cheese factories	438,106

The "American" types of Cheddar cheese are manufactured to a greater or less extent in all parts of the state.

The eastern or lake tier of counties embracing Sheboygan, Manitowoc, Calumet, Kewaunee, Door, Fond du Lac, Brown, Outagamie and adjoining counties to the north and west lead in the production of fancy "American" Cheddar types of cheese so far as quantity is concerned.

Grant, Sauk, Richland, Iowa and adjoining counties constitute the famous southwestern "American" Cheddar cheese territory of Wisconsin.

Dodge county is the great center in Wisconsin for the production of brick cheese of superior quality. This brick cheese producing area extends into Washington county and includes a few factories of Columbia, Fond du Lac and Jefferson counties.

Green county is the great Swiss cheese county of the state, and is the home of the Swiss cheese industry in America. The best grades of this variety of cheese when properly cured are equal to the best grades of imported Swiss cheese. The district extends through La Fayette and into portions of Iowa counties and embraces southwestern Dane county with some factories in the western part of Rock county. Large quantities of Limburger cheese are also manufactured in this district. The southwestern portion of Dane county is especially noted for the quality of this variety of cheese. Brick cheese is also manufactured in this district.

The annual meetings of the Association are held regularly at Milwaukee, which is readily accessible to all of the cheese producing districts of the state.

The appended list of the varieties of cheeses that are being made in various parts of the state represents an enormous source of wealth.

HARD.		SOFT.
(a) Domestic Varieties.		Pot Cheese or Schmierkase.
Cheddar	Young America	Neufchatel
Flats	Longhorn	Club House
Plain Daisy	Square	Bric
Marked Daisy	Print	Square Cream
Baby Daisy	Loaf	French Cheese
Little Favorite	Pineapple	Hand Cheese
Special	Sage	Camembert
Twins	Sap Sago	Potted Cheese
Picnic	Mysort	D'Isigny
		Prepared Cheese
(b) Foreign Types.		Cottage
		"Buttermilk Cheese"
Swiss or Emmenthaler	Brick	"Schmierkase"
"Whey Cheese" (Norwegian)	Munster	
	Limburger	
Edam	Round Cream	
Gouda	Palmetto	
Herb	Clover Cream	

Wisconsin's success in cheese making is largely due to two things. In the first place, of recent years every effort has been brought to bear to raise the standard of excellence to the highest point. This has been largely influenced by the annual meetings of the Wisconsin Cheese Makers' Association, and the rigid inspection, counsel, advice and numerous prosecutions accorded alike to patrons and to cheese makers of cheese factories, by the dairy and food commission, with which the Association has ever been in perfect agreement, coöperation and harmony.

In the second place, all adulterated or fraudulent cheese of every kind is absolutely prohibited and excluded. The best, and none but the best, fitly expresses our motto. The result is that we have established a good name for our cheese in every market where it is known; a good name justly deserved because won by merit. We have waged an uncompromising war on all fraudulent cheese and have sought to place our product upon the market, whether at home or abroad, for just what it is. The true Wisconsin cheese factory brand is today a guarantee of excellence and genuineness in the best markets of the world.

The beneficial results attained by meetings such as those of the Wisconsin Cheese Makers' Association are everywhere apparent in renewed interest in the dairy business, in the better care of milk, and the manufacture of a better quality of cheese, in the better preparation of all dairy products for the market, in a more intelligent study by dairymen of the questions of markets, and general uplift of the whole dairy business.

Curiosity is aroused by the novelty of these conventions, and those drawn into the meetings become interested in the practical discussions which are held, and are thus led to give to their business more careful and intelligent thought.

You request that I go over our reports carefully and critically and see where they can be improved and where parts can be omitted without loss. I have endeavored to comply with this request. The publication of the programs in the reports as was formerly done could, as has been done in the case of the last report, be omitted without detriment. So, too, the type used in the publication could be reduced in size from that used in former reports to that that is used in the last report. The number of reports to be printed could be reduced from four thousand to twenty-five hundred exclusive of those provided for public documents without serious detriment, but this should include a thousand in cloth and fifteen hundred in paper. I do not think the number of pages could be reduced without detriment. In the last report the discussions which were a very valuable part of the proceedings of our Association were almost wholly eliminated and the report is less valuable in consequence.

I have sought to the best of my ability to comply with your requests in the preparation and submission of this report. If any points have been omitted on which you desire information or if you have further specific questions to ask, I shall cheerfully respond to the same to the best of my ability.

Respectfully submitted,

U. S. BAER,

Secretary, Wisconsin Cheese Makers' Ass'n.

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS

OF THE

Wisconsin Cheese Makers' Association

TWENTIETH ANNUAL MEETING, 1912.

The Wisconsin Cheese Makers' Association met in its twentieth annual session at Convention Rooms, Republican House, Milwaukee, and was called to order at 10 o'clock A. M., Wednesday, January 10, 1912, by the president, Mr. John B. McCready.

Mr. F. A. Cannon, Secretary Citizen's Business League of Milwaukee, Wisconsin, gave a very appropriate address of welcome.

Hon. A. D. DeLand of Sheboygan, Wisconsin, responded by expressing in most fitting words the appreciation and thanks of the Association for the courtesy and hospitality extended the delegates in attendance by the worthy representative of Wisconsin's "Cream City."

PRESIDENT'S ADDRESS.

JOHN B. MCCREADY, MARSHFIELD, WIS.

Mr. Chairman, Ladies and Gentlemen: Again it is my privilege to address you in the capacity of President of this Association, and for this privilege, I assure you I feel grateful to you all. I consider it an honor to be President of this, the greatest organization of its kind in existence, and I cannot help but feel that it is an honor that should be shared by others. You have seen fit to elect me to this office on three different occasions, while at times I have held other offices in your Association, and I feel that you have been more than good to me, and that I have not always been deserving of the honors you have shown me; yet if my efforts have met with your approval and if I have at any time, in my own small way, been any help to you and to this Association, then I shall know that I have not served you in vain.

The success of this Association is not dependent upon the officers alone, but upon each and every individual member, and you can hardly imagine, until you try it, what a strong organization you could make of this. Here we have a membership of six or seven hundred and not all of these are actual cheese makers, yet we have almost two thousand factories in the state to draw from, which should give us a membership of at least two thousand, not counting the hundreds of helpers, who work in these factories and will one day be cheese makers.

It has not been possible for Mr. Baer and the other officers to call personally on every one of these two thousand cheese makers, to convince them that they should join us, but it is possible for each and every one of you present here, to call on your neighboring factory man and convince him that he should join this Association.

I do not want to say too much about this lack of support and interest on the part of some cheese makers in this state, but I can conceive of no reason why all are not members. You represent an industry whose revenue runs into millions of dollars annually, and yet only a few are trying to better this industry while others stand idly by and take the credit.

You are a part of the great labor organization of this country, yet you are not organized. I am not a believer in strikes or lockouts, but I do believe that every man engaged in work, such as cheese making, where not only labor is required, but a combination of labor and skill is necessary, should belong to an association that stands for a betterment of his condition, for improvement in the product he helps produce, and where, when abuses creep in, he can go before his fellows and express his opinion, and be assured of the moral support, at least, of his co-workers.

There is no getting around the fact that the cheese industry contains a host of underpaid, incompetent, cheap laborers. Now, how are these excuses to be gotten rid of? By each of us fighting our battle alone, or by getting together and insisting upon what is our right, that these incompetents be relegated to the scrap heap where they belong, that only those capable of making a first-class cheese be permitted to work at the business, and that those who are capable, honest and efficient, be paid a price commensurate with the work they do. In this way, Wisconsin cheese will be improved, your conditions will be bettered, and we will all be better and happier workers.

This Association is yours, for your benefit, and it will be your fault if you do not build it up and make it do the work for which it is intended. Your officers cannot do it all; you must help, and I sincerely hope and trust that you will resolve to work until you have reached a point where you can really be satisfied that you have done your share.

There is room for improvement in Wisconsin cheese. True there is a great deal of good cheese made, but there are thousands of dollars lost every year to Wisconsin through poor cheese, which you know or hear very little about. If all the poor cheese made could be converted into good cheese, the difference in price would pay the cost of an instructor for every cheese county in the state, and right here I want to speak of these instructors. Where have they gone? A few years ago we had men like Philips, High, Aderhold, Baer and others who did good work among the factories acting as instructors. In fact, your humble servant could be mentioned in this list, but modesty forbids any comment. To-day, I do not know of a cheese instructor who is being employed, and

I cannot realize why, for as the industry grows, instead of these instructors being extinct, they should be increasing.

As I understand it, Philips introduced the **curd racks,** Aderhold the **sub-earth duct** and a few stories, while Baer and I taught the workings of the **Wisconsin curd test,** and the making of pure **culture starter,** but there have been many improvements since then. We need men now to go out and teach the use of the acidimeter and other new and improved methods to some of the old-timers who have not been to the dairy school and met instructors in the last few years. I think it is up to this Association to find out why instructors are not being employed, and to find out if it is not possible for this state to help in some way to furnish men for this work.

Suppose the first year they appropriate $25,000.00 for this work. This is only a small part of what is lost to the farmers on undergrade cheese every year. I have bought cheese long enough to state positively that Wisconsin loses half a million dollars annually in poor cheese, and I might add, "And then some." So it would seem that $25,000.00 would be a good investment if properly placed on instructors.

Now I will not encroach further on your time; there is more on the program that you will want to hear. Secretary Baer has come forward with his usual fine program, and he is the one man to whom you should all feel grateful; he is the worker and the booster for this Association, and he will just continue to accept our thanks until he is better repaid.

In closing I want to say that I am not a candidate for re-election, I think it only fair to let you know this at the start. I feel that I have had my share of the honors, and if for nothing else, I feel that I am no longer eligible. If you will remember the time when I was first nominated to this office, you will recall that Mr. Aderhold said I should have it on account of my auburn hair, and as time changes, and we with time, and as the silver threads are fast taking the place of the gold, it indicates that my term of office is about at a close.

I take this opportunity of wishing you all that is best for 1912, and to give you my assurance, that even though you will not find me an officer over you, you will still find me a private in the ranks.

TREASURER'S REPORT FOR 1912.

J. J. REID, Oconomowoc, Wisconsin.

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

RECEIPTS.

1911		
Jan. 11	Balance brought forward	$511 58
Jan. 11	Hon. S. A. Cook, contribution	25 00
Jan. 15	Memberships, 1911 meeting	344 00
Jan. 15	68 entries cheese, $2.00 each, pro rata	136 00
Jan. 19	State treasurer's draft	600 00
		$1,616 58

DISBURSEMENTS.

1911		
Jan. 12	Pro rata premium fund	$153 16
Jan. 12	C. F. Kraemer, signs	5 00
Jan. 13	P. W. Wallace, expenses attending 1911 meeting	5 66
Jan. 13	Miss Josephine Malley, stenographer, services	3 25
Jan. 14	Schwaab Stamp & Seal Co., 1000 badges	40 00
Jan. 14	A. C. Koehler, expenses, 1911 meeting	7 00
Jan. 14	J. W. Cross, supt. of cheese exhibits	33 66
Jan. 14	A. L. Cross, photographer	7 50
Jan. 15	Republican House, hotel bill 1911 meeting	108 88
Jan. 27	Fred Marty, advertising	28 97
Jan. 29	U. S. Baer, secretary	26 00
Jan. 27	F. P. Schwingel, expenses 1911 meeting	8 78
Jan. 30	E. G. Hastings, expenses 1911 meeting	6 48
Jan. 30	J. B. McCready, expenses 1911 meeting	7 40
Jan. 30	Alex. Schaller, expenses 1911 meeting	8 75
Jan. 30	T. A. Ubbelohde, expenses 1911 meeting	4 70
Jan. 30	J. D. Cannon, expenses 1911 meeting	11 25
Jan. 30	John Grootemont, expenses 1911 meeting	13 60
Jan. 30	J. L. Tormey, expenses 1911 meeting	5 78
Jan. 30	R. C. Oosterhius, expenses 1911 meeting	4 58
Mar. 1	C. E. Lee, expenses 1911 meeting	4 78
Mar. 1	Mrs. M. G. Carpenter, reporting	78 90
Mar. 1	W. A. Bothwell, refund on account	2 00
Mar. 1	Mrs. Alma B. Roump-Fish, stenographer, services	29 03
Mar. 6	G. Marty, expenses 1911 meeting	4 78
Mar. 14	U. S. Baer, secretary	22 38
Apr. 4	Democrat Printing Co., printing	1 75
May 1	Jacob Andrea, expenses 1911 meeting	7 74
May 1	Mrs. Alma B. Roump-Fish, stenographer, services	2 18
May 22	W. C. Thomas, printing	10 50
July 7	F. A. Averbeck Company, silver cups	100 60
July 8	U. S. Baer, postage	8 00
Sept. 13	J. B. McCready, traveling expenses	13 30
Oct. 1	Mrs. Alma B. Roump-Fish, stenographer, services	8 29
Oct. 2	U. S. Baer, secretary	12 50

Oct. 24	Secretary office, postage	25 00
Nov. 20	U. S. Baer, traveling expenses	15 41
Dec. 1	Mrs. Alma B. Roump-Fish, stenographer, services	39 23
Dec. 5	Streissguth-Petran, half tones and copy	5 00
Dec. 11	W. C. Thomas, printing	11 00
Dec. 13	U. S. Baer, secretary	63 98
Dec. 27	U. S. Baer, secretary	23 50
1912		
Jan. 10	U. S. Baer, secretary, salary	200 00
	Total disbursements	$1,180 25
	Balance in hands of treasurer	436 33
		$1,616 58

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

ADDRESS.

PROFESSOR R. A. PEARSON, ALBANY, N. Y.
Commissioner, Department of Agriculture, State of New York.

Mr. Chairman and Gentleman: Years ago when we dairymen used to meet, when I came to Wisconsin fifteen years ago to meet with you, there were two kinds of subjects we considered most frequently. One of those was the frauds. We had to contend then with oleomargarine and we had also to contend with wash curd cheese, and we always had to contend with those people who would adulterate milk. These were some of the subjects to which we were giving a great deal of attention fifteen years ago, and another subject was how to make more and better dairy products. Those were the things we were talking about and how little we knew what difficulties were actually in the way of our making better products. That was before Russell brought out his book on bacteriology. When a shipment of cheese went wrong in flavor, was off, we attributed it to all kinds of reasons except the real reason.

To-day, thanks to the work of our scientists and thanks to the work of such practical men as you in this room, we do know how to handle the difficulties that come up in our dairy work. Mind you, I do not say we do handle them but we

know how. I think there is scarcely any difficulty that arises in the cheese factory but Mr. Baer in this state, some of you in the audience and some men in our state could explain away very quickly, and those were the things we were working after years ago, groping in the darkness trying to find the whys and wherefores, and to-day it is different. We have information all around us as to how to meet that condition, this condition or the other condition. To-day a great many farmers in our state (apply it to yourselves if you think it best), a great many milk producers, a great many cheese makers and butter makers are literally famishing for a good drink of information and it is right at their hands to be dipped up, and they do not know it is there. Where? Our college is sending it out in bulletins, in reading lessons and in letters. The U. S. Department of Agriculture at Washington is sending it out, and I suppose that every state in the Union which has a dairy department would gladly answer an inquiry from a dairyman anywhere in the country.

An illustration not along dairy lines, but which applies: In 1899 in our state a certain farmer sold his fruit for $275. The coddling moth had come and laid their eggs and the worms had reached that fruit, so he only had $275 worth of it that he could sell. The next year he had a little larger crop, but the moth was still back and he only got $250 for his fruit. The coddling moth had come back again and had reached that fruit. The professors at the Agricultural College knew what to do for the coddling moth, his neighbors knew what to do for the coddling moth, thousands of men in New York state knew what to do for the coddling moth, and at last this man woke up and threw down his bucket and he found the thing to do was to spray at a certain time, and he sprayed. The next year he sold $1,700 worth of fruit. The information had been there all the time, all those years and it was only necessary for him to get it and apply it.

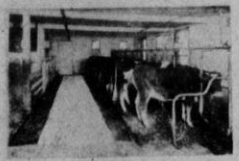
So gentlemen, to-day the problems in our state are, first, how to combat the frauds for we shall ever have them with us; second, not so much how to make better dairy products and more of them but how, in the name of Heaven, to get the information that is available in the United States. How shall we get it into use for the present and afterwards?

Third, In our state a burning question to-day, a question to which we are going to give three days' attention next week in a meeting in our State Capitol, a meeting of farmers, a burning question in our state is,—how shall the producer who handles the dairy products, milk especially, but the producers of all kinds of farm products, succeed in getting their fair share of what the consumers pay for those products?

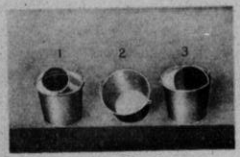
Those are the great problems of the present time. Those are the problems we are confronted with just now. Now, what is it that causes us to dip, what is it that causes men to dip and apply the information? So far as I can see there are two things, one is necessity and the other ambition, and one or the other will cause us to bring improvement in our factories and greater prosperity to ourselves. In the story I gave you it was necessity which drove that fruit raiser to look for information and apply it. In many an instance in our state has a farm gone down and down until it was mortgaged to its limit, and then confronted by necessity, the necessity of losing that farm, confronted with starvation although not immediately at hand but within sight, then the improvement has begun. I have in mind a farm in northern New York, a great dairy section, on which there was a heavy mortgage. The old methods had been employed year after year bringing the same results, less income than outgo, and finally there was a family conference. They said, "What shall we do, shall we let the bank that holds the mortgage take the farm or shall we try another year, cut loose from the old methods and adopt some newer ideas?" To make matters worse, as they thought, the father of that family died, but the mother and two sons put their heads together and decided they would stick to it, and stick to it they did, adopting newer and better methods, and the result is to-day that farm is carrying from one hundred to seven hundred acres. Those people are literally looking for places in which to invest their money, and I can cite many instances in which the application of modern methods in agricultural work has brought about great prosperity.

Now I have thought that I was going to speak to men interested in factory management, and the thought, gentlemen, which I want to impress upon you, the same as we are trying to impress it in our state, is that the man who operates a fac-

TAKE NOTICE



Clean Barn



Closed Top Pail No. 1 used with results as shown to the right

Dirt Filtered From One Pint Milk

Open Pail
6,800
Bacteria
Per C. C.

Closed Top Pail
3,200
Bacteria
Per C. C.

Dirty Barn

Dirt Filtered From One Pint Milk

Open Pail
41,000
Bacteria
Per C. C.

Closed Top Pail
7,500
Bacteria
Per C. C.

Clean Cow

Dirty Cow

WISCONSIN CHEESE MAKERS' ASSOCIATION

The Largest Association of Its Kind in the World

PLATE NO. 2—FACSIMILE OF ILLUSTRATED, "TAKE NOTICE CARD," MAILED TO EVERY KNOWN CHEESE FACTORY IN WISCONSIN.

tory has a wonderful opportunity to serve his state, and especially the people in his own locality. How? I maintain that the man who operates a factory shall be one who is well informed along agricultural lines in general, along lines of milk production especially, and it should be his constant effort to induce his patrons to improve, to put better methods into their agriculture, and how can we do that? First, let's let them truly get a glimpse into that great world of wonder that has been opened to us by Professor Anton Van Luenhaw. I see a number of men in this audience that I dare say have learned that old story from Dr. Russell. I dare say they know the story of Anton Von Luenhaw who by accident learned to make the lenses that discovered little plants, and we have learned that those little plants are bacteria and they have a wonderful influence on our life work. Anton Von Luenhaw opened the window to a new world. Let's explain to the farmers how those little bacteria influence their milk, some make milk simply sour, others make it become bitter, others produce certain flavors in butter, others certain flavors in cheese, others produce contagious diseases, etc. Let them see those little bacteria and learn how to keep them out of the milk. We are attempting to do that in our state now in a very simple way. We are using the filter method. An inspector goes to a creamery or cheese factory and when the milk comes in he has his apparatus and secures about a pint of milk from each patron; he puts a piece of clean cotton in the strainer and after the milk is strained he takes the cotton out, holds it up and says "That came out of your milk". The farmer is astonished. The next day the farmer comes back, he wants to see his milk strained. "Has it the same amount of dirt in it? I was careful of it to-day". No, sure enough, the inspector puts it through the cotton and that is much cleaner cotton, so we are impressing that lesson on the farmer and it is having valuable results. We are trying to point out how dirt carries those little bacteria and how those bacteria do the damage.

How slowly do these modern sanitary notions come about! In our state the dairy industry is going through a rapid change. We used to produce one-half the cheese made in the United States in New York. Wisconsin had second place; you made one-fourth according to the census of ten years ago, but I shall not be surprised, when the result of the last cen-

sus is made known, if Wisconsin occupies the first place in cheese production and New York the second, because a great many cheese factories have been closed and changed into milk stations. We are sending milk by carloads into New York city. Farmers in our state are hauling milk fifteen miles to shipping stations and the result is we are making less cheese. On the other hand, in your state you are putting up more cheese factories and increasing the output of your factories, and we are losing our factories because we are sending in so much milk to the city.

We are giving a great deal of attention to the sanitary side of dairying. New York has a force of one hundred inspectors who visit dairies, scoring milk, making criticisms, etc. The department of agriculture at Albany has a large force of inspectors doing the same kind of work and we are endeavoring to have the farmers of New York state see the importance of cleanliness.

Fully ten years ago quite a number of men (I was one of them) began to talk of the advantages of the use of small top milk pails. Just for curiosity, I would like to know how many in this room are in personal contact with dairies that are using the small top milk pails? Would you mind raising your hands? Two or three. Why gentlemen, it is a thing that is as sure to come into our daily practice as the sun is to rise tomorrow morning, but how slowly it does come when you stop to think how reasonable a method that is for making cleaner milk. Here we have a pail with an opening sixteen inches across. If we reduce that opening one half or eight inches across then we cut off three-quarters of the open space through which dirt can fall; we have cut off three-fourths of the opportunity for contaminating that milk. I find when men become accustomed to that pail they like it better. I remember inducing a man to put in a small top pail and he put in one with a four or five inch opening, and at first he told me he would not have that in his dairy if I paid him for using it. I wrote back and said "I am going to ask you, as a personal favor, to try that pail another week and then let me hear from you". He wrote back at the end of the second week "I am getting along a little better, I am getting about one-half the milk". I asked him to try it still another week and then let me know. He made the experiment two weeks longer,

then wrote in and said, "I am convinced that is a splendid scheme for keeping dirt out of milk. I notice how the dirt falls from the cow and rests on the top surface of the milk pail, and if it had not been for the small space the dirt would have gone into the milk, but I have one objection to the pail, —if the cow ever gets her foot into that pail you will have to saw off her leg to get it out." I know, seriously gentlemen, that is one of the simplest, easiest and most agreeable methods for producing cleaner milk.

As I said before these things come slowly. For ten years they have been talked in New York state and only here and there is an isolated instance of a small top pail being adopted. Three weeks ago one of the representatives of our largest milk companies told me his company had ordered five thousand of these pails, and so at last that idea which is right and bound to take hold, has gotten a good big start in our state.

So it is with daylight and ventilation in our stables. We all know about the King system of ventilation; we have talked that year in and year out. At the present time there are only a few stables in New York state that have not good light. There are many stables where windows have been cut in during the last few years, and in many stables are ventilating devices so the air may be changed.

We ought to show our patrons that it is to their own interest to observe these ideas. We ought to be able to tell them if they have tuberculosis in their dairy herd it will spread more rapidly in a stuffy barn than if they allow fresh air and light in the barn. One of the first experiments along that line was carried on in Pennsylvania. They took five cows and put them into an unsanitary stable, constructed especially for the experiment. Three cows,—the end ones and the middle one, were healthy cows; the second and fourth cows reacted to the tuberculin test, were known to have tuberculosis. Then they had another stable, clean and light, well ventilated; into that stable they put three healthy cows, one at each end and one in the middle, and put in two reacters. At the end of two weeks they changed those two reacters with the two reacters in the other stable, so month after month the healthy cows had the same amount of exposure to disease. After about fifteen months the ten cows were killed, and in the unwholesome, unsanitary stable it was found that all three of the original

healthy cows had acquired the disease of tuberculosis, while in the sanitary stable it was found that only one had taken the disease and that in a slight form, and the other two remained healthy. What an important lesson it is for our dairymen, with tuberculosis more or less throughout the state, and we ought to be giving this lesson to our patrons.

But to-day the thing in dairying of which we are proudest in our state is the establishment of cow-testing associations. How many of you are in personal touch with cow-testing associations in this state? Only one or two. A number of those associtions have adopted the small top milking pail. I ought not take your time to argue for them because *Hoard's Dairyman* has been an earnest advocate of those associations for many years. Why don't we dip up that information and apply it? Well I will tell you why, because we have not been driven by the necessity or have not sufficient ambition. You know the cow-testing association originated in Denmark. Over there the dairymen were compelled to buy their feed, largely from the United States, at prices fixed in this country. They were compelled to sell their butter in the English market at prices fixed there and the margin between cost and income was not enough to enable them to get along. They were confronted by disaster and were forced to do something to improve the situation. They picked out cow-testing associations and put a man in charge of twenty-five or thirty dairies. He visited a dairy each day in the month, and at the end of the year he was able to tell the dairyman the cow that was eating her head off and which cow was a profitable cow. Nobody is such a judge of an animal that he can tell those things by merely looking at her. It seems absurd to me to hear a man say he can judge a cow by her looks. Did you ever hear of a bank cashier who was going to select a teller and would get out a score card and say "How long is your thumb, or how high is your forehead, or what is the color of your eyes?" We would not judge a man by that and we should not judge a cow in that way. The way we do is to find out what the man's previous record is, if he was employed in a place a certain length of time and got results that were satisfactory, that is the man we want in the bank. If a cow has given a good result with scales and test for a year then we want to retain her. In Denmark the average production has

been increased as much as a thousand pounds per dairy in many instances, and those dairymen through coöperation have changed themselves from a poverty-stricken community to one of the most abundant and well-to-do- people on the face of the earth. In New York state those things are being understood. We have fifteen or twenty associations. We have issued one or two bulletins pointing out the influence of the cow-testing associations. The farmer seems to have been awakened and there has come a greater and greater demand for cow-testing associations.

Then our patrons should be better informed on bovine tuberculosis in our state; we are trying to impress on them that tuberculosis is contagious and an animal having the disease can transmit it to a healthy animal. Secondly, the calves born from animals having the disease are almost always born healthy and we must separate them from their diseased mothers in order to keep them healthy. So now in our state we have scores of dairies, literally scores of dairies, where great care is taken when the calves are born to separate them at once from the animals that have the disease, rear them in new buildings with clean surroundings, and never give them any milk to drink from that old herd unless it has been properly pasteurized. Gradually those calves are growing up to healthy animals and the old herds are dying away.

We are endeavoring also to promote better conditions of farming but I will not go into that here.

I want to say to the cheese makers and butter makers of Wisconsin that you have a splendid opportunity to make a memorial for yourselves right in your own district. I remember going through a graveyard in Pennsylvania one day and saw a pathetic inscription on a tombstone. Someone evidently had pitied himself and written his epitaph before he had passed away,

"Here I lie in my grave and all my bones are rotten,
Remember me when I am gone, for I shall be forgotten."

Was it not pathetic? Now why not be building up for yourselves a memorial, right in the district in which you are located; a memorial in the form of greater prosperity? If one man, through his efforts, succeeded in establishing a cow-testing association, if he has succeeded in increasing the output of the herds in his vicinity an average of five hundred or a

thousand pounds per cow, if that man did that one thing he is the means of bringing into that vicinity an increase of five or ten thousand dollars a year. Is that not a memorial worth while?

I overheard a conversation at a cheese factory in our state at one time. The man receiving the milk was a genial, well-informed fellow. I was on the platform with him and the conversation was something like this, "Hello, Bill, how are you? Say, Bill, I wonder where Dick is going to-day." The next team drove up and the same kind of conversation. Now, would it not have been better if that man had said "Good morning, Bill, how is that alfalfa this morning?" "I don't know, it's all right in some places and in some places not so good." "Well, I told you you had better put lime on it. Have you tried it yet?" He drives away and he has had a seed planted in his mind. The next man drives up, "Hello John, got your barn fixed yet?" "Well, I have not had time to do that yet." "Your cows will give more milk when you get that barn fixed up." "Well, perhaps they will." He drives away, and has had a seed planted in his mind. A man cannot stand on the platform and put such thoughts in his patrons minds without serving his community and serving them in a splendid way. It is said in the Old Book "As a man thinketh in his heart, so is he." Let's put some good things into their minds to think about.

WEDNESDAY AFTERNOON SESSION

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

IMPROVEMENTS AT THE CHEESE FACTORY

DR. J. L. SAMMIS, ASST. PROF. DAIRY HUSBANDRY, UNIVERSITY OF WIS., MADISON, WIS.

Mr. Chairman and Gentlemen of the Convention: At the present time there is in every line of business, whether in commerce, manufacturing, agricultural or mining, a distinct, a very marked tendency towards improvement. We are making a business of improvement. A few years ago there was less effort in this direction.

Once in a while a man happens on some improvement which he gave to the world and we were glad to receive it, but we did not make a business of looking for improvements as we do now. At the present time there are a number of men employed by the state and by private firms, by the breweries, by the iron works, by other industries, by the big stores, all looking to see where each line of business can be improved and how this can best be done. The search for improvements is becoming a business by itself, and that is a thing that I want to bring to the attention of the younger delegates here. It is not only your business to make good cheese and to do your daily duties well, but it is also your business to be looking for improvements. How can you make your factory better and your work better next year, than it is this year?

There are many signs that conditions are improving in the dairy business. A recent report from the Dairy and Food Commission states that we are making one-third more cheese in Wisconsin than we did five years ago, and there are about one-seventh more cheese factories, eight cheese factories now where there were seven five years ago.

There are something less than four pounds of cheese per capita eaten in this country each year. That is not very much; it is not enough to make the consumer sick. They

would be stronger, healthier, fatter and wiser if they would eat more cheese. I am sure you will all agree that there is plenty of room in which the cheese industry may grow, if only we do our work well. During the last twenty years, many improvements have had the cheese factory as their center. I believe you will agree that one of the most important steps in the inprovement of cheese making in this state was the founding of this association. Perhaps the Cheese Makers' Association and its annual meetings have done more to bring the cheese makers together and spread the good news that have come out from year to year than anything else. I do not believe the men who published bulletins, newspapers or anything else would want to claim a greater or more influential agency in the improvement of Wisconsin cheese than this association has had. We are all proud of it. We owe a great deal to the men who, twenty years ago, made a small beginning in this association, and who have worked for the success of its programs, who have written the letters and done the business to keep the association going since that time. We are to-day reaping the benefits of their successful efforts.

A good many other steps forward have been made. It is only a little more than twenty years since the Babcock test was invented. About five years later, the Marschall rennet test came out. About the time the Babcock test was given to the world, the Manns' acid test was first described by Dr. Manns, who was then at the Illinois Experiment Station. Those events stand out like great landmarks in the cheese world. They were great and remarkable accomplishments, noteworthy deeds, far above the ordinary events of every day in importance.

Not only has the number of cheese factories and the output of cheese increased, but the methods of making cheese have been improved, and the quality of Wisconsin cheese has improved. I think there is no doubt about that in the minds of men who knew the cheese industry twenty years ago. Improvement in quality is more important than improvement in quantity. If we make poor cheese, the more of it we have, the worse off we are; but if we make good cheese, the more we make of it the better off we are. The quality of cheese is the first thing to look at. It is often impossible for a given

factory to increase the quantity of cheese made, but the quality of cheese very often might be improved, if cheese makers and patrons would go at it in the proper way.

What are some of the ways by which we can make improvements at the cheese factory? How can each one of us start to make some improvement at the present time? If we think just a moment of how other people such as the big business firms manage their business, we can get some useful lessons. Take, for instance, one of the big retail stores here in Milwaukee. If you enter one of those you will perhaps see at the door an usher. Inside you will see a floor walker and a number of clerks. Then there are numbers of other people down stairs where you do not see them, packing or unpacking goods, perhaps making goods to sell. There are buyers in New York and Chicago at work for that store. In the office there are bookkeepers, who do not sell goods, or buy goods, or make anything for sale, but keep an account of what is bought and sold. In addition to the salesmen and all those other classes of workmen there is the business manager. You do not see him hustling around all over the store, like the clerks, and others. In fact, he apparently does not do much of anything, except at certain important moments when he steps in and says "You men stop doing this and go to the other end of the building and do something different." Once or twice a day the main body of the people in the store will hear from that manager. He says to the buyers "Buy less of this material, and more of this other kind," and to the salesmen he says "Raise the price on this particular article," and so on. It is easy for us to do the things that have been done for twenty years, but it is hard for us to realize that times come when things have to be done differently. It is a difficult thing to understand, sometimes, that we ought to make some change in what is going on at the cheese factory.

If you will compare the cheese factory with this big store I think you will agree with me that the cheese maker must be good all around. The cheese maker is the buyer; he is the man who has to look over the raw material every morning and see that it is of good quality. Oftentimes he is the salesman. He makes the goods that he offers for sale, often he is the bookkeeper. This one man does all these different

kinds of work. It is also his duty to be the business manager, and if he works as business manager but five minutes a day, this is the most important part of his day's work. What are his duties as business manager. To look over things about the factory carefully, think them over, and see where there is need of change and improvement. If you as business manager look the work over in the factory critically you may find several things that need improvement. In the intake, after carefully inspecting the milk as it comes in every day, would it be for the advantage of the factory if you could leave out Tom Jones' milk, every day? Has he the filthiest milk that comes to your factory? If so, how can you show him that that is the case without offending him? How best can you get him to clean up his cow stables, build a suitable tank for cooling milk, and how best to keep the milk clean and sweet? That is a fair question for it is your duty to help him all you can. There are late improved ways and appliances for examining milk. We have had the curd test for a number of years. Then there is the new sediment test. In operating this latter test, about a pint of milk is filtered through a piece of cotton, and any dirt that may be in the milk will remain on the little cotton disc. This is a very quick and simple way to show the patron whether his milk is clean or unclean.

There are some other ways to improve conditions at the cheese factories. Many farmers of the state are interested to know whether dairy farming pays better than grain farming, tobacco raising, or some other kind of farming. Some farmers have general farms, keep a few cows, raise some grain, and so on, but they could not tell you which line of farming pays the best. If they were convinced that well managed dairy farming brought in the most money, they would naturally want to keep more cows. It will improve the cheese factory business if the cheese maker will take the trouble to show patrons how they can produce more milk on the same amount of acreage, how they can improve the herd, how to test the different cows in the herd and know which are giving the most milk and which are not paying for their keep. By so doing you are simply working to your own benefit and the benefit of the cheese factory in helping the farmer build up his dairy herd. You will be able to show the people of

your locality that it is better to have one good cheese factory, well managed, than to have two or more small ones, none of which is well supported or managed. The large cheese factory can well afford a skilled cheese maker, modern up-to-date apparatus, which invariably result in a better product, selling at remunerative prices.

This association has for twenty years advocated the use of the Babcock test instead of the pooling system in payment of milk delivered to the cheese factories of the state. Still we have some factories that are not as yet paying for milk on the milk fat basis. It is of course to their disadvantage.

This is one line of improvement that I think ought to be especially emphasized. Patrons are much better satisfied to be paid by the test system than by the pooling system when they learn to understand it thoroughly. It is only when they do not understand fully the facts underlying the testing of milk that they insist on being paid by the pooling system.

If all the milk brought to a factory tested alike there would be no difference between payments by the two systems. The test varies among different patrons at every factory. At some factories the test will vary from 3% to 4.9%, while at others the tests will vary from 3.2% to 3.5%. The difference between payments by the pooling system and payments by the Babcock test system will be greater in proportion as the test varies from the average test of all milk delivered to the factory. That is, a factory where the average test is 3.5%, if a patron delivers milk testing 3.5%, he would get the same price for his milk by either system; but if the average test was 3.5% and the patron's milk tested 4%, then he would get 14 cents on the dollar more by the Babcock test than by the pooling system. How do we find that out? If we take the 4% and the 3.5%, the latter being the average factory test, dividing one by the other we will get $1.14, which means that the patron would get $1.14 by the Babcock test system for every dollar which he would receive by the pooling system. Take another patron whose average test is 3%; divide 3% by 3.5% and you will find that the patron will get 86 cents, by the Babcock test system, whereas he would receive $1.00 by the pooling system. Again, a patron whose milk tests 3.6% if divided by 3.5%, the factory average, we will get $1.03, which means

that for every dollar the patron gets by the pooling system he would receive by the Babcock test system $1.03.

I have been asked a good many times how much difference there was between payment by the fat test and by the pooling system, on the average, at different factories. The only way to answer this, is to figure out the difference found at a number of factories. This has been done at nine factories in Wisconsin, three in Sheboygan county, four in Wood county and two in Richland county. The milk at those factories was correctly tested by a skilled man sent out to do this work by the university. In the following table the factories are designated by letters, A to I, and the number of composite samples tested at each factory is also given, the total number at the nine factories being 475. The difference was then figured for each patron at factory A between his payments figured by the Babcock test and also figured by the pooling system. This difference was greater for some patrons than for others, but the average difference at factory A between the two methods of payment was found to be 3.4 cents on the dollar. The difference at the other factories varied, running as high as 8.8 cents on the dollar for factory G. The difference between payments to farmers for milk by the pooling system and by the test was found to be 6.19 cents on the dollar, on the average among the 475 payments covered by the study.

Average Difference at Each Factory Between Payments by the Pooling System and by the Babcock Test.

Factories	A.	B.	C.	D.	E.	F.	G.	H.	I.	A to I.
Number of Payments	27	39	48	77	102	70	48	24	40	475
Average difference between payments by the two methods, in cents on the dollar	3.40	4.58	4.95	8.11	5.93	5.03	8.81	8.06	5.87	619

Recently another proposition has been brought out, namely, that milk should not only be paid for on the butter fat basis, or milk fat content but also on its casein content. Every cheese maker ought to understand how the casein test is made and what it means so that he can tell his patrons how it works and what its purpose is. The average difference between pay-

ments by the fat test, and by the fat and casein tests, from 475 samples tested at the nine factories above mentioned was found to be 2.83 cents. In studying the figures it was found that with 60% of the 475 samples tested the difference was less than 2 cents; but on 40% it was 2 cents or more. In 11% it was 4 cents or more.

Prof. Emery: I am very glad that this discussion has occurred here because I think this matter of testing, this matter of giving back to the patrons their exact dues, just what belongs to them, no more, no less, is fundamental with all this line of dairy work in Wisconsin, and the indifference in getting that test and getting it accurately is reprehensible.

Some years ago, before the law was passed making it a misdemeanor to over-read or under-read the Babcock test, we found creameries where the butter makers were, in times of great confidence, admitting to our men that they had deliberately lessened one man's percentage and put it on another man's. No better than highway robbery! Why a man that would do that sort of thing should go to state's prison! The cheese factories and creameries in conducting their business with their patrons have to have first the patron's confidence, and the way to get that confidence is first to deal with every patron with exact justice, and the way to do that in handling the Babcock test is that the cheese maker and butter maker have to know how to do it, and they must have back of them a factor that says "Give those men their exact justice," and not a factor that says "You take from this man and give it to the other." I know we have touched on an exceedingly important part of the work in the dairy industry, and any emphasis that can be placed on the great importance of giving all those patrons their exact justice should be encouraged.

Those men that are handling the cows, that get up early in the morning and feed those cows, that milk them twice a day during the year, that water and feed those cows and see that they are in a healthy condition, free from disease, and so forth, and when they have taken all this trouble and concentrated this work into milk taken to the factory, they have a right to have returned to them what is coming to them, as much as the man that places his money in the bank has a right to have that money accounted for.

A very interesting talk on "Milwaukee, the Beautiful," showing many splendid stereopticon views of the parks, lake front and handsome residences was given by Mr. F. A. Cannon, Sec'y, Citizens' Business League of Milwaukee, which was much enjoyed by the audience.

SANITARY MILK PRODUCTION.

C. J. STEFFEN, MILWAUKEE, WISCONSIN.

Mr. President, Ladies and Gentlemen and Members of the Wisconsin Cheese Makers' Association: No profession requires more careful and more skillful mechanics, than does cheese making. No business demands more responsibility and intelligence. A successful cheese maker must be quick to think and act, especially so if he has poor grades of milk to handle, and expects to make a cheese which will command the highest market price.

No milk product requires purer milk than does cheese making or the manufacture of American cheddar cheese, and without question there is no profession or trade in my estimation, where greater miracles are wrought or wonders accomplished than in the manufacture of No. 1 cheese from an inferior quality of milk.

How to obtain pure milk, how to handle pure milk, how to educate the producer to produce clean milk, and the consumer to pay for clean milk and milk products are problems confronting every cheese maker and butter maker as well as health department officials.

The profits to be derived from the sale of milk and milk products has been the incentive to keep cows so to speak—and not the least the conservation of the fertility of the soil.

Wisconsin dairymen are without a doubt as progressive and wide-awake as can be found anywhere and yet statistics show approximately only 200 pounds of butter per cow per year as the average. Do you know that this means the average cow was kept at an actual loss to her owner? In other words she did not pay for the feed consumed at present market prices,

Some farmers will say, without giving the question serious thought, that is the reason we ought to have more for our products.

Let us see the logic of that argument. When butter goes above 35c per pound you curtail the consumption enormously and people refuse to purchase at those prices. When butter is high the oleomargarine man is in clover. What then is the remedy? Simply the breeding of better dairy cows, better care, and better care of her products. By breeding, by selection and environment we have brought about one of the wonders of the 20th Century—a cow giving twice her own weight in milk in one month, and producing butter approximating her own weight in one year. The giving of milk by the cow is more than commercial duty—it is a maternal instinct intended by the cow for her calf. How important then becomes our duty to our bovine mother to give her a mother's care, and by such treatment she will give us the greatest returns for the food she eats and labor expended in caring for her.

The opportunity for disposing of poor milk and unwholesome food is decreasing daily; many dairymen believe and preach that it is expensive to produce clean milk and clean food products. It is this class of dairymen who are still "keeping cows" just as their fathers did before them—same barns, same methods and practically the same scrub cows, and they believe they have nothing to learn. Nor will they discuss any phase of the dairy question only the price of milk.

If their arguments as to cleanliness being expensive were sound logic—our tramps ought to be a very wealthy people inasmuch as they spend nothing for soap nor are they at all concerned about their toilet.

The demand for clean milk is world-wide and is becoming stronger and more insistent every year. It is seen in the ordinances adopted by cities regulating the sale of impure milk, providing for country inspection, etc., and by cheese makers and butter makers generally making the same effort to obtain a clean milk supply as is followed by city inspectors.

The demand is not so much for richer milk as it is for cleaner milk—this demand is only a part of a general movement for more sanitary surroundings where people live and work, and for purer human food. Dairymen are not the only

food producers who are being called upon to observe greater cleanliness in the manufacture and care of the food they market. If any dairyman thinks his industry has been singled out for special and unfair attention, he should examine some of the recent laws affecting other food products. He will find that milk is receiving only a very small part of a general movement for more healthful conditions of living and for purer food.

The demand for better milk is the result of public education in the problems which are related to the public health. It is accompanied by similar demands along other lines—for pure water, more wholesome meat, unadulterated food stuffs, cleaner streets and the like. When produced and handled carelessly milk will not remain in good condition more than a few hours. It quickly ferments or sours and becomes unfit for the purpose for which it was produced.

The causes of these changes are no longer a mystery; formerly they were supposed to be due to Hollow Horn, Wolf in the tail, to thunderstorms and many other uncertain influences. These changes are now definitely known to be due to certain kinds of bacteria. When all conditions are favorable for growth, as they are in warm new milk one bacterium can form two in so short a time as twenty minutes. How important then becomes the necessity of prompt cooling.

Bacteria are found everywhere—many forms are useful, some are harmful. Cultures of certain useful bacteria are used in the process of cream ripening and manufacture and curing of cheese. The difference in flavor between different kinds of cheese is largely due to the growth of different bacteria.

Most bacteria found in milk, even in sweet milk, are of the beneficial or harmless kind. When present, however, it is direct evidence the milk has been exposed to contamination by harmful bacteria, since the milk was practically free from germ life when secreted in the udder.

The food required by bacteria is abundant in warm new milk, a few bacteria enter the teats, and for this reason it is well to discard the first few streams from each teat. It is a good practice to do this as the first milk taken from the udder contains very little fat.

A much more serious contamination of milk is likely to occur if the cow is diseased; the greatest care should be taken to keep cows in good health and exclude from the herd an animal that is not well. We must do this to insure the purity of our milk supply. We cannot afford to keep a diseased animal in the herd. Might as well overturn a lantern in the hayloft and not put out the fire—the result in the end will be the same.

One of the best preventatives of disease is abundant light and ventilation; most cow stables are too dark and close. Animals like human beings require sunlight and fresh air to enable them to keep in good health. Nature puts every living being out-of-doors; think of it for one moment—after we have huddled ourselves together in houses that had little to commend them except warmth, paying no attention to light, ventilation or proper sanitary surroundings; becoming sick under such surroundings, we again take ourselves to the open air, plain wholesome food and sunshine, and in a great num ber of cases recover our health.

Now cows are like human beings in this respect. They must have all the fresh air they can get; that means cows should have exercise every day. A romp in the pasture or yard will be conducive to better health, better appetite and more and better milk. Good ventilation in the barn is necessary also if you would produce clean wholesome milk. Michels in making experiments as to the effect of well ventilated barns as compared with poorly ventilated barns, got the following interesting data; the results are an average of hundreds of samples kept several days, examined every 12 hours.

Milk From.	Well ventilated stables.	Poorly ventilated stables.
Clean, natural sour flavors	93%	38%
Stable flavors	0%	45%
Stale musty flavors	0%	17%
Lightly ensilage flavors	7%	0%

It will be noted 62% of the milk showed a contamination rendering the same unfit for human food. Fresh pure milk is an absolute necessity, both from the standpoint of health of the animals, and the production of pure and wholesome milk.

The dairy cow must have clean wholesome food if we expect clean wholesome milk from her. Too many of our dairymen are trying to produce clean wholesome milk from hog-food—it can't be done. Dairymen don't try it! When we reflect, the human mother nursing her baby, can diet the infant by eating certain kinds of food; how important at once becomes a wholesome food supply for the dairy cow.

The cow tied in the barn is morally entitled to be kept comfortable and clean; that implies tight, sound floor and gutter not farther from stanchion or manger than 5 feet for average sized cow, the gutter not less than 16 inches wide, 7 inches deep, sloping slightly to one end and away from the cow.

A multitude of sins are covered up in the terms milking time, milk pails, milking; for too many of our dairymen it should be termed the time to put dirt in the milk. Remember the dairyman is to blame for the filth in the milk; the cow gives milk that is pure and wholesome. All or nearly all filth found in milk gets in during the process of milking.

No man ever milked clean milk from a dirty cow in a dirty barn; it can't be done. To determine what influence dirty cows had to do with dirty milk, and clean cows with clean milk, also what would be the difference in the bacteria count of these milks; milked in a three-quarters closed top milk pail, as compared with the common open pail. I selected two farms; one farm, cows filthy, not properly cared for, the other farm, clean cows and cared for under practical conditions, fed pure and wholesome food. The proprietors had no information of my coming. The cows were selected, one as clean as the other. One was milked in the three-quarters closed top pail, the other in the common open pail. These pails were both well cleaned and sterilized with live steam before using on clean as well as dirty cows.

A 4-inch Petri plate was exposed on side of cow immediately above the hands of the milker for four minutes to observe the amount of dirt or dust in and about the cow during milking. This was done on both farms, clean cow as well as filthy cow. After milking, each cow's milk was poured directly into 10 ounce sterilized bottles without straining; the temperature outside was about freezing. This milk was brought to the office. Bacteriological tests made of the same with the following results.

This milk was plated approximately 20 hours after milking and had been kept at a temperature of 35° F. slightly above freezing. Sediment tests also were made of this milk with the result that it confirmed the bacteriological test without a question, showing decidedly more sediment in milk from clean and filthy cows when common open pails was used as compared to three-quarter closed top sanitary pail. On the Petri dish exposed on the side of the dirty cow there was clear evidence as to why this milk contained 41,000 bacteria per C. C. as compared with the clean cow of 6,800 bacteria per C. C. The filth on the plate from the dirty cow was such as no person would care to have in his food supply.

The bacteria tests of the milk showed the milk from the clean cows and barn very free from filth and undesirable bacteria while that from the dirty cows had a tendency to run to spreaders—generally indicative of being produced under unsanitary conditions and contaminated with filth.

Professor Stocking of Cornell found 63% of the dirt and 29% of bacteria could be prevented by using small top or so-called sanitary pail.

Eckles of Iowa found a difference in bacteria count; 3,200 closed as against 43,000 open pail, corresponding very closely with my work and observations. Need more be said as to the necessity of using a small top pail? After the milk is drawn, prompt cooling is absolutely necessary. If we would keep down the bacteria count to the minimum, what would have been the condition of this milk after 24 or 36 hours if kept at a temperature of say 60° F. can be answered by referring to work done along these lines—it was found milk containing 2400 and 30,000 bacteria per C. C. and kept at a temperature of 55° F. after twenty-four hours contained respectively 18,000–187,000 bacteria. Kept at a temperature of 90° F. contained after 8 hours 654,000 bacteria per C. C.

Milk containing 92,000 bacteria per C. C. fair quality kept at a temperature of 90° F. contained after eight hours 6,800,000 bacteria per C. C. How important then is prompt cooling immediately after milking to 50° F. or below if we would keep down our bacteria count to the minimum.

How often when scoring butter or cheese entered in competition during the winter months we come across the following comments; too many entries were scored off due to barn

odor resulting from improper ventilation and leaving milk too long in the barn. It is hoped milk producers will wake up to the fact milk must be milked and cared for under clean surroundings if we would obtain best results. How many times is the cheese maker or butter maker blamed for inferior goods, and how often is he compelled to say, "Furnish me clean milk and good cheese or butter will result" you can answer better than I.

There is another reason why clean milk is a necessity, for our babies. It is now known definitely that milk from a cow affected with garget or other udder trouble does sometimes produce and excite tonsilitis as well as being absolutely unfit for food.

Think of milk full of dirt and filth taken into the stomachs of our babies! Do you wonder the cry is going up all over this land for cleaner and purer milk for our babies?

Holt in his investigations found that babies fed on average store milk—milk containing from 400,000 to 175,000,000 bacteria per C. C. there was an increase of 100% in diarrhoea and almost 400% increase in the death rate as compared with the same number of babies fed on fresh clean milk.

What a great lesson there is in this for the milk producer. How great is his responsibility for human life; what a wonderful field for conservation of human lives in this milk question when we think of it.

There is another factor not generally recognized in milk production. Do you know in my work inspecting more than 800 farms supplying milk to this city, it is always a pleasure to visit with the clean dairyman, the man who takes pride in his work. He takes pride in showing you everything he has got, the greeting you receive spells welcome in everything he says and does. He takes you about showing you a fine cow here, a nice heifer there; then his silo and his barns, finally to his milk house showing you where he cools his milk and washes his utensils and then tells you, "I expect to do still better."

Now, pride like that is worth dollars to that man, for the comfort and happiness it brings to himself and his family. What a pleasure it is to meet optimistic dairymen! Contrast him with the pessimist; he does not believe in anything, is

careless and his herd and premises generally speak louder than words.

Pride, comfort and happiness go hand and hand in the dairy as well as every other business.

The happiness, prosperity and future health of this nation is dependent on the man who produces clean milk.

DISCUSSION.

The President: Did you find difficulty in getting people to adopt the closed top pail?

Mr. Steffen: We are taking that up this winter and doing what we can to get people to use them. Wherever the closed top pail has been tried, if for no other feature than preventing the man from using the pail for various other purposes, it is good.

Prof. Emery: Your experiment showed it greatly reduced the bacteria count?

Mr. Steffen: It certainly did, even on the clean cows it reduced the bacteria under those conditions over 100%. In the dirty cows there were 41,000 bacteria with the open pail as compared with 7,000 in the closed pail. In the clean milk with the common open pail there were 7600 as compared with 3,000 in the closed pail.

Mr. Aderhold: How long does it take milkers to become accustomed to a pail of that character?

Mr. Steffen: We have a hard time in getting farmers to use anything that is not their own method. The wonderful thing about this work, gentlemen, was the fact that the sediment test corroborated the bacteria test in every instance. In fact the sediment test from the clean cow we had to hold for twelve hours longer before we could find the bacteria at all. We examine the bottom of the bottles to see if there is any sediment; and if there is no sediment, we run it through the sediment test and we send that back to the farmer with such comments as may be necessary. However, we carry that farther. We have an inspector in the country and when our state inspector gets these samples of milk he will get after them to see why Mr. Smith has those conditions and Mr.

Jones these other conditions. That is what we propose to get at, to see why those conditions are prevailing.

Mr. Aderhold: Would that be good evidence in court?

Mr. Steffen: I should think so. I heard recently in New York that a farmer was told his milk contained one and one-half millions of bacteria. Mr. Farmer walked around and said "I do not deny it, it may be true, but how long did it take you to count them." They think there is a good deal humbug about this.

Prof. Emery: With this sediment test will you continue the bacterial count?

Mr. Steffen: Yes, we will continue the sediment test from time to time, but you understand we take the sediment tests in the city and send them to the country and ask why a certain man has this condition while his neighbor has others and better conditions. Are there any further questions?

Mr. Baer: That is the very sort of work we have been doing among patrons of cheese factories, by making up curd tests and having the concrete examples on exhibition at meetings of the patrons of cheese factories, to pull a piece of curd open, to show the patron just what kind of cheese his milk would have made had it been made into cheese as one lot and not mixed with that of his neighbors. You have the same concrete illustration here that you can put before the producer of milk and show him just what his milk is like.

Prof. Emery: It seems to me that we have had an exceedingly important presentation of this wonderfully important subject. This is something that is available at a moderate price to every cheese maker, every butter maker and every farmer in the country, and I clearly understand that when I say to a patron "Your milk is not very good" the patron may say "I think it is as good as my neighbors." This sediment tester furnishes a means by which we can show to the eye the condition of that milk. It can be done quickly. Having the milk stirred and taking a sample out of it you have the average content of the milk. It is easily put through this sediment tester. There on this cotton you will find the sediment. Some samples of milk will make the cottton black, you see the filth, you see the cow manure. That is a concrete demonstration of the condition of that milk and if the patron can have that presented to him so he can see that is the

kind of milk that does not produce good cheese, that there is something in that milk that nobody wants, very much can be accomplished in improving the quality of cheese. I think this sediment tester should be a great boon to the dairymen and butter makers and cheese makers of this state and the other states, to educate us, to convince without offense, without controversy, of the condition of the milk. I was glad to hear the statement this afternoon that in all cases counting the bacteria confirmed the test made by the sediment tester.

Mr. Larson: I want to emphasize one point, that of giving and using the sediment test for the purpose of showing not only to the individual patron but to a number of patrons in the factory the condition of the various patrons' milk. There is nothing that will stimulate a patron quite so quickly as to show him that his milk is the dirtiest at the factory. I saw a man receiving milk at a station and making the sediment tests of the patrons' milk, and while he was testing he was talking about the dirty milk, and this made an impression on the minds of those furnishing the milk and they went home determined to produce better milk. I am certain if you will follow this out you will work a revolution in the production of clean milk at the factory.

Prof. Emery: Those patrons are very much in the same position as the lawyer who said "I am the smartest lawyer in the state." A fellow lawyer said "How do you prove that?" "I do not have to prove it, I admit it," Those patrons if you present this evidence to them see it and admit it and they will then help themselves.

THURSDAY MORNING SESSION.

Meeting called to order at 9:30 o'clock with President McCready in the chair.

CHEESE FACTORY SANITATION.

H. A. KALK, SHEBOYGAN FALLS, WIS.

Mr. Chairman, Secretary Baer, and Gentlemen of the Convention: We cheese makers must practice what we preach to our patrons, and be well educated to judge good milk from poor milk, and tell the patron where the trouble is and how to get better results. Our work must be above suspicion.

The first thing we have to do in the morning when we take in the milk is to see that our personal appearance is neat and clean and that we have a good smile on, as that goes farther with your patron than anything else. If you find any milk not extra, tell the patron so. If he comes the same way the next morning tell him that he is the man that will lose, if there is any loss. If he sees it in that light he will think the matter over and be a different patron.

Carefully inspect the milk cans, especially the seams inside the covers. Any offensive matter appearing yellow when wet with milk is most dangerous to the flavor and keeping qualities of the cheese. If I find cans like this I send a five pound bag of cleaner along with this patron and tell him how to use it. I always have some cleaning powder on hand. Examine daily carefully, for that purpose, the inside and outside of the opening from the weighing can in the milk conductor for any traces of the yellow matter. Wash the weight can and scrub the intake platform every morning as soon as the milk is all in. I always use a little washing powder to keep it fresh and clean. Wash the strainer cloth first in cold water, then in hot water and use a little washing powder, then hang it out in the sun to dry.

Entertain a "creepy dislike" for the use of a strainer, cloth, dipper, pail, thermometer, curd mill, starter-can, test bottles, curd knife or any other tools that you use in the fac-

tory, which feel greasy. If you find them so they are not sanitary.

The making room should be large enough so that you can turn around when you have to clean the corners. Have plenty of windows to get light, for it is light that we want; the more we get the easier it is to keep clean. I prefer a hard wood floor in the vat room. It is not so hard on the feet as cement and easier to keep clean. I oil my floor four times a season with linseed oil. It is easy to keep clean and sweet. The vat room should be painted, varnished or white-washed once a year, for the cleaner you keep your factory the easier it is to keep out flies. The windows and doors should be well screened. As our Dairy Commissioner said last summer "swat the fly." I guess he was right as every living fly is a crime against society. Consider for yourself the number of times you have seen flies feeding on sputum, on garbage, on filthy excreta. They dance and prance into our homes and kitchens and hold high carnival at the dinner table. They scrape their feet, rub their wings and drop their specks on our sweet cakes—yet we eat them. Do you like it?

In Denver during the fall of 1908 fifty-six cases and six deaths from typhoid fever resulted from milk along the route of one of the milkmen, whose milk was found contaminated with flies that had fed on typhoid excreta from an uncovered vault.

The life of a fly is about ten days. There may be twelve to thirteen generations in a summer and the progeny of a single fly may be a sextillion, at the end of a season. The easiest way to keep your factory clean from flies is to have close fitting screens on windows and doors to keep them out and use fly poison and tanglefoot for those flies you have inside. Use plenty of good washing powder and brush with hot water and willing hands will do the rest. Never be afraid of our inspectors, they are here to help us.

The whey tank is what is bothering many of us cheese makers that have a tank in the ground. As my factory stands in a low place it is hard to drain the left over whey up hill. Once a week one of my patrons has to haul the left over whey to a creek, then the whey tank is given a good cleaning with brush and hot water. Tell your patrons not to spill whey

when they are at the whey tank as that old whey will give a bad smell and is a breeding place for flies.

Keep everything outside, about the factory scrupulously clean, have a nice lawn, plant trees and flowers as this will help you to get fresh, clean air in the factory in the summer. When your doors and windows are open you all know how it feels to get a little fresh air. For it is the outside looks of your factory that is judged by strangers as they pass your place.

Finish all of every day's work, each day, in the very best way that you can, and don't grumble but face the sun.

Don't hunt for trouble but look for success,
You'll find what you look for, don't look for distress,
If you see but your shadow, remember, I pray
That the sun is still shining, but you're in the way.
Don't grumble, don't fluster, don't dream and don't shirk,
Don't think of your worries, but think of your work.
The worries will vanish, the work will be done,
No man sees his shadow who faces the sun.

DISCUSSION.

The President: Now, gentlemen, you have heard Mr. Kalk's paper on Cheese Factory Sanitation. He is a practical cheese maker and a good one, and I want you to ask him any questions that you would like to have answered along this line. Do not be afraid to ask any questions because that is what we are here for. Any questions you want to ask, Mr. Aderhold? I heard him remark we should not be afraid of an inspector, you are an inspector.

Mr. Aderhold: Do you find many open seams on cans or milk pails used by your patrons?

Mr. Kalk: Not very many because I always object to them.

The President: Mr. Kalk, you said you washed your whey tank once a week, do you think that often enough?

Mr. Kalk: What can a cheese maker do when the whey tank is hard to get at?

Member: Mr. Kalk is one of my neighbors and I believe by

scrubbing his tank once a week and rinsing it every day it is kept in good condition.

Mr. G. Marty: I had a pump in my whey tank and the patrons would pump the whey from the bottom and leave the cream or fat on the sides, and I had trouble in getting it out.

Mr. Aderhold: Have you had any experience with skimming whey, where you have to have pipes to keep clean?

Mr. Kalk: No, I have never tried that.

Mr. Aderhold: That is a new problem with the cheese maker. When they put in a separator to separate the cream or fat from the whey they have to use pipes. Something that is not often used and should not be used in a cheese factory work is a pipe, because in a cheese factory they have been able to get wide open troughs, which are much easier to clean, and I have noticed a number of cheese makers, when they put in their outfit to separate whey, they had to have pipes and did not know how to clean them. In many cases they thought they were clean and when they were taken apart they were found to be a long ways from clean. If there is anyone here that is accustomed to using those pipes, or any cheese maker that is accustomed to handling those pipes, I think it would be well to call on him to tell us the best way of keeping them sanitary.

Mr. Damrow: I do not know whether it can be done for I am not separating whey, but it occurs to me that the pipe could be made of short lengths and be unscrewed when through with skimming, rinse them out first and then clean them and run water through them. I think you can keep them thoroughly clean in that way.

Mr. Aderhold: What style of piping would you recommend to use?

Mr. Damrow: We want to get the best we can in that line, but where can we get it? Does anybody know?

Mr. Aderhold: You can get the ordinary black iron pipe, which becomes very rusty. You can get galvanized pipe, which is rough, or you can get what is called the sanitary piping, that is perfectly smooth inside and can be easily taken apart. It is made of seamless rock copper, tinned over inside and outside. In a cheese factory fitted for separating whey only a little piping is needed and I think it important that good sanitary piping be furnished. This can be bought at

any supply house and may be taken apart and cleaned and should be examined frequently so as to be absolutely sure whether it is clean or not.

Mr. Knutson: Do you pasteurize the whey in the whey tank?

Mr. Kalk: No sir.

Mr. Damrow: What advantage is there in pasteurizing the whey? Can anyone in the room tell me?

The Chairman: You would get a sweeter, cleaner whey.

Mr. Knutson: We also find the whey tank easier to clean.

Mr. Damrow: Is the feeding value of whey any greater by pasteurization than without?

The Chairman: That is a problem that has confronted the Canadian cheese makers a long time and I know Mr. Ruddick will take that up in his address.

Mr. Baer: Just one word, we have a yeast ferment not only in our Swiss cheese but in our American cheese and I do not think the whey should ever go back in the can in which the milk is delivered unless it has first been pasteurized, and the pasteurization of whey has wiped out that yeast ferment trouble in many instances in cheese factories. I am not speaking of the feeding value of whey but I am speaking of the improved quality of the product that the consumer, that you and I eat.

Mr. F. Marty: Years ago there was a process in connection with the manufacture of Swiss cheese known as the "hot whey butter process." After the cheese and curd were taken out of the whey, it was heated to 64 degrees R., I do not know how many degrees F. that would be, but I judge about 150. Then there was a starter added, or a sterilized culture, which contained the same bacteria as the commercial starter would contain. The whey was rarely heated up to 75 degrees F. During the time that was skimmed, the kettle was over the fire and the temperature went up to the boiling point, almost to 190 degrees F. During those days when that process was followed in the manufacture of Swiss cheese we had less trouble with any kind of gas than we have to-day in the manufacture of whey butter, either by the separator or gravity system. We found we had a purer article, the whey was in better shape, it was sterilized as well as pasteurized and if there was any trouble like gas coming up it was there only a

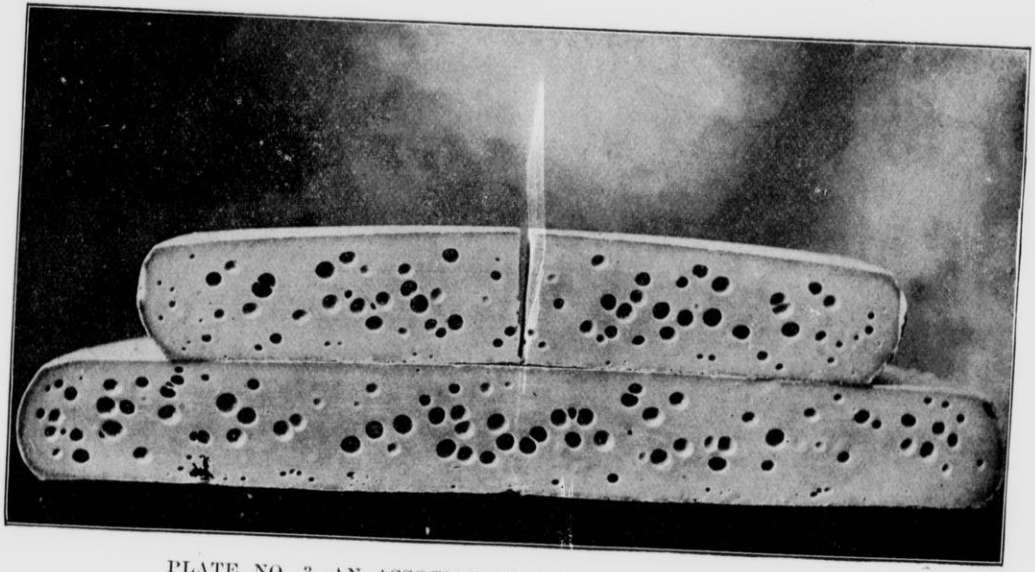


PLATE NO. 3—AN ASSOCIATION PREMIUM SWISS CHEESE.

As Fine as the Finest of Imported Swiss. Wisconsin is the Home of the Swiss Cheese Industry of America.

short time, one or two days and the trouble was over. To-day we find when one of those troubles start, like yeast fermentation, we have had it run five or six months, while in those days the trouble would not last more than three or four days at the outside and as a rule only one day. So there is no question that to insure the quality of cheese sterilization would be almost better than pasteurization for the sanitary part of it.

The President: There is no question but there is a good deal of value in the pasteurization of whey and we will no doubt have an opinion on that to-day when Prof. Ruddick is here.

SWISS CHEESE MAKING IN WISCONSIN.

GOTTLIEB MARTY, MADISON, WISCONSIN.

Instructor in Foreign Cheese Making, U. W. Dairy School.

At the beginning of the foreign cheese industry in the United States, Swiss cheese was made by the individual farmers wherever Swiss settlers were found, mainly in the states of New York, Ohio, and Wisconsin. They obtained good results and returns for their product. This encouraged the farmers and they began to coöperate and build factories, the result being that the industry grew so rapidly that it became difficult to secure enough cheese operators. Between 1880 and 1885 Ohio had the name of furnishing the most and the best Swiss cheese, but for some reason or other the Swiss cheese industry in Ohio received a severe set-back. The result was that quite a number of Swiss cheese makers in Ohio came to Wisconsin.

From that time on Wisconsin took the lead in the production of Swiss cheese and has maintained it ever since. The number of new factories increased very rapidly, especially in Green county and from there they spread in every direction. Swiss cheese factories were built in La Fayette, Grant, Iowa, Dane and Rock counties, and in the northwestern part of Illinois. In Dodge and Buffalo counties a number of Swiss cheese factories were also built. Between 1890 and 1900 on

account of patrons receiving better returns from butter factories and American cheese factories, the Swiss cheese industry did not advance, or rather the number of factories in operation decreased. If this decrease continues it will only be a short time until no Swiss cheese will be made in Wisconsin.

Almost every Swiss cheese factory in Dodge and Buffalo counties is now making either brick or American cheese. A great number of factories around Lancaster, Belmont, Darlington and Arena have also changed. Some are ready to change next spring. In New Glarus, the original home of the Swiss cheese industry in Wisconsin and in Monroe large condensing factories are in operation. According to reports other condensing factories will be established in the near future in what is now known as the Swiss cheese territory.

What has caused the relapse of this industry and who is to blame for it? Was it over-production or the results of poor workmanship and the consequent decrease in quality? There is only one answer and that is that it was due to the quality of the cheese produced rather than over-production, because there is now and always has been a large demand for good Swiss cheese. There has been an increase in consumption of the imported Swiss cheese. Severe competition on the part of our cheese dealers, poorly constructed factories, with insufficient facilities for curing the cheese and the lowering of the quality due to workmanship on the part of our makers, may be cited as the causes which have brought about the conditions existing at the present time.

One of the greatest evils is due to the buying of cheese over the shelf, paying the same price for a No. 1, No. 2, or No. 3 cheese at the different factories regardless of the quality of the cheese. This pernicious method of buying cheese has a natural tendency to encourage a maker to work for a larger yield regardless of the quality of the cheese produced.

Even a worse feature is the fact that it lowers the efficiency of our cheese makers. It is a very unjust method to the maker who tries to manufacture cheese of a good uniform quality, as under the present system he receives no more for his produce than his neighbor cheese maker who has taken advantage of methods of obtaining a larger yield at a sacrifice of quality. A good maker, therefore, is forced to follow suit or get out of the business.

Another evil is the poorly constructed factories in which the cheese is made. The chief objection to most of our Swiss cheese factories is that the curing rooms are too small and too warm. In many factories where they formerly received three thousand to four thousand pounds of milk per day during the flush, they were able to get good results as they had sufficient room in which to work. In too many of these factories they are now handling from 6,000 to 7,000 pounds of milk per day without the addition of any more room; consequently the curing room is filled before the cheese is cured. In order to get more room the older cheese must be piled on the cellar floor, three to four high. Only those makers who have worked under such conditions can realize the extra labor and trouble which this causes and the bitter feeling of disappointment experienced when a maker finds that he is unable to make cheese because of a poorly constructed factory.

Another evil which is much in evidence at the present time is a lack of interest on the part of many makers, mainly the beginners, in applying to their work modern methods such as are found in all up-to-date factories, namely the fat test, the acid test and the casein test. Strange to say, makers in our section who have made cheese for many years do not know how a Babcock test is made. In fact a great many never have seen a tester. Their excuses are that our best men make cheese without these tests, and no such tests are used in Switzerland. They forget that the old makers obtained their knowledge by long experience and also that in the old country all the breeds of cattle, climate and feed are more uniform than in this country. Consequently the fat and the casein content and the acidity in milk do not vary as much there as they do here. It gives me pleasure, however, to state that there is an increasing number of makers each year who are being convinced of the importance of these tests and who use them regularly in their factories.

One of the principal steps in the manufacture of Swiss cheese is the preparation of rennet. In Switzerland commercial rennet is not used, but dry rennets are digested in whey and the milk is coagulated with this solution. They also understand how to prepare this rennet so that it has sufficient strength and the necessary acidity. Consequently they are able to make good cheese. Many of our makers, chiefly the

beginners, do not understand the proper preparation of this rennet. Many cases of light gas fermentations in the milk can be overcome if the rennet used is in the right condition.

It would be a great help to our makers if they would adopt the fermentation case which is in use in Switzerland. This digestion case aids greatly in getting a uniform rennet preparation, which is an important item, as it has a great influence on the quality of the cheese.

It is also the custom there to add pure lactic ferment (which is furnished by the experiment station) to the rennet solution. According to the 24th Annual Report of the Dairy School in Rutti Zollikofen, a mixture of organic acid, invented by Dr. Steinegger is added to the rennet solution, which is a sure remedy for "Presserkaese" (pinholey cheese). About the middle of last June they had trouble with pinholey cheese at the dairy school, and after they had added the acid to the rennet solution, the cheese turned out normal. In a few days they again used the rennet without the addition of acid, and the pinholes appeared again. From that time on they used the acid supplement regularly with good results. This same trouble of pinholey cheese causes a great loss in our industry, and if our makers would get in connection with our experiment station, I am sure they would investigate these matters.

For the benefit of our industry, let me say that it is time that more interest was taken in adopting these modern methods. We must keep abreast of the times or be crowded out.

It is not too late yet to remedy these conditions, and I hope the reputation of manufacturing the best Swiss cheese in America will remain with us.

DISCUSSION.

The President: We have heard what Mr. Marty has had to say regarding the Swiss cheese industry. You will notice he said that there is less Swiss cheese being made than there was, not from the fact that there was an overproduction but because the quality had deteriorated somewhat. The quality is as important in Swiss cheese as in any other style of cheese. He also hinted that a great many factory men were injuring

the reputation of their cheese by working for yield, yield regardless of quality. Yield is the bugaboo of the American cheese industry in many cases and it seems our Swiss friends meet with the same difficulty. Any questions you would like to ask Mr. Marty? You do not need to confine yourselves to Swiss cheese alone.

Mr. Michels: I would like to ask Mr. Marty in regard to the use of organic acids. I do not see how they will improve Swiss cheese. Can you give some reason, Mr. Marty?

Mr. Marty: It is a secret preparation, nobody knows it but the school in Switzerland. We had some inspectors who delivered those acids from other factories and a number used them with good results. The same trouble started over there. We sent for it and had the same result and so it is in the report what that acid is.

Mr. Michels: Is there enough acid used to appear in the whey?

Mr. Marty: No, we add that to the homemade rennet. I suppose that the rennet gets more acid. You see in a good many cases while the homemade rennet may have the strength it has not the acid.

Mr. Michels: I can see how the addition of acid can check the development of gassy fermentations and I presume that acid is used to bring about that change, but would not lactic acid starter accomplish the same thing as far as checking the development of gassy fermentation is concerned?

Mr. Marty: To some extent it would but they used that lactic acid and it did not seem to help where the other did. He says they raised the acidity in that rennet to 7/10 and 8/10 % while in some cases the acidity in the rennet they used was only three to four-tenths per cent.

The President: What Mr. Michels is trying to explain is the fact that supposing you are using the rennet as the American cheese makers use it without the starter in the rennet, with the use of the starter would you not get practically the same result?

Mr. Marty: No, they tried for twenty years and once in a while would get a good cheese, but it was uncertain.

Mr. Fred Marty: I would like to answer Mr. Michels' question in regard to the commercial starter in connection with the manufacture of Swiss cheese. We can use a certain

amount of lactic acid in connection with the whey in the preparation of the whey that we use for homemade rennet, but if we go to a certain point we get away and run into a different cheese. The danger is for any man that is not an expert in the preparation of a sterilized homemade rennet. We find, as a rule, if a man exceeds or adds a little too much to that particular whey of his homemade rennet he runs into a glass cheese, and that is the reason the experiment station and dairy school in Switzerland, which have experimented for years, find they can control their manufacture only to some extent. This organic preparation must work differently against the things that produce the pinholes in the Swiss cheese.

Mr. Damrow: Do I understand from Mr. Marty's paper that they are using a casein test in connection with the butter test in some of the Swiss factories?

Mr. G. Marty: I think my brother can answer that question better than I. He comes more in contact with the factories than I do.

Mr. F. Marty: No, it is used nowhere at all. There are a few factories using the Babcock test but the casein test is not used at all.

Mr. Michels: Mr. Marty said sometime ago that he preferred the gravity method of separating the whey rather than the centrifugal way.

Mr. F. Marty: For the simple reason that the process brings the temperature to 185 or 190 degrees, naturally causes sterilization of the whey. If there are any gas producing germs in the whey and milk they are naturally killed off. I was called to a cheese factory where they had been having trouble for three or four months. They could not make a pound of good cheese, the cheese being sold for three, four and five cents a pound. They did not want to have an inspector come there and show them what to do but they got to the point where they stopped making for ten days and the farmers branched out into other factories, and the milk supply being short at that time of the year the cheese makers in the other factories were very glad to receive the milk. Finally they decided to try making cheese again and the trouble did not show up until four or five days after the cheeses were on the shelf. The trouble was the cheese usu-

ally started to huff and laid it wide open. Finally one day nine farmers and the cheese maker came to my house. They came on Saturday afternoon and requested assistance. I went out there and looked at the cheese, and I saw it was not yeast fermentation and I thought it must be caused by some stagnant water. We find very often filthy water causes trouble of that kind. I told the maker I thought it was because of the water and I asked for a drink, and when I saw the water I did not look any farther for the trouble. The trouble was there in the tank. I sent three samples to the experiment station at Madison to Prof. E. G. Hastings, who said the water was badly contaminated with organic matter. I told them to stop using the pump and, in answer to your question, Mr. Michels, I told the maker to go back one week to the old method of making whey butter. I told him to sterilize and cook the whey to take the albumen out of it, and the second day there was a different smell in the working utensils. The spout had a good clean flavor and inside of one day the trouble had ceased, and he has made No. 1 Swiss cheese from that day until to-day, and I know that the simple little thing of sterilizing the whey stopped that trouble.

Mr. Michels: The question was raised here a little while ago as to the value of pasteurizing whey at the cheese factory. I believe the greatest benefit that can be derived from pasteurizing whey is by preventing the spread of disease, and I think Mr. Marty offers pretty good evidence here that it is a very good thing to pasteurize the whey even though we sacrifice the fat to do it.

Mr. F. Marty: I wish there were more Swiss cheese makers here. I would like to confirm what my brother said in his paper that it is a fact that the Swiss cheese industry of Wisconsin, I am sorry to say, is tending to slip backwards instead of progressing and it seems to me these conditions ought to be changed. If I had some of the dealers here that are at the head of that industry, it seems to me I would say something to them right here. It seems to me they are not working for the benefit of the industry. It is a cut-throat game they are running up there and I believe if the Swiss cheese maker, regardless of what ability he has for the manufacture of a good Swiss cheese, if he endeavors to do so he can make a good Swiss cheese, or if he does not he will ruin himself.

That is the point we have come to. If a maker tries to make a good Swiss cheese, he naturally requires more milk to make one pound of cheese, but the dealer comes around, goes over the country in a dashing automobile, and will put in a bid for the whole lot, regardless of the condition of the cheese. He will buy by 'phone or any other way and he will lump the cheese, the same as the stock buyer will buy a bunch of hogs. You can talk cleanliness and improved methods but what can we accomplish under those conditions? Simply nothing. The cheese maker that tries to run good cheese to-day will run himself out of a job inside of six months. Bill over here has three cents more for a hundred pounds of milk than his neighbor and he is naturally a better cheese maker in the eyes of the farmers no matter what kind of trash he puts out. What has been the result? The importation of Swiss cheese has increased in the last fifteen years to such an extent that I think the importation exceeds the manufacture of Swiss cheese in this country. It is an item. Before the consumer of a pound of imported cheese can bite into that cheese he lays down to Uncle Sam six cents a pound duty on that cheese. There is a demand for Swiss cheese; people want it; they cannot get enough of it. Why cannot we do the work and reorganize our work? Why can't we get a set of dealers who are looking to the good of the industry instead of the almighty dollar immediately in sight? As my brother said to-day, we have centralizers cutting in on us; we have carloads of milk going from the midst of our cheese industry into Chicago. That means we have thousands of pounds of cream going from our little Swiss cheese district to-day. Four years ago our industry was expanding out into all directions while we have cheese factories in Green county to-day that are receiving thirty cents and forty cents a hundred for their milk. Does it take much to go out and induce the farmers to haul milk to those factories when they can ship it to Chicago and receive $1.50 a hundred? Even this is brought about because the qualifications of our cheese makers have depreciated 40% from what we used to have, and even if a cheese maker so desires he cannot make a good cheese because he would work himself out of a job. It behooves you all to come together on this point or we will ruin the industry.

Mr. Damrow: I think we will have to find some method of educating the farmers to see those points. I do not think we will ever come to get better results from the dealer on that question. We have to educate our farmers to see these points, that we have to make better goods if we want better prices.

The President: Do I understand that a man who makes good cheese does not get as much money as the man making poor cheese in the Swiss industry?

Mr. Marty: Yes, but in this way. The maker is hired by the farmers. Cheese factories in our section are coöperative. All the others are on the same basis. If I manufactured a bunch of cheese that is open but well cured, well made, good, substantial quality, goods that are equal to any imported cheese. Then we will say you have a factory, you take advantage of the conditions. You know what the dealers are. Well the dealers come over to my factory and put in a bid for the entire lot and I sell it to them. Then they go over to your factory. You have a different kind of cheese, you have a large yield, you make a cheese that does not bring out the characteristic points of a Swiss cheese, simply a big round cheese that has the appearance of a Swiss cheese. You have more pounds of cheese for the 100 lbs. of milk; but still the dealer is making a certain bid that day and you receive as much for your cheese as I did for mine, and you receive, ten, fifteen or twenty cents a hundred pounds of milk more than I do at my factory. The result is a farmer will say "Why, here over at that factory they received $1.35 or $1.40, while we only received $1.20. What is wrong?" Those fellows would not give a man any credit for making a good cheese, the farmer cannot see that when the money is not there; all he can see is the money and you will be known as the finest maker in the country because you made $1.35 for them. Those are the conditions and we are working backwards.

The President: I am beginning to think we American cheese makers are pretty good fellows.

Mr. Baer: I know that these conditions prevail, not alone among Swiss cheese factories of this state but also in the American cheese industry of Wisconsin and it exists among the butter makers too. It is a thing to keep away from, people. It is a mighty nice proposition for some people to put a pound of cheese, or rather a pound of water at the price of a

pound of cheese, onto the consuming public but the day is coming when the consuming public does not propose to pay 16cts. or 18cts. or 25cts. a pound for a Swiss cheese and get a pound of water at the same price. The consuming public will get away from that sooner or later. They do not propose to pay 40cts. a pound for water in butter either.

Mr. Ubbelohde: I would like to ask Mr. Marty whether they cannot sell their cheese on the call board so all the dealers would have a chance at them. It seems to me in that way they could overcome some of this trouble.

Mr. Marty: There is absolutely no reason why they could not do so. There is absolutely no reason why they could not get together and buy according to quality or grade of cheese. All this trouble would be eliminated if they would go out and buy No. 1, 2 and 3, make a variation between first and second grades, and the other conditions would naturally follow. It would mean more competent men than we have to-day, it would mean better equipped cheese factories, better curing facilities, etc., etc.

The President: Just before drawing this discussion to a close I want to come to the defense of some of the cheese buyers. As a cheese buyer, I was going to suggest, as Mr. Ubbelohde did, that a great deal of that difficulty might be overcome by selling your cheese on the open board of trade, and I think the suggestion a good one. I have bought cheese for a short time and I have yet to see the time when I will buy an off grade cheese for the same money as I will pay for a good cheese. I know other men right in this audience that feel the same, but our cheeses are based on board prices. There is no question but the man who works incessantly for quality will be the better man in the end. The man that works for yield always loses. Let him run into the hot weather and he will lose three or four cents a pound on his poor cheese, if they come to me or to anybody of average intelligence in Wisconsin, and that will take more than a pound of cheese per hundred of your yield. I think the American cheese dealers have done a great deal in the state of Wisconsin to improve the cheese. I put one or two fellows out of business and I stand ready to put one or more out. I had a man tell me to order supplies for his factory, who did not know the first thing he wanted for making cheese. I said

"What are you going to do?" He said "I am going to make cheese," I said "Don't you believe you are." Mr. Newman, a competitor of mine, can probably tell you where that factory was and where that man is to-day. That fellow would not turn out cheese that would bring within seven or eight cents of the market. Would we pay him as much for his sour cheese, his pinholey cheese as we would the man with the high quality cheese?

ITEMS OF INTEREST TO CHEESE MAKERS.

MR. T. A. UBBELOHDE, GLENBEULAH, WISCONSIN.
Editor, Practical Cheese Making Department of the Dairy Record.

Mr. Chairman, Gentlemen of the Convention: My subject is "Items of Interest." I will tell you first what I learned other people thought of us as Wisconsin cheese makers and dairymen and then I will tell you about some things that I found in this state among the cheese makers and cheese dealers. From outside this state we are looked at now as *the* cheese state. We produce more cheese and better cheese than any other state. I believe our cheese grades higher than that of any other country except, perhaps, Canada. I think Canada perhaps produces less poor cheese than we do.

Then our experiment station at the dairy school is held as *the* institution. I occasionally get letters from all parts of the country inquiring about our dairy school, letters from young men who want to go there. Wisconsin is an authority. It is not so long ago that Europe imported the art of cheese making to this country, while to-day we have young men come from Europe to Wisconsin to study the cheese problem. I met a young man last summer who came from South Africa to investigate our cheese manufacturing methods here, as well as our farming methods. He is going to spend three years in this country.

While we produce a great deal of fine cheese we also produce some poor cheese but it is just the same with our dairy-

ing. We have some of the best cows in the world, there is not a country in the world that has cows with the record of some of the Wisconsin cows. Not long ago we imported cows from Europe because we did not have them, now we have developed them and are ahead of all the other countries,—Mexico, South American countries, and Japan come here and buy carload after carload of Wisconsin cows and horses. But right alongside of those fine cows I have found in the country herds that would go less than 20 pounds to the cow right through the herd, scrub herds that should not be called dairy cows at all. Our experiment station cannot reach all the farmers that keep those cows. It is the duty of the cheese makers when the farmers come to the factory to develop them. I know of one locality where cows in one herd give 60 pounds of milk right through the herd, and where there are other herds giving 20 pounds per cow. Right up in our county, in Sheboygan county, we have some good cows on every farm from the best producers in the world. We have some good cheese up there too. We have one cheese maker in Sheboygan county that collected all the honors in the country last year, but Sheboygan county does not turn out all good cheese. I have tried cheese in the warehouse at Plymouth. Every once in a while I would find a cheese ten days old with an old stale flavor. I have tried some cheese there, gone back two or three weeks afterwards, and that flavor would be a great deal more pronounced. This flavor is frequently caused by the whey standing in the whey tanks so long that it gets stale, and then we get the flavor in the cans. I have opened milk cans in the morning and smelled the old whey flavor right in the cans. If the whey were sterilized that would not happen. Then another reason for this is the starter got too old and wheyed off, which will give the same flavor. I do not think the dealers pay the same price for this kind of cheese.

Another trouble with some of the cheese is not sufficient time to firm the curd in the American cheese. Some of our factories take in milk at from 9:30 to 11 o'clock in the morning and try to make cheese that same day, but it cannot be done unless they work after dark. I have seen factories take in milk at 9:30 in the morning and the cheese maker be ready to leave the factory at 3 o'clock in the afternoon, had everything finished up. The milk has to have a certain amount of

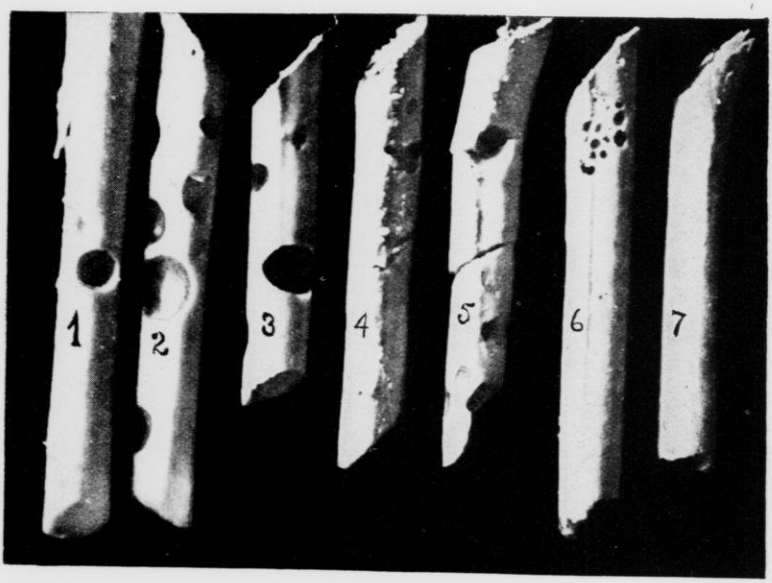


PLATE NO. 4—A SERIES OF PLUGS FROM SWISS CHEESES OF DIFFERENT QUALITY.

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

acid and if it does not have it, it will go off flavor. We do not need acid in the winter time but it will not have flavor unless a certain amount of acid develops, and unless you have the acid in the early process you cannot expel whey enough to get it dry and the dealers do not want water. You will get a big yield but you will be cut on the price, so you will lose money in the end every time.

I tried some cheeses last week that were seven or eight days old. They looked fairly good; the texture did not show any acid but you could not work the curd under the thumb at all. I tried some like that two months ago and tried it again the other day and it tasted sour. The cheese was not worth within three cents a pound the price of good cheese.

Out in Minnesota the cheese makers have not the same opportunity to make cheese that we have, because if you criticize the farmers out there they will put in a hand separator and ship their cream to the centralizers, while in this state the cheese makers have some chance to bring the farmers to their standard. The farmers in Minnesota own the factories and some of the farmers out there who owned stock in a certain factory took their milk somewhere else because the cheese makers found fault with the milk. In our state they have to go to the cheese factory and if every cheese maker insisted on good milk we would soon bring the farmers around to the point where they would produce good milk.

DISCUSSION.

Mr. Kalk: How long do you think it should take to make a good cheese, from time of setting until it is in the hoop?

Mr. Ubbelohde: It should take from twenty to thirty-five minutes for the milk to coagulate; then you need two and a half hours to get a well firmed curd. If you rush the curd you will not get as good a yield as if it is given plenty of time to firm slowly, but in some localities it takes longer to firm it than in others. Then you have to give it time to mat afterwards. Do not hurry it if you want a good flavor. Then you want to have it mellow down. The time that this will require will vary with the season of the year, but it is neces-

sary to give it from one to one and a half hours to mellow before you salt it.

Member: Does the amount of rennet acid used have any bearing on the time it will take?

Mr. Ubbelohde: You should have only about 1/8th of an inch, or a little more, to get the best cheese, about that much acid in the test.

Member: I am referring to a rennet test. How ripe should the milk be to set?

Mr. Ubbelohde: We find a variation in those tests. We have had the best success in setting our milk when the acid test has shown about 18/100ths. That may be 2½ or 3 by the Marschall test. With the acid test it does not make any difference what the temperature of the milk is.

Mr. Fred Marty: You referred to 2 to 2½. If you have over-ripe milk what will you do?

Mr. Ubbelohde: I was speaking of normal milk. If your milk is overripe of course you have to do everything to get it out in time so that the curd is firm by the time it shows the acid in the whey, because if you run too much acid in the whey you will have a sour cheese. I have spoken of normal milk; I do not think we should take overripe milk very often. It is a very easy matter, if you are using the acid test, to have every thing ready, then take a sample of the milk if you think it is overripe. Just draw out enough milk, have your neutralizer and indicator in the cup and drop in your milk. If it shows pink it is all right. If it remains white you can tell in a moment and in that way refuse overripe milk. I would not take it in if it showed over 2/10ths.

Mr. G. Marty: Has not the condition of the milk as much to do as acidity in milk?

Mr. Ubbelohde: Sometimes you cannot tell about pinholes. They have to be pretty bad to discover them. Sometimes we cannot tell they are there until we make up the cheese and they show up the next morning, but as far as gassy fermentation is concerned your milk will work slower, but the acid test will indicate whether your milk is overripe or not. I prefer the acid test because the cheese maker can take a sample right away and know how ripe the milk is and work accordingly. If there is yeast fermentation in the

milk it will not ripen as fast. The acidity will not develop as fast in that milk as milk free from yeast fermentation.

Mr. Damrow: Do I understand you to say that you would not take milk with more than 2/10th% acidity, or if you take milk with that acidity will it work two hours from setting to dipping?

Mr. Ubbelohde: If you get much of that milk it will be ready to dip before that.

Mr. Damrow: What would be the result if one added the starter and take in such milk? Do you think it would be possible to overcome that ripening in say from 500 to 600 pounds of milk?

Mr. Ubbelohde: If you took in that milk and added the starter, expecting your milk would average about 17/100ths acidity, then took in 500 pounds of milk showing 20/100ths% acidity, that milk is fairly under way where it will rush things along and that is where the trouble will be. You have to hurry it along so fast that you will injure your yield, your cheese and everything. Just as soon as you rush cheese along you are bound to ruin the yield. It may have more water in the start but if you hurry it along you will injure the yield.

Member: How much starter do you advocate using?

Mr. Ubbelohde: That would depend on the condition of the milk and the locality. In some localities milk will work faster than in others. In some factories I have seen 1% of starter used while in other factories ¼ of 1% was enough. The only safe way is to start with a small percentage and then gradually increase it until you are on the safe side. It is better to go slowly with the starter than to overdo it. If the starter gets ahead of you you will lose entire control of it so you cannot mat your curd, and you would have to dry it right off and salt it. Consequently the right way is to start in with a little starter and add a little more as you go along. Each cheese maker will have to decide that for himself.

Member: Do you use the same acidity the year round, that is 18/100ths%? If not, why not?

Mr. Ubbelohde: No sir, we do not, because there are times that milk will work more slowly. In the fall when the milk has got near the freezing point all the lactic acid germs in the milk are gradually destroyed, and then we depend en-

tirely on the starter. It is neccessary to run a litle more acid before it is set in order to have it come right along. We find sometimes in the spring, when the cows have freshened, that the acid will develop faster than in the fall. You cannot lay down a cast iron rule for that, every factory has to decide that for itself.

Mr. G. Marty: By looking over the entry blanks at Madison we find the cheese makers, in response to the question as to what condition the milk arrives in, that say "The milk was old in flavor" received a higher score than those that simply said the milk was good, and that shows a number of cheese makers in the state know the condition of the milk before they add the rennet. The main thing is to be careful at the intake as the tainted milk causes more trouble than does all the overripe milk.

Mr. Ubbelohde: I understand in talking to the cheese dealers, that the greatest amount of poor cheese in our country comes from the cheese dealers who stay home. Some cheese factories send their cheese to the dealers, do not put it on the board; the cheese makers never come down here, never go to a Farmers' Institute, and those are the ones that the dealers tell me send the poor cheese, while the cheese makers attending these meetings have comparatively little trouble. When we come together and talk with one another we receive mutual benefit. One of the reasons we are having so much trouble here in Wisconsin is because those fellows stay at home. They are doing all they can to injure the other cheese makers.

Mr. Damrow: I think we ought to get together and make all the cheese makers sell on the open board. If we sell our cheese on the local board the dealers are willing to come there and buy the cheese. It is up to us to educate the farmer.

THURSDAY AFTERNOON SESSION.

Meeting called to order at 2:30 P. M. by President McCready and opened with music by a male quartette, which was roundly encored. Mr. Brown, of Milwaukee, also entertained with a monologue.

ADDRESS.

ONE PHASE OF THE WORK OF THE WISCONSIN DAIRY AND FOOD DEPARTMENT.

HON. J. Q. EMERY, Dairy and Food Commissioner, Madison Wis.

Mr. President and Members of the Wisconsin Cheese Makers' Association: I esteem the opportunity of addressing you this afternoon as a privilege and an honor. You represent an exceedingly great and a very useful industry, an industry that produces a food extensive in quantity, of great variety, and in quality unexcelled in the world, an industry that in this state has grown from very small beginnings to vast proportions.

Speaking of the conditions at the time the Wisconsin Dairymen's Association was organized in 1872, Hiram Smith, whom to know was a liberal dairy education, once said, that Wisconsin cheese in the markets bore about the same relation to Eastern cheese that marsh hay does to early blue grass or timothy hay, and that the manufacturers had to leave it to be sold at the country stores, one or two at a place and replenish as sold; that mail carriers and peddlers disposed of all they could; and that at one time it was feared that the lightning rod man and insurance man would have to be called in to aid in disposing of the accumulating stock.

Contrast that situation with the conditions of to-day. I have been told by a goodly number of wholesale dealers in cheese that they can now place ten pounds of Wisconsin cheese on the southern and western markets where they can with difficulty, place one pound made in the eastern state that has

heretofore been Wisconsin's chief competitor. They tell me that Wisconsin cheese is a winner on those markets against all competitors.

In 1909, at the National Dairy Show in Milwaukee, Wisconsin cheese won first, second, and third premiums in all classes exhibited.

In 1910, at the National Dairy Show in Chicago, Wisconsin cheese won first, second, and third premiums in all classes exhibited.

In 1911, at the National Dairy Show in Chicago, Wisconsin American cheese won first and second; Wisconsin swiss cheese won first, second and third; and Wisconsin brick cheese won first and second.

In 1911, at the International Dairy Show in Milwaukee, Wisconsin cheese won first, second and third premiums in all classes exhibited.

At the nineteenth annual session of the Wisconsin Cheese Makers' Association at Milwaukee in 1911, Wisconsin cheese won first, second and third premiums in all classes exhibited, six other states competing.

Wisconsin is now producing in great variety and in quality unexcelled anywhere, upwards of 145,000,000 pounds of cheese annually for which the producers are receiving upwards of $20,000,000, not including any of the by-products.

These conditions have not been produced by mere chance. They have resulted from a combination of factors. I purpose limiting myself this afternoon to a brief presentation of one of these factors.

The initiative for the establishment of the Wisconsin Dairy and Food Department was taken by the Wisconsin Dairymen's Association. At its fifteenth annual session in 1887, the following resolution was adopted:

"Resolved, That this association ask of the legislature a law with proper police authority, to prevent the manufacture and sale of any form of adulterated cheese, for the pure article.

"That any adulterated cheese shall be branded and sold for what it is. That any violation of this law shall incur a penalty of not less than $100 for the first offense. There must be a suppression of the practice of adulteration of cheese or the cheese industry of Wisconsin will suffer almost irreparable loss."

And at the sixteenth annual session of the Wisconsin Dairymen's Association in 1888, the following resolution was adopted:

"Resolved, That in the opinion of this association, the time has arrived in the history of the state for the passage of a law similar to that in existence in Minnesota, Ohio, New York and other states, and the providing for a dairy commissioner, whose duty it shall be to ferret out and prosecute all adulterations of butter and cheese, and the sale of the same, as well as other foods, and we respectfully ask the next legislature to enact such a law and establish such a dairy commission."

At the seventeenth annual session of the Wisconsin Dairymen's Association in 1889, the following preamble and resolution were adopted:

"Whereas, Imitations of butter are being sold in Wisconsin in violation of law, to the prejudice of honest goods. Cheese is being made in large quantities, robbed of its natural fat, filled with lard and other foreign fats, and not stamped as the law provides. Adulterated and impure milk floods the market of towns and cities, drugs are made useless, drinks made more poisonous and nearly every article of human food diminished in value by adulteration; therefore,

Resolved, By the Dairymen's Association, That as dairymen and citizens we hereby earnestly express to the state legislature our unanimous request for the passage of bill No. 444, A., providing for the establishing the office of food and dairy commissioner, and for the execution of all laws aimed at adulteration."

In his message to the legislature in 1889, Governor W. D. Hoard urged the establishment by the legislature of a commission, clothed with the necessary power and means for the suppression of the fraudulent manufacture and sale of imitation butter and cheese as well as the sale of adulterated, impure or diluted milk, and the widespread and rapidly increasing adulteration of the food of the people. He pointed out that the then existing laws on these subjects were practically inoperative, because there was no well established agency for their enforcement. He also called attention to the fact that the neighboring states were in advance of Wisconsin in this matter. He quoted facts and statistics to sustain his recommendation.

The legislature of 1889, by Chapter 452 of the laws of that year, created the office of dairy and food commissioner for the state of Wisconsin and authorized the appointment of two assistants, one of them to be an analytical chemist.

It was made the duty of the commissioner to enforce all laws that then existed or that might thereafter be enacted, regarding the production, manufacture or sale of dairy products, or the adulteration of any article of food or drink or of any drug; and personally or by his assistants to inspect any article of milk, butter, cheese, lard, syrup, coffee or tea, or other article of food or drink or drug, made or offered for sale within this state which he might suspect or have reason to believe to be impure, unhealthful, adulterated, or counterfeit, and to prosecute, or cause to be prosecuted, any person or persons, firm or firms, corporation or corporations, engaged in the manufacture or sale of any adulterated or counterfeit article or articles of food or drink or drug, contrary to the laws of this state.

I have quoted the foregoing resolutions and the recommendations of Governor Hoard and of the provisions of law prescribing the duties of the dairy and food commissioner to show that there was a need, a purpose in creating this office; that that need, that purpose was to prevent adulteration in cheese and other dairy products; and to show that the duties of the dairy and food commissioner were prescribed especially to meet that need, that purpose.

Some members of this association lived during the time to which I refer and have a personal knowledge of the conditions; but the greater majority of this association were later born and belong to a succeeding generation. For this reason it will be not only interesting but exceedingly profitable at this time to call your attention to those conditions so far as they related to the cheese producing industry of Wisconsin. In the first biennial report of the dairy and food commissioner of this state, in 1890, I find the following statement under the subject "Cheese":

"Sixty million pounds of cheese is annually made in this state. There is not an article of commerce that requires greater skill in handling in order to secure favorable markets. No industry has been so perverted. No business exists that has been so falsely manipulated, and no article of food has been so degraded by counterfeiters. In no time has the honest manufacturer met with such dishonest competition. Matters have come to such a pass that the genuine article is under the ban of suspicion at home and abroad. The result has been that the subject has been thoroughly investigated by importers and steps have been taken to reduce the exportation of filled cheese from the United

States. The following letter explains very clearly the action that has been taken in England regarding this matter, and how the nefarious business is regarded by the commissioners of the several states:

The Liverpool Trade Association and Exchange Company, Limited.
Secretary's Office, 24 North John Street,
Liverpool, March 26, 1890.

Dear Sir—We desire to inform you that a committee of the undersigned has been appointed by this association to watch the interests of the cheese trade, which are being seriously menaced by the continued increase in the manufacture of the article known as 'filled' cheese.

We desire to coöperate with you in the direction of obtaining such legislation as will lead to the suppression of the manufacture of this article.

The legitimate interests of the 'Trade' are seriously imperiled, and the reasonable expectation of the consumer disappointed, and we are clearly of opinion that distribution of 'filled' cheese is disgusting the British public with the pure article, and that our Trade and mutual interests are in danger of suffering a permanent and lasting injury.

We are in communication with our Home Sanitary authorities, and are placing the matter before our Agricultural Government department, and members of the House of Commons.

We venture to suggest that you call upon your government and state legislatures to prohibit the manufacture of these goods.

We would ask you to inform us what steps are being taken on your side, and what course should, in your opinion, be adopted to bring about the end we have in view.

We await the favor of your reply.

Yours faithfully,

W. Carson,
A. W. Dunn,
J. L. Grant,
C. Holland,
T. Lonsdale,
Samuel White,
J. S. Harmood Banner, Secretary.

To H. C. Thom, Madison, Wis."

To present with still greater force and clearness the conditions as they existed at that time, I quote the following letter from J. L. Harmood Banner, Secretary, The Liverpool Provision Trade Association and Exchange Company, Limited, Liverpool, England, dated January 8, 1890, and directed to Thomas H. Sherman, Esq., American Consul, Liverpool, and

published in the first report of the dairy and food commissioner of this state, 1890:

"Dear Sir:

The directors of this association respectfully wish to draw the attention of your government to the exportation from the United States to the United Kingdom of what is termed 'filled cheese.'

This article is a compound of skim milk and grease, such as old butter, oleomargarine, or lard, the favorite ingredient being at present stale butter, on account of the belief of the manufacturers that they can thus defy the analyst.

My directors believe that this product is exceedingly harmful to the dairy farmers of your country. It is not the natural product of the cow, known as cheese. It is a well known fact that, for the past five years, since this fraud has been practiced, the price of pure cheese, instead of advancing in the spring months, has steadily declined.

This product is neither wholesome nor palatable, but is injurious to the American cheese trade, as it curtails consumption of the pure article, disgusting the community with American cheese as an article of food.

We believe the true remedy lies in prohibiting the production of filled cheese, which is manufactured in the western states, chiefly in Ohio, Illinois and Wisconsin. We are informed that New York state has prohibited its production.

We ask you for your assistance in this matter, and trust you will not only put this matter in the hands of the government, but suggest they should draw the attention of the dairy association and governors of the various states where this article is produced."

To throw still more light upon those conditions which it was the purpose of the law to remedy by creating the office of the dairy and food commissioner in this state, I quote the following preambles and resolutions adopted by the New York Produce Exchange, February 23, 1887, and published in the first report of the Wisconsin dairy and food commissioner in 1890:

"Whereas, Large quantities of cheese are being manufactured in some portions of the western states from milk from which the cream has been entirely extracted, by the separator process, and other animal and vegetable fats substituted for the butter so extracted; and,

Whereas, These goods are being almost entirely exported to Great Britain without being stamped or branded so as to distinguish their true character, and which are calculated to deceive; and,

Whereas, These spurious goods are working an injury to legitimate trade in cheese; therefore, be it

Resolved, That the cheese trade of the New York Produce Exchange deem it their duty to expose and discountenance such frauds by every means in their power.

Resolved, That we condemn the practice of adulterating cheese with

animal or vegetable fats as demoralizing and tending to create a prejudice in the markets of the world.

Resolved, That the attention of the dairy commissioners be drawn to the above resolutions, with a request that they do all they can to enforce the laws in regard to the make and sale of imitation cheese."

To set forth with striking clearness the disastrous effects of the filled cheese fraud in destroying the great British cheese market for American cheese which it had gained, I quote the following from the biennial report of Dairy and Food Commissioner Adams for the years 1895-96:

"In 1880, Wisconsin cheese sold in the English market at 1½ and 2 cents a pound more than Canadian cheese. In 1895, Canadian cheese was being sold in the English market at 1½ and 2 cts. a pound more than Wisconsin cheese. The reputation of Wisconsin cheese has been destroyed by the shipment of the spurious article along with good cheese. Canada, wiser than we, had prohibited the manufacture of imitation cheese, and by a careful system of government inspection and education in cheese production, had brought up the standard of her cheese and of her factory work to the highest point.

Exports of Cheese from the United States and Canada (for single years and yearly averages for five-year periods).

Periods.	U. S. Lbs.	Canada. Lbs.
1850	10,361,189	17,100
1860	15,515,799	124,320
1861–1865	35,081,855	473,550
1866–1870	47,432,602	3,750,224
1871–1875	90,688,546	20,114,561
1876–1880	113,606,609	40,676,856
1881–1885	118,813,685	61,502,949
1886–1890	88,303,513	83,737,133
1891–1895	75,977,114	135,679,207
1893	81,350,923	133,946,360
1894	73,852,134	154,977,480
1895	60,448,421	146,004,650"

Continuing the discussion, Commissioner Adams states:

"The dairy commission, which was established in the winter of 1889, had behind it no efficient state law for the limitation or prohibition of the business. * * *

The manufacture of this article became so profitable and so attractive that in 1894 it was estimated by the representatives of the State Dairymen's Association, by cheese factory inspectors, by commission merchants engaged in the purchase of cheese in Wisconin, that there were in this state two hundred cheese factories making filled cheese.

The State Dairymen's Association had been for several years thoroughly alive to the depressing character of this business in its influence upon the legitimate cheese interests of the state.

A committee upon legislation was appointed at a meeting of the State Dairymen's Association in the winter of 1894. This committee was strengthened by the addition of the entire executive committee, and the joint committee, at a meeting in September, 1894, appointed the present dairy and food commissioner (Adams) as a sub-committee to draw up a bill with the assistance of Mr. John M. Olin, an attorney of Madison, selected by this committee, which should prohibit absolutely in the state of Wisconsin the manufacture and sale of filled cheese.

After an investigation of the subject a bill was drawn up, which met the approval of the State Dairymen's Association, and which was a copy, almost word for word, of the law of Canada upon the same subject.

The multitude of evils which resulted from the development of the filled cheese industry had become so great that there was great public interest in this measure, not alone among the farmers of the state, but among thoughtful men of all classes, who saw that the reputation that Wisconsin had previously maintained in the markets of this country and Europe for the manufacture of good cheese, was being broken down and utterly destroyed by the sale in those markets of millions of pounds of a spurious article.

* * *

In the early days of the session, a lobby representing the filled cheese interests, appeared in Madison to ascertain the sentiment and temper of the legislature. The sentiment of the people of the state and their representatives was too pronounced and overwhelming to be changed or affected in any degree by any lobby which could be brought together. The filled cheese bill thus practically passed without opposition.

* * *

Since the law became operative, the dairy and food commission, although endeavoring in every possible manner to ascertain the facts, has not been able to discover that a solitary pound of filled cheese has been made within the limits of this state."

This was one of the effective lines of work of the dairy and food department.

The Wisconsin Cheese Makers' Association was organized in 1893. The conditions which I have been describing are what gave it birth, and as stated in the articles of incorporation, one of the objects is to demand a rigid enforcement of such laws as will protect the manufacturers of honest dairy products against competition from deceitful and dangerous imitation. Throughout its entire existence, this association has been strictly true to its purpose. It has not wandered away after strange gods. It has set its face strongly against adulteration and imitation and fraud and inferiority in Wisconsin

cheese. It has turned a cold shoulder to those who would beckon the Wisconsin cheese industry away from the straight path of honesty and integrity and into the paths of chicanery and deceit, and has always been a strong and loyal ally of the dairy and food department, heartily coöperating at all times with that department. Wisconsin having lost the English market through adulteration and deceit in the manufacture of cheese, this association was thereby taught once and for all time that the success of the producers of cheese depends upon the production of honest cheese of the highest quality. The lard and the rancid butter having been successfully squeezed out of Wisconsin cheese, this association will, I cannot doubt, always demand not only that those frauds but cotton seed oil and every other adulterant be rigidly excluded, and that you will continue bearing aloft your banner on which is inscribed the motto, "absolute purity and honesty in Wisconsin Cheese", so that not only 99% of Wisconsin cheese, but 100% shall be merchantable.

I rejoice in the high standard for the products which this association has always demanded and maintained, and I rejoice in the deserved prosperity which that high and honorable course has brought you.

Since the passage of the first law creating the office of the dairy and food commissioner and prescribing his duties as before set forth, the laws have been extended to define what constitutes adulteration in milk and other dairy products; what constitutes unsanitary milk and other dairy products; and has extended the legal function of the dairy and food department to the inspection of the sanitary conditions of cheese factories where milk is received and manufactured into food; to barns and premises where the milk is produced; to the utensils employed in the handling and transporting of the milk as well as to all places where food is manufactured or prepared or stored or exposed for sale or sold.

The legislature has, during comparatively recent years, made provision by law for increasing the membership of the dairy and food department until the present number comprises a force more nearly adequate for the performance of the many and important duties which the legislature has prescribed.

I have set forth the conditions which called for the establishment of the dairy and food department and have stated the purposes for which that department was established and the duties which were prescribed by the legislature for the accomplishment of those purposes. The law wisely provides that the cheese factory and dairy inspectors shall be expert cheese makers, skilled in the technical work of cheese factories, competent judges of cheese factory products and versed in modern scientific and practical dairy husbandry. In the performance of their duties as prescribed by law, these inspectors have abundant opportunities to give instruction incidentally in all phases of the cheese producing industry. No opportunity for such incidental instruction that does not interfere with the legal duties of the inspector is ever missed; and scarcely any cheese factory inspection is made that does not offer such opportunity. In consequence of this, technical and up-to-date instruction has been given in all the varied lines of the industry wherever opportunity has offered.

I come now to speak of some of the results estimated in dollars and cents of the work of the dairy and food department. In this as before indicated, I shall limit myself exclusively to one phase of the work, that which relates to the cheese producing business. I shall not undertake to speak of the amount saved to the consuming public of the state by the work of the department in the enforcement of the laws against counterfeit butter; nor shall I undertake to present the amount saved to the consumers of milk in the cities and villages of the state either in money or in health; nor shall I speak of the saving to the purchasers and ultimate consumers of linseed oil, turpentine, white lead and zinc white, nor will I discuss the savings to the great consuming public of the state by the aggressive enforcement of the food laws against adulterated and counterfeit foods which conservatively estimated and stated would require a number containing more than six figures. But, as before stated, I limit myself to a presentation of the results of the one phase of the work of the department relating to the cheese producing business.

A few weeks ago, desiring to formulate a statement that should concretely show the result of this line of work, and desiring to obtain as a basis for my own calculation the judgment and estimate of men most intimately acquainted through

their business and long experience with the result of the work of the department, inquiries were made from a representative number of wholesale dealers in cheese who have for many years been familiar with the cheese industry of Wisconsin, as well as with the cheese products of other states. They were asked to give a frank and candid statement as to whether the quality of Wisconsin cheese had been improved as a direct consequence of the work of the dairy and food department. The answer given in each case was in the affirmative. These men were then asked to give an estimate as to the minimum amount per pound that the producers of cheese in Wisconsin had received for their cheese more than they would have received, had it not been for the work of the dairy and food department. The minimum amount thus given was in the majority of the cases, 1 cent a pound. One firm gave as an estimate ¾ cents a pound. This was the only firm giving an estimate below 1 cent a pound as the minimum amount directly saved to the producers of cheese in Wisconsin by the work of the dairy and food department. Others gave more than 1 cent a pound as their estimate of the minimum amount saved.

What I believe to be the most reliable statistics ever obtained and published of the cheese produced in Wisconsin for a year were published in the biennial report of the dairy and food commissioner for the years 1909-10. That report shows that there was produced in the state of Wisconsin for the year 1909, 145,171,235 pounds of cheese. A saving of 1 cent a pound on 145,171,235 pounds of cheese amounts to $1,451,700 and represents the conservatively estimated amount of money saved to the producers of Wisconsin cheese by the work of the dairy and food department in the enforcement of the sanitary and other dairy laws of the state.

Wisconsin cheese producers having recovered from the prostration of the industry caused by the losses of markets consequent upon the production of a counterfeit and an inferior article, and having acquired the distinction of producing cheese of unexcelled quality in great variety, and having gained through its inherent merits highly profitable markets for its cheese on account of its high quality produced in clean factories from clean milk, it would be suicidal again to turn away from the path of rectitude which has led to such an exalted and prosperous condition. The history of the attitude

and transactions of this association in this matter is a guaranty of a continuance in the future of the course which has led to this high excellence. Organized and coöperative efforts for the accomplishment of such a purpose are wonderfully potent. Anyone who should pursue the course of a guerrilla or bushwhacker against the common good well deserves a guerrilla's or bushwhacker's fate. The wreckage of the cheese industry of Wisconsin, caused by the filled cheese guerrillas should be called forceably to mind whenever anyone seeks to produce and palm off upon the market an inferior or deceptive product.

Again I congratulate this association upon its honorable, useful and successful record. These annual meetings where the cheese makers of the state gather for a discussion of their mutual interests, where the most eminent authorities on the great cheese industry are secured to discuss the most important and timely subjects pertaining to the business, and where the products of your skill are gathered in competition, their relative merits to be determined by the honest and disinterested judgment of experts together with all these addresses and discussions and the results of these competitive contests gathered into a printed volume and distributed to the cheese makers of the state, and all this conducted from year to year with the highest loyalty to the business as a whole and not for the selfish exploitation of any individual, all combine to constitute a force of great potency for the cheese industry of our great state. An association with the purposes embodied in your articles of incorporation, working on such a high plane of endeavor, means progress and prosperity for the great cause.

At this point in the proceedings, the election of officers took place, the following gentlemen being thereby elected officers of the association for the ensuing year:

OFFICERS.

President—O. A. DAMROW, Sheboygan Falls, Wis.
Vice President—J. J. REID, Oconomowoc, Wis.
Secretary—U. S. BAER, Madison, Wis.
Treasurer—A. T. BRUHN, Madison, Wis.

DIRECTOR.

J. W. CROSS, Mauston, Wis.

ADDRESS WITH STEREOPTICAN VIEWS.

PROFESSOR J. A. RUDDICK, Ottawa, Canada.

Mr. Chairman, Members of the Wisconsin Cheese Makers' Association, and Gentlemen:

At the suggestion of your secretary, I am going to give a short lantern talk on some features of dairying in Canada, extending it into some other countries which I have visited. In these days, when dairy products are shipped all over the world, with trade routes well established which bring the ends of the earth together, we must look at this question from an international standpoint. I think that is an important thing. Sometimes we are too much concerned with our own immediate surroundings. Although the United States is not exporting very much (I see that you exported only about fifteen million pounds of cheese last year), the cheese makers here and the cheese makers in Canada should be interested in what is going on in New Zealand and other countries where dairying is an important branch of agriculture. If you will take a tip from me in this connection, you will keep your eye on Australia for that is the coming part of the world in dairying as far as international trade is concerned. They have a large country devoted to agriculture with a small population which is growing slowly, so they will have a large surplus for export. The United States is the largest dairy producer in the world, but you scarcely cut any figure in the international trade last year. You may in the future be of some importance as importers if things continue as they are going now. In Canada we are increasing our consumption also rather faster than we are increasing our production, and our population is growing very rapidly so that we are not likely to increase our surplus for export.

Professor Ruddick here proceeded to give a series of stereopticon views illustrating the dairying industry in Canada and other countries.

FRIDAY MORNING SESSION.

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

THE CREDIT SIDE OF THE DAIRY INDUSTRY.

F. E. FOSTER, MILWAUKEE, WIS.

The manufacture and distribution of cheese throughout this country, is so little thought of by the laymen, that I venture the remark that there are few people outside of yourselves and the larger distributers, who have the remotest ideas of the gigantic business you represent.

Even a brief review of the very illuminating report of Dairy and Food Commissioner Emery, of the wonderful advancement of your industry in this state, alone, would be educational to a high degree. I was deeply impressed with it; it read almost like a story of magic, so remarkable has been your growth. One can scarcely realize the amazing growth of the industry, which, he states, "is more largely permeated than ever before, with the spirit of the motto of our state: Forward."

In comparatively few years, your enterprising men, who are responsible for this great industry, have not only put Wisconsin on the map, but you have done more than this, you have made Wisconsin the first state in the Union in the manufacture of cheese and butter and have forced world-wide recognition, by making Wisconsin and Milwaukee international headquarters.

"Forward" is the word, and forward and upward all well directed and worthy effort leads, and who shall say that the enormous volume of over seventy-five millions of dollars annual production of cheese and butter in this state, shall not be doubled in the next decade?

All go forward together and in the same direction, but in one respect I am sorry to note, you are sadly lacking and fast going behind your more alert brothers in other lines.

I have special reference to what I am told seems to be a lack of knowledge or system regarding **The Credit Side** of your business.

While you produce over seventy-five million yearly do you realize this sum from your toil? Do you reap the harvest in cash, or its equivalent? I am told that you do not. I am further informed that you lose a great part of it by giving your merchandise away, or to better express it, I am told that you lose a great part of it by placing your merchandise and your trust in unsafe hands.

If this be true, it is very evident that you have no interest in and pay but little attention to the most vital part of your business, your **credit** department, or the **credit** end of your business.

As is generally stated, about 90% of all the business in this country is done on credit. Its influence and power are so great that its effect reaches from the greatest manufacturers to the humblest citizen.

In the world's work credit is indispensable. It advances the prosperity of the country and insures progress, so long as it gives judiciously and wisely. But if it be extended to persons unworthy, because of lack of character, ability, honesty or capital, the result is detrimental.

All dispensers of credit, therefore, should bear in mind that it is desired to curb the spirit of over-trading, over-buying, which always bring disastrous results.

The principles of credit to-day are:

1. To reduce loss.
2. To eliminate hazardous risks.
3. To conserve worthy interests.
4. To wage war on dishonesty and incompetency.

Competition in business of to-day is so keen, that profits in all lines seem to be constantly narrowing, and in view of this condition, we find that we cannot stand the losses we formerly sustained through failures.

The lines must now be more closely drawn, credits must be scrutinized with more care, and every precaution possible taken to eliminate those who are unworthy of your confidence.

It is probably well within the truth when it is said that no other line of trade has been so often and so badly "stung",

or, in other words, so often has been the "easy mark" for the dead beat and bogus commission man, that the cheese and butter trade has, and a large part of your 75,000,000 annual production, never comes back to you, chiefly because it is a well known fact that no line of business is so loose in its credits, as the lines you represent.

The losses in the United States in your trade run up into the hundred thousands annually, and they will continue to do so, until you see fit to put a stop to it, for you have the remedy in your own hands.

Your 75,000,000 are all right and you are all right in producing them, but, from what I am given to understand, you are all wrong on the other side, for, after producing them you leave them unprotected and open to all comers. You have no safety valve and therefore heavy losses follow.

Manufacturers in other lines are more careful; they protect their products and their credits by a special reporting service, devoted exclusively to their special line of trade.

Changing conditions in the world of commerce call for greater knowledge and skill along special lines, and we are now living in the age of the specialist, just the same as you, gentlemen, are specialists in the various products you manufacture.

The makers of brick, Swiss and Limburger cheese are specialists in their lines, just the same as the makers of American and other brands, are specialists in their lines. So, also, we have specialists in the law, in medicine and in almost every known activity.

This specializing has gone so deeply into commerce that your brothers in other lines now specialize in getting special information regarding their accounts and credits from special reporting bureaus devoted exclusively to their special lines. They do this because it is conceded on every hand that an energetic and centralized effort to report a certain line of trade by a specialist, must bring more satisfactory results, and be, generally, more productive of good, than were it reported along general lines.

Thus we have the dry goods, lumber, leather, millinery, boot and shoe, furniture, coal, hardware, tobacco and a host of other special reporting agencies, or bureaus.

These special bureaus flourish in all the large trade centers and they are well supported for the good and effective work they do for their members.

A special bureau of this character, it seems to me, would be almost invaluable to you, gentlemen, it seems to me that you are big enough for it; that many thousands of dollars that are now lost, in the open-handed way you seem to operate the credit end of your business, could be saved. It is a vital question, and one worthy of your deepest thought.

If I am correctly informed you seem to have manifested no interest in this regard, and you are seriously handicapped in the operation of your business by the lack of an exclusive source of trade information, and by the interchange of ledger experiences among yourselves. This would be a very simple and inexpensive operation, True, some of you use the old line agencies, but their work is general, their reports are not subject to revision unless over six months old, their methods are antiquated and their charge for service is prohibitive to many of you.

My suggestion for a special reporting bureau, operated in your own interests and for your sole benefit, is the result of a positive conviction that the time is ripe for its inauguration.

With the establishment of a bureau of this character your individual interests would be more safely guarded and thousands and thousands of dollars saved to you annually.

A bureau operated in your own interest would enable you to get a line on your customers and prospective accounts that could be had in no other way. It would enable you to learn in how many markets your customers were buying goods. Many times, **after** a failure and **after** you suffered heavy financial loss, it has been learned that goods have been bought in a dozen or more different markets.

Sometimes this is done through incompetency, but more frequently it is done through dishonesty and with deliberate intent to defraud. Had you known **before** you made that shipment, that your party was buying in many markets, you would not have lost that account. Information of this character is what an exclusive reporting bureau would provide for you.

Membership in an exclusive bureau would enable you to learn how your customer was paying in other markets, it

would tell you whether he was slow and going behind, information of great value **before** the goods leave your hands.

It would enable you to reduce your losses, to place your goods in safe hands, it would save money and anxiety and would be helpful to you in many ways.

In addition to these valuable and necessary features for the successful conduct of your business, such effective work could be done along the lines of adjustment. How many of you have lost money by shipping goods to parties in far distant cities, who, upon receipt of your goods, claimed they did not grade up right, or that they arrived in poor and damaged condition and forced you to settle **their** way and on **their** adjustment, and say so? Membership in your bureau would enable you to be represented on the spot by a fair and impartial inspector, acting in the interests of the bureau, **your** interests. Had you known, before making the shipment, that your customer was in the habit of rejecting goods with the view of forcing you to settle **his** way, and that he had the reputation of doing tricks of that character would you have made it?

The business of the bureau would be to gather information of this character and send it, voluntarily, to all members, so that they may be protected from unjust dealers. Information of this character would, alone, save you vast sums of money.

Some of you may have been misled, at times, by having your bank get information from another bank regarding a prospective account. While information from a bank cannot be said to be unreliable, it is, usually, not reliable enough to base credit on. There is a reason for this well known to many business men, as it is a well known fact that about the last thing a banker will do is to put himself on record, or make a written statement, over the banks signature, regarding the credit or standing of those upon whom he may be asked to report. Something like this is about what a bank will usually say in answer to an inquiry:

"Mr. Jones does business with us and we consider him a man of character and have confidence in him."

On the face of it, this information seems to be all right, but the banker does not tell you that Jones recently started in business, that he was formerly a carpenter and had no practical merchandising experience, he does not state that Jones

carries a stock of about $400 or $500 and that the money invested in the business was borrowed from his wife's brother.

The banker does not tell you that he answered seven similar inquiries regarding Jones to seven different parts of the United States within the past two days, nor does he tell you that Jones recently applied to him for a small loan which he refused.

Some of you may have been misled, at times, by referring to a rating book for a rating on your prospective customer. You neglected, however, to look at the front of a book to learn what date it bore. The book may have been anywhere from three to nine months old, and never less than three months old; and on this rating, taken from an old book, you risked several hundred dollars worth of merchandise.

Now let us see how much of a chance you have to guess wrong when you ship on this old rating. In the first place, information contained in current rating books of the old line agencies, is either gathered fresh or carried over from the last book, issued three months before. If it is "fresh" information it is gathered between the time of the issue of the preceding book and the current book; three months, which is pretty old information to risk several hundred dollars on, and yet it is done every day.

Now let us see what the old line agencies say about changes in business—both of the big agencies will tell you, and they do publish the fact that there are, approximately four thousand changes in business every day. Of course everyone knows there are more than this, as they do not get them all, but take their word for it, approximately four thousand changes in business every day. Now let us make some comparisons. They say their books contain a million and a half names. In these million and a half names, there are four thousand changes every day. Inasmuch as there are three months, or ninety days between the issues of every book, there must be ninety times four thousand changes, or 360,000 changes, according to their own statement, between the issues of any of their rating books. To state it plainer, in ninety days there is some change of some kind taking place in almost twenty-five out of every hundred ratings they print. It will be seen, therefore, that it is extremely dangerous to sell your goods on ratings taken from any book of refer-

ences. To do the agencies justice, however, it must be said that their rating books are not intended to be used as a basis for credit transactions. They are intended more as a gazetteer, or for convenience in picking out certain lines of trade or circularizing. The agencies invariably encourage special inquiry in every case, and call special attention to the fact that with so many changes every day it is unsafe to rely on their own book ratings. Yet it is rarely done and I must relate to you as an incident, in this regard, that recently happened to me. This is how I got stung for $12.00. We received a mail order from a certain concern in Grand Island, Nebraska. It was a new account to us, and upon referring to the latest reference books I found one agency rated them at from $75,000 to $125,000, and another from $35,000 to $50,000, surely these ratings should be safe to risk twelve dollars on, and yet they weren't, for before the bill became due they had failed miserably, owing large sums of money.

There is one agency that pretends to do business, and I am told has a large following, that publishes but one book of ratings every year—just imagine for a moment what you would be up against in making shipments on ratings over a year old.

Now gentlemen, the few words I have given you here, barely scratch the vital matter of **The Credit Side of Business,** and volumes could be written covering the science of credit management. If you are in a mood to accept a few words of advice I would warn you to scan your credits carefully this coming year—watch every point, and if you but do this, alone, you will save money for yourself.

It seems to me, however, that with your strong representation—not only in this state, but in adjoining states in the east—with all the wealth you command, you have everything to do with—it is important to you that you look into the exclusive credit service of your business. You have your local state and national cheese and butter associations and your other boards and associations, and the matter of an exclusive reporting service is worthy of your most serious consideration.

PARAFFINING CHEESE.

PROFESSOR C. F. DOANE, Washington, D. C.

Mr. Chairman and Gentlemen of the Convention: I want to take up a short general discussion of this subject, and might give you in this some facts that would be more or less interesting to you.

It is not known who first introduced the idea of paraffining cheese. I have met a number of individuals who claimed this honor. But I do not know that it is of much material difference. We like to give every man his just dues for bringing forth anything that is really worth while and yet what we are interested in at the present time is getting the most value out of the idea as we understand it.

It may interest you to know just how much this paraffining means to the state of Wisconsin every year. In looking this matter up I referred to the reports gotten out by the Dairy and Food Commission, and in my opinion, figuring on the basis of the shrinkage of unparaffined cheese, as shown by experiments in the United States; and considering that paraffining has stopped practically all of this loss, you are saving over a half million dollars annually in your state on the cheese paraffined, and it would mean considerable more to the United States as a whole. It is hard sometimes to estimate just what these innovations are going to mean in dollars and cents to a large community. It has not meant so much to one factory, or on the basis of a single cheese it scarcely seems worth considering, but figuring on the basis of the output of the whole state it amounts to a large sum of money in the course of a year.

The original reason for paraffining was to prevent the growth of mold. The older cheese makers, and perhaps many of the younger ones, remember in the days before paraffining that cheese gradually became covered with a very luxuriant growth of mold, which gave the cheese a very uninviting appearance judged from the standards of the present time. This would cause some work and cause some loss in scraping and cleaning. On the whole it was very undesirable. I might say in this connection that it is strange to say, while the American

consumers of cheese and everybody that has anything to do with handling the produce in this country, would never think of going back to the old way of handling it, I understand some of the English buyers demand the old moldy cheese. Is that so, Professor Ruddick?

Prof. Ruddick: Yes, they think they are too new if they are not moldy, but they are getting over that idea.

Mr. Doane: It is hard for us to understand why that should be. If you offered a moldy cheese in the retail market at the present time I do not think you could sell a pound of it unless to the older people. The newer generations would not touch a cheese like that.

The paraffining of cheese together with cold storage has almost revolutionized the industry in this country. Cold storage has, perhaps, been responsible for the greatest change, and the associated practice of paraffiining has introduced quite a number of problems that were not understood and did not have to be met in the old days. Chief among those changes with handling the cheese in cold storage has been the buying of almost new cheese. Years ago the dairy authorities of the country were talking about improving the curing rooms, getting a lower temperature, and still in some parts of the country you will see those old galvanized pipes of the sub-earth ducts sticking up in the air. I do not know whether many of those were in use in this country or not but those were the days when it was necessary to hold cheese a long time in the factory. With the advent of the cold storage each succeeding year has found the dealers accepting younger cheese, and I doubt very much if over one-fourth of the cheese that gets into the dealers' hands to-day in this state, is more than ten days old, in localities where the factory is close to the cold storage. Much of this cheese is only three or four days old, in fact in many cases they are sending cheese almost from the press. They are paraffining the cheese at one day old and sending it to the dealer. This is true of the scattered factories in Minnesota. Cheese comes from the press, is paraffined and is shipped off the same day to dealers in St. Paul. I have never known that to be done in this state though it probably is in a few factories.

This has brought changes. A good many dealers among the older men find it hard to adjust themselves to some of the

new conditions. They naturally thought cheese had to be cured in a dry room before it was fit to use; and now when the cheese is sometimes paraffined immediately from the press, or at three or four days old, you can see it is hard for them to understand just why this can be done. The faults that have naturally appeared in connection with paraffining they have laid to these radical changes that have taken place. They claimed that a great many faults in paraffining cheese (and there are faults) are due to trying to paraffine the cheese when wet on the surface or when it contains too much moisture.

This change in the cheese industry might be compared, to a greater or less extent, to things that have occurred in other industries. For instance, we do not have to go back very far to find when a great deal of meat was killed and cured on the farm. I came from Pennsylvania here and you may know that most all the pork, particularly, sold from Pennsylvania farms is killed on the farms. They sell the fresh meat and that is shipped to the city, the old style of doing things. But in the Western states it is gathered into the packing houses and it has even gone to such an extent that the consumer on the farm (and the farther west you go the more true is this), never makes any pretense of killing his own meat at the present time. He goes to his butcher, who in turn has bought his meat from the packing house, which may be hundreds of miles away, paying the profits of the packer and retail dealers but escaping from what he supposed to be a little hard work.

At first the process of paraffining was carried on entirely by the dealers. They found it prevented waste. It did not take the factory men very long to grasp this same idea, they believed that they too could save a little by using paraffining tanks and this has added to the faults found with paraffining, because of the fact that the factories as a rule have not been in a position to do very good work. They have naturally been driven in a good many cases to the use of hot water baths in heating paraffin. In the first days they tried direct heat, but you can understand at the present time that this is a rather dangerous proceeding. Paraffine, like most other fats, is very likely to catch on fire and the old direct heat for paraffining tanks has been done away with almost altogether. I do not

think in the last five or six years I have seen one. The only other thing for the factories was the hot water bath, while the dealers in most cases had the opportunity of using steam which gives a much higher heat in paraffining and which, as I will point out as I go along, has done away with many of the attendant evils of the process.

The faults in a paraffined cheese are few but very pronounced. These were not noticed in the early stage of the process because paraffined cheese, even at its worst, was so much better than the unparaffined people very naturally did not pay any attention to any comparatively slight faults. At the present time the dealers and everybody want as nearly a perfect cheese as they can secure, and this has very naturally turned attention to faults which in previous years appeared to be of little consequence.

Of these faults, the first is a cracked paraffine, and this you will understand at once. Where the paraffine has cracked, running all through the surface of the cheese the paraffine is likely to peel away from the surface of the cheese. Then there is rind rot, which is sometimes called moisture under the paraffine. I have heard cheese judges say "Too much moisture under the paraffine" but this is actually a rind rot, a decay of the cheese surface and deterioration of the cheese. We thought when we began paraffining we got away from the mold evil but any dealer still finds trouble with moldy cheese.

There has been very little experimental work done on paraffining, to help solve some of the problems which are presenting themselves to the cheese makers and cheese dealers. Our friend Michels did some work in Michigan some years ago. There has been a great deal done on the question of loss in cheese, but, aside from the work of Prof. Michels, the attempt to solve some of the finer points that came up has never been made. I might say there has been a growing demand for this. The dairy press has mentioned problems coming before it, the managers of cold storage houses and wholesale handlers of cheese have been interested and our department have had many inquiries in regard to troubles experienced. There has been a demand for this information and that is the reason I have been trying to do what little I could to set the thing right.

The experimental possibilities in paraffining, like the faults are not very many. There are not many changes you can

make in the process. You can paraffine cheese at different stages. In the early history of the process, cheese was paraffined even when a month old, but the tendency is to get as near the press as possible and the only question is how close can we get to the press and do a good job. Then there are different temperatures at which the paraffine is applied.

There is no established method for paraffining cheese where there is a steam coil in the paraffine vat. Where the factories are heating paraffine with the hot water bath it is almost impossible to get much above ninety degrees, and in cold weather where paraffining is done very rapidly, the paraffine would cool below that point. With the steam coil it is possible to get as high as 280 degrees and I understand the Danish dealers in cheese have been using as high as 300 degrees. I should imagine there would be some difficulty attached to that temperature because even at 260 or 280 degrees paraffine begins to smoke. I do not know the boiling point because I have never been able to get it.

Member: It is easy to prevent smoke by putting in enough water to cover the coil.

Mr. Doane: Under such conditions you do not get your temperature because if you have water in the paraffine the highest temperature you can get is the boiling point of water, 212 degrees, but you get that smoky condition with a very high heat and I imagine at 300 degrees that would be very bad. I have used as high as 275 but that is the highest I have ever been able to get the paraffine bath I have been working with and even then there was considerable smoke.

Then there is the length of time dipped in the paraffine and there is the question of the temperature of the cheese itself. I never knew until about three months ago that there was any practical condition where cheese could be taken from cold storage and dipped in a paraffine tank. I had known that one of the dealers at Plymouth had a private room in his cold storage plant there and used to run his Saturday's receipts into that room and paraffine on Monday. That would give a chance for the cheese to become very cold. I received a letter from a New Jersey plant saying they had been having considerable difficulty with mold growing under the paraffine and I recognized the difficulty because in some of my own experimental work I tried to paraffine moldy cheese after I had

wiped it off. The cheese came direct from cold storage, thirty-two degrees, and I dipped it in one of the tanks at Plymouth. A couple of weeks afterwards there was as good a growth of mold under that paraffine as you ever saw. It seemed to promote the growth rather than hinder it. So there is the temperature of the paraffine, the temperature of the cheese itself, the moisture in the cheese and the length of the time dipped.

Referring to this moisture in the cheese, just before I forget that, I want to say that a good many of the dealers have been in the habit of saying "Too much moisture in the cheese, you cannot paraffine it, injury in flavor, injury in the texture, etc., etc." In my particular experiments I did not try to work on this one problem, there was no necessity for it. I was making cheese in the factory of a man who was a pretty good business man when it comes to cheese making, and he did not make his cheese any drier than he really had to do to get full price. We had what the dealers would call a rather soft cheese, certainly not a firm cheese, it was rather soft and yet a good marketable cheese. I could take the cheese from the press, while they were still dripping with whey, and dip them in the paraffine. The paraffine bath was heated with a steam coil so I could get any desired temperature, could reduce it to 175 and get it up as high as practical with the steam coil. Then too it was close to cold storage. I did not have to allow the cheese to stand outside after they were paraffined, which has been found to be injurious to the cheese. They were paraffined in the morning and in the afternoon were loaded into a spring wagon or buggy, something that would not stir or break the paraffine, and were taken to the cold storage. They were only out in the curing room three or four hours. On the other hand, in some of my experiments I lengthened the time of keeping in the curing room. One day it rained and as I had several miles to go I did not take the cheese to the cold storage. Once we left the cheese in the curing room about a week to test the effect of that warm temperature on paraffined cheese. This was in the summer time. There were a number of lots made up, about eight or ten, and we varied the temperature from 190 degrees, which is a practiaal temperature with the hot water bath, to 275 degrees. We varied the age of the cheese fresh

from the press to a week old. I had already done a great deal of work in paraffining at two weeks old so I could make comparisons with that. We did not take one cheese from one lot and paraffine it fresh from the press and another cheese from another lot and paraffine that a week old, but we used the same lot taking eighteen or twenty cheese from the one lot. Part of these were dipped direct from the press, some of them dipped one second and some ten seconds, and others thirty seconds in the lower temperature paraffine; part of the cheese was direct from the press, part three days old and part one week old, and in that way obtained an exact comparison from one lot of cheese. Then the different lots would show whether there was any difference in the handling of cheese from day to day, could we expect the same results by the same process to-day as we could expect from a similar process in a week from now or a month from now if conditions were much the same. Of course about the only change in conditions we could get would be variation in the moisture of cheese and temperature of the cooling room. We used a temperature of 190 degrees, 220 degrees, about the temperature used in the warehouse, 240 degrees, 275 degrees. We weighed a great many cheese before they were paraffined and weighed them at the time they came out of cold storage. The result of those weights emphasized the results that had been found before in paraffining work, that is that there is very little or no loss in good cold storage on paraffined cheese and we found that cheese paraffined at three days old and above lost very little weight, but cheese paraffined from the press lost all that was gained by this early paraffining. To illustrate: We had two cheeses of the same weight when they came from the press; we paraffined one direct from the press, weighing 20½ pounds. We paraffined the other when three days old and it weighed 20 pounds. It had lost one half pound in the three days. When these two cheese came out of cold storage six months after paraffining each weighed 19½ pounds. We did not save an ounce by paraffining direct from the press. Of course if a factory manager is paraffining direct from the press and delivering his cheese two days old he would save some weight but it would leak out in the dealer's hands, so there is nothing saved ultimately by paraffining direct from the press.

There is considerable saved in paraffining at three days old as compared with paraffining a week old.

There were faults showing in the cheese paraffined at 190 degrees. If the surface of the cheese was a little cold it received such a thick coat of paraffine that it was bound to crack in any rough handling. You cannot do a good job of paraffining at 190 degrees if you dip and take it right out as most of the owners and dealers do. If you leave it in for fifteen or twenty seconds you will do a fairly good job, but you do not do as good a job when paraffining at 190 degrees as when you paraffine at a higher temperature. Then, too, there is another thing with the higher temperatures in paraffining, there seems to be a cementing of the surface, something like a postage stamp sticking to a letter, that paraffine sticks right to the surface of the cheese and it is almost impossible to peel it off, but at 190 degrees you can roll off a large part of the paraffine. It does not stick to the surface of the cheese.

In paraffining direct from the press I got a moldy cheese. I have no explanation to make for that, nothing definite. We do know that the extra whey contained in the cheese at the time it was paraffined in some way got out, evaporated of course, and very likely too, something that favored the growth of the mold went out with the whey. This settled on the surface and the mold would then grow the same as upon unparaffined cheese, and it made a bad job. It was always on the outside of the paraffine, never under the paraffine. Another thing, in paraffining cheese from the press we could not get the color to the rind for a long time. I do not understand why that is the case, I suppose it is the dried out surface that gives the color to the rind, but you do get the desired color if the cheese is allowed to stand in storage for a couple of months. If it were not for that mold growing on the surface of the cheese paraffining from the press would make the finest job you could possibly secure. It colors up fine if you give it the necessary time, and in the places the mold does not grow it is as clear and yellow as it possibly can be.

I have something else to say that a great many dealers find hard to believe. They have claimed that the rind rot I have mentioned before was due to moisture under the paraffine. I have never yet seen a case of rind rot in cheese paraffined direct from the press, and I have paraffined hundreds of them

PLATE NO. 6—SECTIONAL VIEW OF PRIZE CHEESES AT THE WISCONSIN CHEESE MAKERS' ASSOCIATION.

in my experimental work. I do not believe I ever saw a cheese paraffined at two weeks old that did not have rind rot, and I have examined a great many of them. If you examine closely you will find that rind rot, appears as white blotches all over the surface. If you push the paraffine away with your thumb you will find it is very slippery, underneath it is like a rotten apple. Rind rot disappears, as cheese is paraffined closer to the press, paraffined at three days old only a few spots show, while at a week old almost every cheese will show the white blotches.

As I said before, 190 degree paraffine bath did not work well if the cheese was dipped right in and taken out immediately, as most factory operators and cheese dealers do, but if left in the paraffine bath fifteen or twenty seconds it resulted in a good job although never as good as with a higher temperature. We found 220 degrees as efficient as a higher temperature, although if I were paraffining cheese for myself I would get the temperature as high as I could, at least to 260 degrees. My reasons for that are these,—nearly all cheese when four or five days old has started a mold growth on the surface. If the mold has reached the green stage there will be spores, which are somewhat resistent to heat, but if you paraffine at 250 degrees and allow the cheese to remain in the paraffine for a couple of seconds I do not think there will be any trouble from mold growing on the paraffine. With cheese paraffined from cold storage it may be desirable to hold the cheese in hot paraffine from five to ten seconds to kill all the mold, but it can be done in that way.

If you are going to use a hot paraffine, how are you going to keep your shelf or rest for the cheese from melting into the paraffine surface? That bothered me a great deal when I was holding cheese in the paraffine for ten seconds. There was no damage done to the cheese at all except where the cheese touched the iron bars running across the shelf, and they will melt in pretty badly. Unless you allow the rest to stay outside the paraffine a good long time between each dipping it is serious. Since then I have used wooden rests with a sharp edge. If you use a rest that was cut from a piece of wood one inch in diameter you would have one quarter inch where the cheese rested with no paraffine, and you would not want that,

so I have taken almost a knife edge for the wood. Use thin strips three eighths of an inch thick, set them close together, then use the sharp edge. The edge becomes hot and you will have no trouble at all. It is a very simple arrangement and I prefer the wooden rest to iron rests because you can use a very hot paraffine and can leave the cheese in the paraffine five or ten seconds. I would put those wooden rests one half inch apart, then if you are using one quarter inch strips that would leave one quarter inch for the paraffine to get through.

Now there is the question of allowing the cheese to remain in the factory after they are paraffined. The way the paraffining has been done at most of the factories I do not blame the dealers who object. I am in favor of anything that will go towards making a better product and because of that I have complaints from several people,—dealers, factory men and others. If the dealers do not want the factory men to paraffine the cheese and will pay the price, the factory men will not do the paraffining, but it is all right for a factory man to paraffine his cheese if he has good facilities for doing it and if not he should not do it. A great many factory men have only the hot water bath and if they use it they should know how to use it in the right way. They should not dip the cheese in and out and think they have a good job. They cannot paraffine a cheese one day old, hold it in the factory a few days and then send it to the cheese dealer and have it just right. Rind rot can be formed by allowing cheese to remain in a warm room any time after it is paraffined. If cheese is held three, four or five days after it is paraffined in a warm curing room in summer it is bound to be a poor job. I do not blame dealers objecting to that kind of cheese. But I think this question is going to change the cheese business more or less in the future. Already factories are delivering cheese twice a week and it is all right. It is better that the cheese should go into cold storage out of a hot curing room in the summer than that it should remain at the factory. It will be a better cheese when ready for the consumer than if it were in the factory three or four or five days. I believe that change is going to come despite the fact that a good many people do not want it that way. The business can be adjusted so as to take care of any disarrangement in the present method.

Now there is the question of how much paraffine to use. Well it is so very little that it amounts to almost nothing for an individual cheese. Paraffining prevents evaporation and loss of weight, but to attempt to put three or four ounces of paraffine on a cheese in an effort to bring up the weight does not work, because it is pretty hard in ordinary methods to paraffine it and get on the extra coat. If you take cheese out of cold storage and dip it in the paraffine and out again you will have a pretty good coat, but the ordinary method adds so little paraffine to the surface of the cheese that when it comes to weighing up the cheese it is almost nothing at all. My way of ascertaining that was to take eight cheeses and weigh them carefully, then reweigh those cheese after they were dipped in the paraffine. I have the figures right here.

At a temperature of 190 degrees eight Daisies were dipped one second, before dipping they weighed 169 pounds, and the eight cheeses took up just one pound of paraffine for that time; when dipped for five seconds they took up a few ounces less; in thirty seconds they took almost three quarters of a pound of paraffine. When dipped at 240 degrees for one second the cheese took nine-tenths of a pound of paraffine, and when dipped at that temperature for ten seconds one half pound was added. So you cannot add paraffine to cheese by any ordinary process and hope to profit by the weight because it does not work.

I believe that is all I have to say but I will be glad to answer any questions you may desire to ask me. I thank you.

DISCUSSION.

Mr. Kalk: Do you think paraffining cheese at three days old is better than paraffining when the cheese is a month old?

Prof. Doane: Yes it gives the best job you can get. You do not have the mold on the surface and do not have any rind rot.

Mr. Michels: I want to ask Prof. Doane in regard to three days time. Don't you think the condition of the curing room would modify the time somewhat?

Prof. Doane: That would be a pretty fine point, Mr. Michels. Of course that might make a difference of a few hours.

Mr. Michels: In my experience I have gone according to the surface dryness and I have found cheese sometimes in twenty-four hours that I could make a better job of than other cheeses where the surface would not dry for four or five days.

Prof. Doane: When you talk about paraffining cheese in twenty-four hours you always have one moist side, the side next the shelf.

Mr. Michels: I know it takes some difference in time in drying cheese in different rooms.

Prof. Doane: I do not want to be misunderstood. If one is going to paraffine at three days old and leave the cheese in the factory four or five days before delivering, it would be better to leave it without paraffining until just before you deliver it. For some reason or other paraffine does not stick to cheese in a warm temperature. It begins to peel off, gets blisters on it, and I think the blisters are usually the result of leaving it in a warm room after paraffining.

Mr. Kalk: Is it not a fact that some cheese dealers will not buy any other cheese but paraffined cheese?

Prof. Doane: Two or three years ago the dealers were objecting to factory men paraffining the cheese.

Member: Which cheese does the buyer prefer, the paraffined cheese or unparaffined cheese?

Prof. Doane: I should judge you are a cheese buyer and will ask you to answer that question.

Member: No I never did buy cheese and never made any, but I am going to make cheese. My question is in regard to American cheese. I am seeking for information.

The chairman: Prof. Doane said a few moments ago he thought it was a good idea for the factory men to ship twice a week in hot weather. Now, as a buyer, I want to say that we have not taken in paraffined cheese for two years and prefer not to. There is this objection, if the paraffined cheese comes in in good shape it is all right, but if we allow one man to paraffine his cheese we have to give the next man the same privilege, and the first man may do a good job of paraffining while the other one may do a very poor job, and in some cases the way the cheese are handled on the wagons in transit, they are bound to break and if those cheese go into storage they are bound to mold. If we can dip them into the paraffine when they come to cold storage we have a much nicer cheese than

if they are banged around on the roads. If the factory men were going to ship direct to consumers it would be a different proposition but those cheese will stay in cold storage two or three months before being shipped. This is a very important subject.

Member: Just one point I want to make of value to the cheese of Wisconsin, that is its general uniformity. If you have it paraffined by the dealers it seems to me you will have a more general uniformity in applying the paraffine than if applied by a thousand cheese makers.

Mr. Damrow: Did I understand the professor to advise shipping twice a week to the dealer, and then paraffine the cheese at the dealers'? In that case, when the cheese are three or four days old, are you liable to have the paraffine break as if it were done in the factory?

Mr. Karlen: Would you recommend paraffining a moist cheese three or four days old?

Prof. Doane: With cheese three days old you can get the best results.

Mr. Anderson: I think it is in order to have as many factory men express their opinion of the paraffining of American cheese as are here. I know of one factory man that paraffines his cheese the same day he takes it from the press. Takes his cheese from the press in the morning and paraffines it at night. I paraffine the next day after I take my cheese out of the press. They are taken out of the press in the morning, at night they are turned over and the next day they are dipped, and I have never had any complaint when they are shipped. The main thing is to have them firm so as to have a good solid body and give them time enough to have the outside dry so the paraffine will make a solid good cover for the cheese, and have the right kind of curing room. If the cheese is not paraffined in the factory before it is a week old, the factory man had better not paraffine it at all.

Mr. Damrow: Suppose you shipped twice a week from the average cooling or curing room in Wisconsin.

The chairman: The best cheese that came into our warehouse came in twice a week, paraffined on arrival and put into cold storage, and it was the finest cheese that went out of our warehouse last November, when I left. Comparing the same cheese stacked in the same room in lots of one thousand

(there were five cars), we found that cheese that we received twice a week teamed in from the factory, (it was within teaming distance), was the finest, cleanest lot of cheese we had because we had to turn out every box and brush them. Some cheese that came in developed mold. One of the nicest lots, to all appearances, we discovered, after a year's experience in 1910, was a lot we did not try to carry long in cold storage. It may have been a factory condition but I could mention the cheese maker's name and you would know that he has always been a high scorer in the contests, but we found from actual experience that that lot of cheese would mold beside every other lot that we regarded as not as fine.

I think this is a question that should be threshed out between the buyer and purchaser. I would think the way the goods suited the man I was selling to would be the right way. In the exhibit room you will find one cheese poorly paraffined, not because the man did not know how to paraffine the cheese but because he did not have the apparatus to do it. We use a temperature of 260 degrees and a steam coil but you can go beyond that temperature because I see a man in the audience who sent a sample of wax to the Standard Oil Co. and asked if there was any real value left in it and they said "no there was not," so it is possible to go beyond the smoking point. Mr. Newman had been having difficulty with a tank that did not hold up sufficiently and he put in a steam coil, but I imagine the steam coil was a little large for the capacity of the tank.

Prof. Doane: In Denmark they claim to use the paraffine at 300 degrees and over there they do not paraffine until cheese is over a month old, and I have never heard any complaints about the paraffine.

Mr. Michels: Are there not different qualities of paraffine?

Prof. Doane: There are not only different qualities but also different heating points. I think, from my experience and the little I know of chemistry, if you heat paraffine above that point you would simply drive off some of the lower boiling fats and leave the others there and have a paraffine that had a higher melting point.

Mr. Shelby: I would like to ask if any of the members have had any trouble with paraffine boiling at a temperature below 280 degrees?

Prof. Doane: You have a coil that leaks water into the paraffine. If you did not have water in there you would not have any trouble.

Prof. Ruddick: This discussion on paraffining cheese is very interesting to me. I was responsible for the adoption of that method of treating cheese in Canada in 1902, when we were running a number of large demonstration curing rooms, and we really adopted the method, as Prof. Doane said, to get over the mold difficulty. The curing rooms being new, there was a great deal of moisture and we had considerable difficulty with that. I met with a great deal of violent opposition to the method of paraffining cheese from the trade in Montreal, they simply would not have it at first. The retailers in the old country objected very seriously to the paraffining at first, said it made a mussy condition and that it added weight, which they thought they had to pay for. To-day practically all the cheeses that remain in store for any length of time in Montreal are paraffined. There is no trouble about it at all. They recognize the saving in loss of weight. Many of our cheese are held six months in storage but none of the cheese is paraffined in the factory, they are all paraffined by the dealers in Montreal.

There was one point Prof. Doane spoke of that I thought might be of some interest. He spoke of the difficulty of using iron racks for lifting the cheese in and out. I saw the difficulty in having melting of cheese and never tried to use the iron rack, but had a rack made at the beginning out of a bar of iron 1¼" by 1" with a saddle of wood put over, the wood being round and very thin. We simply had two of those a little way apart. That is the best rack for dipping cheese that I have ever seen. The piece of wood in the cross section would be 1½" deep coming to a point at the top. I found an advantage in having two bars in the bottom of the tank that would release this rack so the rack dropped clear of the cheese and all parts of the cheese were covered with wax in that way and when they were taken out you could hardly see the point where they rested on the bar.

ADDRESS.

PROF. J. A. RUDDICK, OTTAWA, CANADA.
Hon. Commissioner, Dairy and Cold Storage, Department of Agriculture.

I have not come here today with the expectation of saying anything which is entirely new to you, but rather to discuss certain developments in the manufacture of cheese, which have been more or less before the cheese makers for some years, and to give you some idea as to the progress which we have made in Canada on these points. I shall confine my remarks, mainly, to two topics, namely, "The care of Milk for Cheese Making," and "The Cool Curing of Cheese".

The advances which have been made along these two lines during the recent years have brought about a marked improvement in the quality of Canadian cheese, and I hope that it may prove to be interesting to the cheese makers of Wisconsin to hear some of the particulars as to *how* this result has been attained.

I shall begin with "The Care of Milk for Cheese Making", not because it was the first taken up, for as a matter of fact, it was the last, but for the sake of a logical arrangement.

Allow me to quote here a few paragraphs from one of my recent reports.

"The Aeration of Milk for Cheese Making".

"Twenty or thirty years ago there was no point in the whole range of discussion bearing on the manufacture of cheese which received more attention than the aeration of milk. Speakers at dairy meetings and writers on dairy topics insisted on the general adoption of the practice, and official bulletins contained similar advice. Inventors seized upon the idea, and as a result, numerous utensils designed to facilitate the aeration of milk were offered to patrons of cheese factories. They were almost forced upon them by many well meaning factory managers. As has happened in other cases, the irresponsible agent for the sale of aerators with his plausible manner and indifference to accuracy of statement, assisted very materially in spreading what must now be looked upon,

in the light of experience and investigation, as something of the nature of a popular fallacy.

"It is rather surprising when one comes to look into the question to find a complete lack of authority, based on accurate knowledge, to warrant the advocacy of the practice of aeration. We must, however, take into consideration one or two circumstances affecting the situation at that time. In the first place, the role of bacteria in the changes which take place in milk, and in the development of cheese and butter flavors, good or bad, was not so well understood twenty-five years ago as it is now. In the second place, the intelligent use of the fermentation starter was almost unknown in those days. The cheese maker found that when the milk was received at the factory "too sweet" as the result of cooling, that the time required for "ripening" was a great disadvantage. The slight cooling which aeration alone affected was in most cases sufficient to preserve the milk, but in a more advanced stage of acidity, and the process of cheese making was hastened accordingly. The cheese maker then became an advocate of aeration. The advance in the art of cheese making and improved methods of handling milk on the farm, coming with the adoption of aeration, may probably have strengthened the belief that aeration was in some way beneficial".

By degrees, however, many leaders in dairy thought began to change their views on this question.

"It was always pointed out that milk should be aerated only in a "pure" atmosphere, which is undoubtedly good advice if it could be followed literally. If such a thing was possible, the whole question of aeration might assume a different aspect from what it does, but we are compelled, in the light of the teaching of bacteriology, to look upon the word "pure" when applied to the air of a farm yard, as a merely relative term, because we know that such air is never absolutely pure; that it carries fine particles of dust at all times, even though these may not be apparent to any of the senses. It is practically impossible to find "pure" air, using the term in a bacteriological sense. Thus, the germs which set up injurious fermentations in the milk, and which produce "gas" and objectional flavors, may be carried to the milk under conditions which would seem to be good as far as the eye can tell.

"A better knowledge of these things soon began to influence opinion on the subject from a theoretical point of view. Then on the practical side, observant cheese makers have noticed that they frequently received the best milk from patrons who never aerated nor stirred it, but who cooled it when necessary to prevent it from souring. Since the proper use of the "starter" has become quite general, it is found that some of the best cheese is now made from Saturday evening's milk which is never aerated and which is brought to the factory immediately after milking, in the same way that the morning's milk is delivered."

"In addition to these practical observations, some experiments were conducted at various United States institutions, but in no case, as far as the writer is aware, were there recorded any positive results in favor of aeration of milk for cheese making. Professor Dean of the Ontario Agricultural College, carried out some experiments about 1900 and in his conclusions, he practically condemned aeration, but as his work was done with the College herd, many Canadian cheese makers felt at the time that the result might not be applicable to ordinary farm conditions. In the face of all this evidence, both circumstantial and direct, students of cheese making were bound to alter their views in relation to this question, and during recent years many cheese makers, instructors and others have been discouraging the aeration of milk. It was felt, however, that there was a lack of authoritative data on the subject and it was with the hope of supplying that lack to some extent at least, that the Dairy Division at Ottawa conducted a thorough, practical investigation of the subject. The duty of carrying out the details of this work was assigned to Mr. Geo. H. Barr, Chief of the Dairy Division, who was assisted at different times by other members of the dairy staff."

I shall not weary you with the details of the experiments. These will be found in my annual reports and I shall be glad to send these reports to any person who may ask for them. It will be sufficient to say that arrangements were made at a cheese factory in Eastern Ontario to install a complete cheese making outfit on a small scale. Further arrangements were made with two of the patrons who had 35 cows between them, to use their milk for the experiments and to have it cared for

under the immediate direction of the men in charge of the investigation.

The conditions under which the milk was produced on these two farms were very similar to what is found on the average farm in cheese making districts.

Each cow's milk was divided by pouring it into a receiver which had an outlet at each end and which was placed so that the two streams of milk were directed into separate cans or over an aerator as the nature of the experiment called for. The morning's milk when mixed with the evening's milk at the farm was divided in the same manner.

The experiments were carried on during a period of 34 days during the months of June, July and August. Without going into details, the results are presented in the following table.

Experiments on the Care of Milk.

Defects in Curds and Cheese.

	Milk aerated by dipping.	Milk run over an aerator.	Milk aerated and cooled.	Milk cooled with water in shot-gun can.	Milk cooled in tub of water.
No. Curd Tests	18	22	18	10	30
Not clean flavor	83.4%	68.2%	44 0%	10.0%	6.6%
Gassy texture	77.8	68.2"	44.0"	20.0'	6.6"
No. of Curds	9	12	10	5	15
Not clean flavor	88.9%	50.0%	40.0%	00	00
Gassy texture	77.8"	50.0"	20.0"	00	00
Cheese.					
Not clean flavor	77.8	75.0%	60.0%	20.0%	13%

During the winter of 1908-9 these results were laid before the cheese makers and patrons at many dairy meetings held throughout the country, and cheese factory patrons were advised to cool their milk, during hot weather, by placing the cans in tanks or tubs of water, and not to stir or aerate the milk in any way. Before the season was half over, cheese makers who had their patrons adopt this plan began to report a marked improvement in the quality of the milk, and hence a more uniform and better quality of cheese. One of the oldest cheese makers in Ontario, who, as he said, had been advocating the aeration of milk for 30 years, made the statement at a public meeting about two months ago, that the new plan re-

sulted in a saving of $400 at his factory during the past season. Many instances have been reported of cases where patrons were continually furnishing badly tainted and gassy milk until they adopted the plan of cooling only, when no further trouble was experienced.

The work was continued the next summer on a somewhat different plan. Instead of confining the experiments to the milk of two herds, all the milk supplied by the 40 patrons of the factory was used. The patrons were divided into two groups, each of which received special instructions for the different tests. For instance, one group was requested to cool their evening's milk without aeration, or stirring of any kind and to put the covers on the cans as soon as milking was finished, while the other group was asked to aerate the milk in the usual manner and so on. In repeating each test several times, the groups were made to change places in the test. That is to say, group No. 1 would treat the milk in the same manner as group No. 2 had previously done. Naturally, we did not get as marked a difference in results as we did in 1908 when the men who conducted the experiments handled the milk on the farms themselves. Some of the patrons in both groups failed to carry out the instructions fully and of course, this modified the results to some extent. Nevertheless, the cooled milk invariably made the best cheese. The curds in that vat were solid and close in texture and usually clean in flavor, while the others were gassy and bad flavored.

I only wish I could show you the lantern slides which we have had made from photographs of curd tests, and sections of curds from the vats, so that you could see the curds from cooled milk with close, solid textures, and other tests and curds from the same milk, but differently treated as full of holes as a piece of sponge. Some of the curds from the aerated milk were regular "floaters", while the others were practically free from gas. Half tone cuts of these curds appear in the reports already referred to.

So now we are arrived at the point where we advise all cheese factory patrons to cool their milk when weather conditions require it, with as little exposure to the air as possible; that for practical, results, aeration, dipping or stirring is more harmful than beneficial; that the milk should be covered as soon as placed in the can.

These experiments showed that if the temperature of the evening's milk, on arrival at the factory in the morning, was over 69 degrees, or if the mixed evening's and morning's milk was over 75 degrees, it would be overripe.

It was also found that when the air temperature did not go below 65 during the night, uncooled milk was overripe when when delivered at the factory in the morning.

THE COOL CURING OF CHEESE

The cool curing of cheese is the most important advance which has been made in the art of Cheddar cheese making in Canada during recent years. While your conditions on this side of the line are somewhat different from ours, I feel satisfied that the matter is of equal importance in both countries and that I am justified in taking a portion of the time at my disposal to discuss this phase of the cheese making industry.

First, allow me to make it clear as to what I mean by cool curing. Please observe that I use the term "cool curing" and not "cold curing". I make a distinction between them. You will remember that when this question was first brought prominently to the notice of the cheese makers of the United States and Canada, that some experiments which were conducted at that time seemed to point to the advisability of curing cheese at a temperature of 40 degrees or lower. That is what I would call cold curing. Cool curing on the other hand, as I understand it, means the employment of a temperature 58 or 60 degrees and it is along that line that this improvement in cheese curing is being worked out in Canada. I propose in as few words as possible to tell you why we take that view of the matter and how we are trying to put our views into effect.

In the first place, let us see what are the special characteristics of a typical high class Cheddar cheese. Such a cheese has a firm, meaty texture, neither too firm nor too meaty with a pronounced rich, nutty flavor and with an absence of strong, sharp flavors and, of course, lacking any of the heated unclean or otherwise undesirable flavors, which too many of our cheese show. We should always bear in mind that Cheddar cheese is intended to serve as a food and not as a savory like some of the other varieties.

Let me here digress for a moment to speak of a matter which has a bearing on this point. When I mention Cheddar cheese, I do not mean to include the soft, mushy kind which early takes on a condition that is frequently mistaken for maturity and which never acquires the peculiar qualities of the Cheddar—those qualities which have made it the king of food cheeses the world over. This soft cheese is not Cheddar, and it in no way resembles that variety, unless it may be because the initial stages of its manufacture are carried out on Cheddar lines. I am aware that there is a demand for this soft, pasty article, with its insipid flavor, and that by making it we are able to sell considerably more water than we do with the real Cheddar; but I question very much if it is the kind of cheese to promote a steady and increasing consumption. No cheese has ever won and continued to hold a permanent place in the daily dietary of any people unless it possesses marked qualities of flavor. The question of flavor is of infinitely greater importance than any other quality. It is said that "you may fool some of the people part of the time, but you cannot fool all the people all the time." It appears to me that the people will sooner or later realize that they are being fooled when they buy this water-logged, neutral flavored cheese for a highly nutritious article of food. Of course, I do not mean to say that the soft cheese are not nutritious. The point is, they are not as nutritious, pound for pound, as the firmer and heavier bodied cheese are. A careful personal study of the cheese trade in Great Britain, which is the greatest cheese-eating country in the world, has convinced me that we, on this continent, have lost sight of the supreme importance of flavor. Now we cannot hope to produce this high quality in flavor unless we make our cheese right, cure them under proper conditions, and then keep them for at least two or three months before we offer them to the public. "Oh!" I hear some one say, "but why should we worry about the matter when we can sell all the cheese we make when they are a few days old and at the same time dispose of a larger quantity of water than you tell us we could if we make the kind of cheese which you suggest?" My answer to that is this: Have you ever offered the people the other kind in any quantity? Have you ever tested the matter fully enough to find out what they are willing to pay for it?

I know we have not on our side of the line, except in a limited way. A few dealers have done so, and they have built up a very profitable trade at prices which pay for the cost of carrying and the other expenses involved. I know this and there is an enormous unsatisfied demand for such cheese as I have been describing. Is it not possible that this neglect of the true Cheddar flavor is some explanation of the fact that the people are turning in their tastes to Camembert, Swiss and other varieties?

Now, don't imagine that I think I am saying the last word on this question, for I have no such idea. There are, no doubt, two sides to this question, but I must submit that it is one which is worthy of your consideration.

Coming back now to the real question before us, the cool curing of cheese, I think it will be admitted that under natural conditions, we turn out the finest cheese during the months of September and possibly part of October. Why? Simply because climatic conditions give us a better curing temperature at that time of the year than what we get at other seasons. This fact along with the further fact that the finest Cheddar cheese produced in the world comes from those Scotch and English dairies where the curing temperature rarely goes higher than 65 degrees led me to believe that better results would be obtained at about 60 degrees than at some lower point.

In planning the work which was undertaken by the Canadian government to promote the cool curing of cheese, it was first proposed to carry the cheese at 55 degrees, but as our experience grew, we gradually raised the temperature to 60, which is now accepted in Canada as the best temperature for cheese curing at all seasons of the year.

In the spring of 1902, I was authorized on behalf of the Government to build 4 large central cool curing rooms at convenient centers, to which the cheese from some 40 factories could be conveniently teamed every day. These establishments were operated for five seasons, handling in all 190,087 boxes of 80-pound cheese. Two cheese from each factory's make were set aside every week for the purpose of testing the saving in shrinkage and the effect of cool curing on the quality. These two cheese were always selected from the same batch. One of each pair was kept in the cool room and the other was kept in a room where the temperature was un-

controlled. Over 3,000 pairs were tested in this way, and they were all carefully examined and compared until they were several months old.

The results of this extensive experiment, or illustration, as we prefer to call it, may be summarized as follows:

1. Cool-cured cheese are invariably better in texture and flavor than cheese from the same batch cured at ordinary summer temperatures.

2. The saving of shrinkage amounts to about 1½ per cent during the first two weeks. It varies according to the moisture in the cheese.

3. The surface of the cheese should be allowed to dry thoroughly before the cheese are placed in the cool room.

4. If the cheese are exposed to a high temperature for more than 24 hours after being taken from the press, there is a permanent injury which no subsequent cool curing or cold storage will remedy.

5. The central curing room plan adds very greatly to the cost of handling the cheese and does not show any compensating advantages, as against cool curing at the factory. The capital expenditure required to erect and equip a central curing room is about equal to the cost of improving the ordinary curing rooms of a group of factories which would be tributary to a central establishment.

There is much more that might be said on this phase of the subject, but I don't believe in long addresses and must, therefore, pass on to another point which I wish to refer to and that is the construction of a cool curing room, or the alteration of an old one to secure the necessary control of the temperature.

The first thing to do is to lay down a cement concrete floor. This provision is not absolutely essential, but it is highly economical for the following reasons. Cement is a good conductor of heat, although the contrary view is often held. The earth underneath the floor has a constant temperature of about 55 degrees, consequently the floor acts as a cooling medium down to that point. If a wooden floor is used, it cannot be laid on the ground and, therefore, it must be insulated and the cooling power of the earth is lost. In a fairly well insulated room, with a cement floor, the temperature will not rise above 65 degrees, or perhaps 70 in extreme cases. To depend on this

means of cooling is not sufficient, however, because in the first place, the temperature should never go above 60 degrees, and secondly, the air in such a room becomes so damp that the cheese are liable to mold very badly. Fully one pound of moisture will evaporate from a 70-pound cheese during the first week after it is made and this must be removed from the air of the room or trouble will result. You cannot do it by means of ventilation, because that would mean bringing in warm air, which, of course, you do not want. To overcome this difficulty, an ice chamber must be provided with provision for a circulation of air through the curing room and over the cold surface of the ice where the moisture is deposited.

The ice chamber may be placed at one end or at either side, whichever happens to be the most convenient location. It may be on the same level or a little higher than the curing room. It should have a cubic capacity of about one quarter to one third of the capacity of the curing room.

If the building is a wooden one, matched lumber, two-ply of damp proof paper and siding on the outside and two courses of lumber and paper on the inside, leaving a six-inch space to be filled with planer shavings, will give all the insulation required for the curing room. The spaces between the joists in the ceiling should also be filled with shavings. Shavings make a much more effective insulation than an empty space. The empty air space is an obsolete form of insulation.

The curing room windows should be small, placed near the ceiling and fitted with double sash.

Better insulation is required for the ice chamber to prevent the ice from wasting too rapidly. There should be one foot of shavings and it will pay to have an extra course of lumber on the inside, leaving a 1-inch air space to prevent the moisture from the ice from penetrating into the shavings, which must be kept dry at all costs. The floor must be insulated, and that can be done by laying a false floor beneath the joists, leaving a space of one foot to be filled with shavings. The floor proper should have a slope of about one inch in four feet to a gutter at one side, in order to carry off the water from the melting ice. The outlet must be trapped to prevent the passage of air. The floor and gutter must be waterproofed, and that can best be done by covering with galvanized iron.

Another and more permanent style of floor for an ice chamber is made as follows: Lay 6 inches of concrete over the area of the floor. Cover this with 8 to 10 inches of dry coal cinders, well rolled or rammed. Cover the cinders with two-ply of tar paper and finish with 2 inches of concrete. The tar paper is to prevent the wet concrete from filling the air space in the cinders.

Another specification provides for a course of hollow brick (square tile) on top of the first layer of concrete, then about 6 inches of cinders, tar paper and finishing course of concrete, etc.

The partition between the ice chamber and the curing room should be insulated as fully as the walls. There should be two openings in this partition, one at the floor of the ice chamber and the other at the ceiling, to allow for the circulation of air. These openings need not be larger than 12 by 6 inches, and they must be fitted with sliding covers for the purpose of regulating the flow of air.

In the filling of the ice chamber, it is packed full of ice, without any covering.

Nearly 200 cheese factories in Ontario and Quebec have now been equipped with cool curing rooms and the number is increasing rapidly. The cost of the improvement has varied from $400 to $800. Factory managers say the whole outlay is repaid in about two seasons.

Of course the conditions in handling our cheese are somewhat different than yours. The home trade with us is not as large as with you and everything is regulated to meet the export trade, and therefore are kept at the factory for sometime, not as long as they should be I am sorry to say. Our people have been making a mistake shipping them partly green the last two or three years but we have encouraged them to keep them in the factory the last two or three weeks and the result is that cold curing cheese are quoted separately on the market and receive a higher price. We really have two grades of cheese on that account and I think it only a matter of a few years until practically all the factories will be equipped in this way. Meanwhile we have a good many going on in the old way, curing cheese in the ordinary temperature, and it is pretty warm in some parts of the country. Last year we had the temperature up to

100 for quite a while and I know there were great losses both in the matter of quality and shrinkage of cheese.

There is one district where practically all the factories have cold curing rooms and I think it is safe to say the price of cheese has been raised readily in that district three and a half cents a pound. It formerly was looked upon as a rather poor district and now they are getting to be conspicuous, because of raising the price for the whole district, as the cheese from the district has a better reputation. Buyers are the same all the world over and if they pay one-eighth of a cent a pound more for cheese they get it. Cold curing has done a great deal to raise the whole standard of the quality of cheese in our country and these cheese are all shipped in refrigerator cars.

Prof. Doane: They go to cold storage gradually, do they not?

Prof. Ruddick: That is one point I am glad you brought up. My contention is that properly made cheese, cooled at that temperature, need never go into extremely low temperatures. We develop a better flavor at 50 or 60 degrees. I am opposed to putting cold cured cheese into cold storage on that account, it prevents the development of the high flavor. I do not mean strong flavor, I mean that typical cheese flavor. We want not only an absence of bad flavors in cheese but we want very positive quality of good flavor. I think we are too easily satisfied and call cheese good flavor when it has no flavor at all. If you keep cheese at too low a temperature that high flavor will not develop but if cheese have been exposed to high temperature for a few weeks and noticeable fermentation has come, it is possibly better to put them in cold storage. Many of our cheese are never put in cold storage, but are never allowed to get warm, are shipped in refrigerator cars, kept in cold warehouses in Montreal and shipped across the Atlantic in large compartments in the steamers, where the temperature is kept at 40 to 50 degrees.

Prof. Doane: Is there any growing demand for milder cheese in the English market?

Prof. Ruddick: Somewhat milder, but they always want that flavor that I speak of. That is true Cheddar flavor. They will never pay a high price for any cheese that has not that flavor but they want cheese with a little more meat than they used

to get, and this came about largely through improved methods of transportation and handling. If we made soft cheese ten years ago in Canada and shipped it under conditions that then prevailed, the cheese was spoiled before it reached the consumers, but now with improved facilities for handling they find they can handle these meaty cheese and have a cheese that is not bad flavored. I think there is that tendency for selecting a milder flavor. Many of the cheese consumed in the country are a year old, and even at that age those cold cured cheese have a very mild flavor, with that characteristic cheesiness which is after all the essence of flavor in cheese.

Prof. Doane: I do not like to leave that cold curing room proposition. We know the systems in the two countries are entirely different. You advise cold curing in Canada and we have gone entirely towards cold storage and are more rapidly getting cheese into cold storage than in former years. I was fortunate enough to be invited to go to Guelph to talk before your instructors, and a number of your men were present at the Guelph meeting, and during the course of my talk I compared the systems in the two countries and I want to bring out the same point here. Two of those men present at that time have scored cheese for me in my experimental work. At the same time I had two expert judges, Mr. Baer and Mr. C. White, both excellent judges of cheese. The cheese had gone into storage two weeks old and one week old respectively, and from the press. The judges from the states preferred the cheese that went in at one week old and the Canadian judges preferred that that went into storage immediately from the press because of the mildness. I asked both those judges how it happened. I had been led to believe that the English market demanded a rather highly flavored cheese, at least what we call highly flavored in this country. They both said those cheese would meet the English demand for flavor rather than the stronger cheese. On that basis I got into quite an argument for the advantages of cold storage over cold curing. I did not want to leave the question as you left it.

Prof. Ruddick: Across the water the buyer is looking for the mild flavor in cheese. Cheese are shipped from Canada before they develop the full cheese flavor. That flavor, however, develops in those mild cheese before they reach the consumer in England because it is a long time from shipment before it is put on the sales counter.

FRIDAY AFTERNOON SESSION.

The meeting was called to order promptly at 2 o'clock as per adjournment, by President McCready.

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

PROF. CARL E. LEE, MADISON, WIS.
In Charge of Wisconsin Monthly Scoring Exhibitions.

One year ago this same subject was discussed at your convention. Another year of the scoring exhibition conducted by the Department of Dairy Husbandry, College of Agriculture, University of Wisconsin has passed. We all feel that during this time every member of this association and all others interested in furthering this great industry in Wisconsin have done a great deal. The other day Mr. G. Marty gave you his views regarding the status of the foreign cheese industry. It is possible that some of the facts that he presented are equally true regarding the American cheese industry. Is it possible that some of the facts that he presented are equally true regarding the American Cheese Industry? Wisconsin with its 1900 or more cheese factories and the manufacture of nearly one and one half millions pounds of cheese must ever consider the three factors that influence quality; namely: good milk, sanitary and well equipped factories, and skillful operators. It is the operator that the scoring exhibition gets in direct touch with.

During the year that closed May, 1911, a total of 250 exhibits of Cheddar and 31 foreign cheese exhibits were received at Madison. For each month these entries were scored by U. S. Baer, A. T. Bruhn and G. Marty. To these exhibitors Mr. Marty has written a personal letter. He and Mr. Bruhn have furnished the material with reference to each month's exhibit that has been presented in the scoring exhibition articles. They have pointed out the need of better milk when it was

found that the quality of the cheese showed the lack of proper care of the milk on the farm. The value of starters in cheese making has been referred to several times. When it was warranted and clearly indicated by the entries that defects were traced directly to the makers the facts were so stated. A year ago it was pointed out why the exhibits of brick cheese contained altogether too high a water content during the fall and winter months. Mr. Marty told why this was so and outlined how it could be prevented. These defects occurred again this fall although the exhibits of cheese were not made altogether by the same men that made them one year ago.

THE WORK OF THE SCORING EXHIBITIONS.

Primarily the scoring exhibitions are conducted for the benefit of those who are laboring under adverse conditions who find it rather difficult to cope with the various factors that have a tendency to injure the flavor, texture or body of the cheese. These are the men that can be greatly benefited. It is also desirable that men who make good cheese should take part in order that this cheese may be used as illustrations of what can be done under favorable conditions.

The same plan of judging the cheese is still followed out and the score sheets of the three judges with a letter regarding the exhibit is mailed to the exhibitors. Free cultures for starter making are mailed to members of the scoring exhibitions when they so request it.

WHERE THE EXHIBITS COME FROM.

The eastern, or the Lake Shore District of Wisconsin has, during the year beginning May, 1910, and ending April, 1911, furnished to the scoring exhibitions 22 Brick and Limburger cheeses. They represented the product made in seven different counties. It has also been found that the average water content of this lot of cheese was 40.9 per cent. The highest average 42.8% being Dodge county cheese and the lowest average being Winnebago with 39.4%. The highest water content in one individual cheese was 48.3, it being a February exhibit. The lowest 32.4% in a cheese made during August.

Three counties located in the southwestern cheese district sent foreign cheese to Madison, namely, LaCrosse, LaFayette and Green. The average water content of the nine exhibits

was 40.3%; the highest 44.4% in June and the lowest 37.8% in July.

The eastern section furnished 170 exhibits of Cheddar cheese representing 14 different counties, the largest number being sent by ten different men located in Waupaca county. The variation in the water content of the cheese from this county based upon the average for each exhibitor was 37.5% and the lowest 34.4%. The highest water content in an individual score was 39.8 and the lowest 30.7%, both cheese being made by the same man. In this territory one man during the year sent 11 exhibits and 8 out of the 53 men in this section sent six or more exhibits during the year. The average water content in the 170 exhibits from this section was 34.89%.

The north central cheese district sent 11 exhibits with an average water content of 35.6 while the northwest territory furnished 28 exhibits with an average water content of 34.64. In the southwestern section 8 different counties furnished 41 exhibits, Grant county sending the largest number. The average water content in the cheese from this territory was 35.82%. Only one man made seven exhibits and they had an average water content of 34.8%, highest 37.8 in a January cheese and lowest 29.3% in an August cheese.

These figures and facts are presented to show that the men who take an interest in the scoring exhibitions are not located in one section of the state. Every cheese producing territory has been represented. The per cent of water in the cheese is presented to show that this phase of the work needs consideration by the makers. For example the average per cent of water for the 250 exhibits of Cheddar was 34.96 in a January cheese and lowest per cent 28.7 in an August cheese. One man exhibited a cheese in July that contained 36.1% water and the following month his cheese contained 7.4 per cent less water.

WHAT MEMBERS OF THE SCORING EXHIBITIONS HAVE WROUGHT.

Men who have at one time or another been members of the scoring exhibitions made the following record at contests:—

1911 Wis. State Fair:

Flats and Daisies—Second, fourth and fifth.
Young American and Long Horn—First and second.
Brick Cheese—Second.
Limburger—Second.

Minnesota State Fair—First and second.
Indiana State Fair—First and second.
Inter State Fair, Spokane, Wash.—First in American cheese.
International Dairy Show
Cheddar Cheese—First and second.
Daisy—First and tied for second.
Longhorns—First.
Young American—First.
Prints—First
Brick cheese—First.

At the National Dairy Show, Wisconsin Scoring Exhibition men won first and second in American Cheese. First in Limburger and second in brick.

The following announcement of the report of the judges on cheese was made:

AMERICAN CHEESE.

Name.	Address.	Score.
J. F. Bachman,	Fremont, Wis	91.5
Henry Metzig,	Fremont, Wis	91.5
Antone Schiller,	New Holstein, Wis	90.75
Otto Voeks,	Sturgeon Bay, Wis	91.75
Ernest Boll,	Sheboygan, Wis	95.25
Joseph Berg,	Edgar, Wis	92.75
R. P. Bauer,	Eden, Wis	91.5
R. P. Bauer,	Eden, Wis	91.75
Paul Hecker,	Osceola, Wis	94.
O. R. Scheundes,	Clintonville, Wis	96.
Freeman Hannawell,	Boaz, Wis	91.5
Chas. J. Tomashek,	Shawano, Wis	92.75
Emil Hosig,	Hortonville, Wis	91.
J. G. Aune,	New Richmond, Wis	95.25
A. C. Werth,	Appleton, Wis	95.
T. B. Tapler,	Menasha, Wis	94.
W. J. Mortensen,	Marion, Wis	96.
W. J. Cammers,	Unity, Wis	93.75
L. F. Phillips,	Viola, Wis	95.
R. W. Sterns,	Arpin, Wis	92.5
Wm. P. Sterns,	Erillion, Wis	92.75
H. A. Sterns,	Arpin, Wis	93.
Chas. Strasburg,	Loyd, Wis	92.25

PLATE NO. 5—SECTIONAL VIEW OF CHEESE EXHIBIT AT THE TWENTIETH ANNUAL MEETING OF THE WISCONSIN CHEESE MAKERS' ASSOCIATION, MILWAUKEE, WISCONSIN, JANUARY 10–12, 1912.

W. F. Preuss, Manawa, Wis..... 91.5
Aug. Brandt, Forestville, Wis..... 93.
J. J. Stocker, Dale, Wis..... 96.
H. A. Kalk, Sheboygan Falls, Wis..... 95.75
L. F. Roesler, Dale, Wis..... 94.5
Chas. Gartman, Sheboygan, Wis..... 93.5
Matheis Meyer, Stanley, Wis..... 97.5
P. W. Hien, Appleton, Wis..... 93.75
Elmer Heckman, Cleveland, Wis..... 94.25
W. J. Schlapke, Auburndale, Wis..... 94.25
Frank Burish, Cato, Wis..... 94.75
H. S. Schultz, Cato, Wis..... 95.50
Louis Rach, Greenwood, Wis..... 94.50
O. G. Rohde, Manawa, Wis..... 97.25
J. R. Biddulph, Tiskilwa, Ill..... 92.
J. R. Biddulph, Tiskilwa, Ill..... 91.75
J. R. Biddulph, Tiskilwa, Ill..... 95.75
P. H. Greiner, Little Chute, Wis..... 97.
P. H. Greiner, Kaukauna, Wis..... 95.75
Arnold Grimm, Allenville, Wis..... 95.
P. H. Casper, Welcome, Wis..... 95.
P. W. Knudson, Stitzer, Wis..... 93.
M. J. Wagner, Appleton, Wis..... 94.25
Otto Uecker, Tempe, Arizona, Box 241..... 94.75

BRICK CHEESE.

Name.	Address.	Score.
Gottlieb Kaempfer,	Darlington, Wis	92.
Wm. Nass,	Ixonia, Wis	96.
Louis Hasse,	Juneau, Wis	95.5
Casper Anderegg,	La Crosse, Wis	96.5
R. F. Gronert,	Oconomowoc, Wis	95.
John Wuetrich,	Monroe, Wis	93.
Ed. Buntrock,	Cambria, Wis	94.
Ulrich Furer,	Hollandale, Wis	94.
Christoph Franke,	Oconomowoc, Wis	94.5
Oswald Schneider,	Appleton, Wis., R. 1	95.
John Steiner,	Darlington, Wis	94.
Christ A. Schuckardt,	Kingston, Wis	95.
Anton Sutter,	Cambria, Wis	94.
Fred Moser,	Blue Mounds, Wis	93.
Geo. Schramm,	Beaver Dam, Wis	94.

SWISS CHEESE.

Name.	Address.	Score.
Peter Thoni,	Hollandale, Wis	94.5
John Emmenegger,	Gratiot, Wis	95.75
Joe Stadleman,	South Wayne, Wis	94.5
Anton Fluder,	Monroe, Wis	95.

Robert Emmenegger, South Wayne, Wis	95.
L. Gottfred, Gratiot, Wis	95.5
Fred Beer, Monroe, Wis	94.5
Fred Beer, Monroe, Wis	94.5
Fred Beer, Monroe, Wis	96.5
Herman Schoepper, Hollandale, Wis	93.5
Ulrich Furer, Hollandale, Wis	94.
Rudolf Urben, Blue Mounds, Wis	94.
B. Stadleman, South Wayne, Wis	93.5
Anton Fluder, Monroe, Wis	96.

LIMBURGER CHEESE.

Name. Address.	Score.
Ed. Buntrock, Cambria, Wis	95.
Rudolf Urben, Blue Mounds, Wis	93.5
Anton Matz, Clarno, Wis	94.
Henry Zweifel, Warren, Ill	93.5
R. F. Gronert, Oconomowoc, Wis	93.
Frank Ehinger, Mt. Horeb, Wis	97.
Fred Laengacher, Monroe, Wis	93.
Anton Sutter, Cambria, Wis	94.5
Fred Moser, Blue Mounds, Wis	96.

Mathias Meyer, Stanley, Wis., won first premium, gold medal, on American cheese.

O. G. Rohde, Manawa, Wis., won second premium, silver medal, on American cheese.

P. H. Greiner, Little Chute, Wis., won third premium, bronze medal, on American cheese.

Fred Beer, Monroe, Wis., won first premium, gold medal, on Swiss cheese.

Anton Fluder, Monroe, Wis., won second premium, silver medal, on Swiss cheese.

John Emmenegger, Gratiot, Wis., won third premium, bronze medal, on Swiss cheese.

Casper Anderegg, La Crosse, Wis., won first premium, gold medal, on brick cheese.

William Nass, Ixonia, Wis., won second premium, silver medal, on brick cheese.

Louis Hasse, Juneau, Wis., won third premium, bronze medal, on brick cheese.

Frank Ehinger, Mt. Horeb, Wis., won first premium, gold medal, on Limburger cheese.

Fred Moser, Blue Mounds, Wis., won second premium, silver medal, on Limburger cheese.

Ed. Buntrock, Cambria, Wis., won third premium, bronze medal, on Limburger cheese.

The $200.00 cash pro rata premium fund will be awarded to all entries scoring 92 points and above.

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

Respectfully submitted,

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

Judges.

P. W. GUSE, Madison, Wis.

Superintendent.