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Wisconsin Cheesemakers' Association

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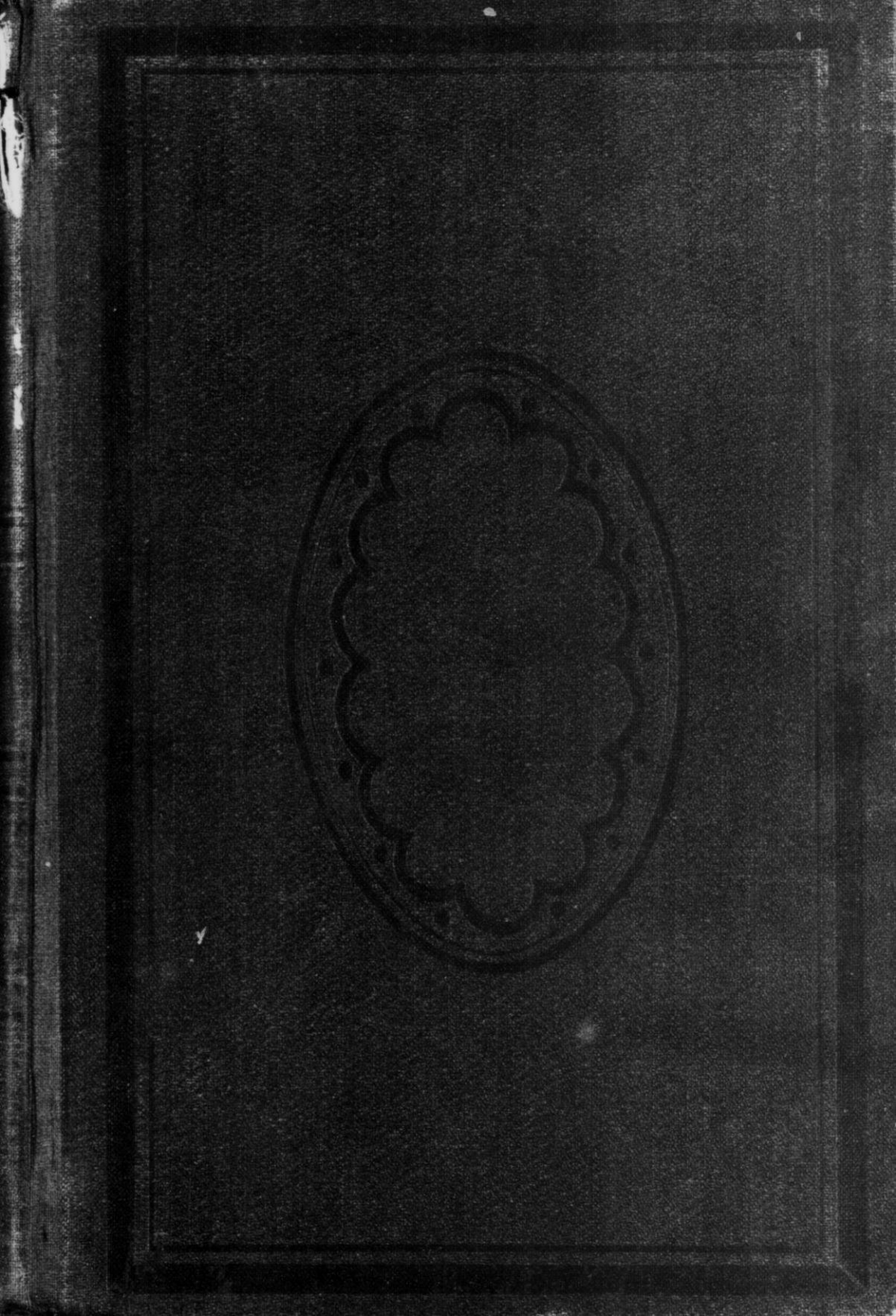
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FIFTH ANNUAL MEETING
OF THE
WISCONSIN
CHEESEMAKERS'
ASSOCIATION,

Held at Madison, Wis., February 4 and 5, 1897.

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

COMPILED BY
U. S. BAER, Secretary.



MADISON, WISCONSIN:
DEMOCRAT PRINTING COMPANY, STATE PRINTER,
1897.

OFFICERS, 1897.

<i>President,</i>	.	.	J. K. POWELL,	.	.	New Lisbon, Wis.
<i>Vice-President,</i>	.	.	JOHN CARSWELL,	.	.	Lone Rock, Wis.
<i>Secretary,</i>	.	.	U. S. BAER,	.	.	New Lisbon, Wis.
<i>Treasurer,</i>	.	.	THOMAS JOHNSON,	.	.	Boaz, Wis.

CONSTITUTION.

ARTICLE I.

Name and Object.

Section 1. This organization shall be known as the WISCONSIN CHEESE-MAKERS' ASSOCIATION.

Section 2. The object of this association is the weeding out of incompetency in the business of cheesemaking and the education of ourselves for better work in the art of making cheese, the care and management of factories, and the sale of their products. The further object of the association is to demand a thorough revision and rigid enforcement of such laws as will protect the manufacturer of honest dairy products against undue competition from deceitful and dangerous imitations; to unite the rank and file of its members in instituting a regular crusade against the unjust practice of pooling milk at cheese factories by weight, without regard to the butter-fat which it contains.

ARTICLE II.

Membership.

Any person who is a practical cheesemaker and such other persons as are directly or indirectly interested in the manufacture and sale of unadulterated cheese may become members of this association by paying one (1) dollar annually in advance.

ARTICLE III.

Officers.

Section 1. The officers of this association shall consist of a president, vice-president, a secretary, and a treasurer.

Section 2. The president, secretary and treasurer shall constitute an executive committee.

Section 3. Only actual cheesemakers and the owners of cheese factories shall be eligible to hold office and shall have a voice and vote in the election of officers.

Section 4. The term of office in this association shall be one year. An election of officers shall be held at each annual meeting. The election of officers shall be by ballot, except in case of a single nominee, when election by acclamation may be substituted. A majority of all votes cast shall decide an election.

ARTICLE IV.

Duties of Officers.

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

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

Section 3. The duties of the secretary of this association shall be to keep a complete and accurate record of the proceedings of this association and to attend all meetings, keep a correct account of the finances received, pay all moneys into the

hands of the treasurer and receive his receipt therefor, and to countersign all orders for money drawn upon the treasurer. He shall keep a record-book and suitable blanks for his office.

He shall make a full and complete report at each annual meeting of the correct state of the finances and standing of the association. He shall also procure certificates of membership and every person joining shall receive one, signed by the president and countersigned by the secretary.

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

He shall file with the secretary of the association all bonds required by the constitution. He shall make at the annual meeting a detailed statement of the finances of this association. He must keep a regular book-account, and his books shall be open for inspection at any time by any member of this association.

Section 5. The duty of the executive committee shall be to audit the accounts of the secretary and treasurer, and present a report of the same at the annual meeting; to procure a place to hold the meetings and make arrangements for reception committees, hotel rates, halls, and all necessary preliminary arrangements for each and every meeting.

Section 6. The committee on programs shall make all arrangements for the proper working of the conventions, assigning all subjects, arranging for speakers, and make the division of time allotted to the discussions of each topic, to determine upon the time for the election of officers, conducting the business meetings, and any other matters that may properly come under this division.

Section 7. The committees on resolutions shall draw up such resolutions as the exigencies of the time may require, and which shall express the sense of the association.

ARTICLE V.

Bonds.

The treasurer of this association shall give a bond in the sum of one thousand (1,000) dollars, with two sureties for the faithful performance of his duties.

ARTICLE VI.

Amendments.

Any article of this constitution may be altered or amended at any regular session of an annual meeting, provided the proposed alterations or amendments shall have been read before the society at least twenty-four hours previously, and provided also that said alteration or amendment shall receive a two-thirds vote of the members present.

BY-LAWS.

ARTICLE I.

The members of this association are heartily in favor of full cream cheese, therefore we will not, under any circumstances, receive into membership in this association any one who is in any way connected with the manufacture of filled cheese.

ARTICLE II.

Every cheese-factory represented in this association shall have the privilege of entering for competition for premiums at each meeting, either by owner or maker, one full cream cheese, unbored, properly vouched for in writing by owner, maker, and one disinterested party as fair sample of the make of that factory.

These exhibits shall be passed upon by competent judges (appointed by the president), using the score of points used at the Columbian Exposition.

The prize shall be a gold medal for the best cheese, a silver medal for the second best, and a bronze medal for all cheese scoring ninety points or above.

Makers exhibiting shall receive a diploma, signed by the judges and verified by the president and secretary, setting forth the score of his cheese, the highest score, the lowest score, and the average score of all cheese exhibited at such meeting.

ARTICLE III.

Rules of Order.

The rules contained in Roberts' Rules of Order shall govern the association in all cases in which they are applicable, and in which they are not inconsistent with the rules of order of this association.

ARTICLE IV.

Amendments.

These by-laws may be amended or repealed by a two-thirds vote of the association in the same manner as the constitution.

FIFTH ANNUAL CONVENTION

OF THE

Wisconsin Cheesemakers' Association

*Held in the Agricultural Rooms, State Capitol Building,
Madison, Wisconsin,*

Thursday and Friday, February 4 and 5, 1897.

PROGRAM.

MORNING SESSION, THURSDAY, 9:30 A. M.

Address of Welcome.....	T. J. Fleming, Madison, Wis.
Response by.....	John Carswell, Lone Rock, Wis.
President's Address.....	J. K. Powell, New Lisbon, Wis.
How to Educate the Patrons so that None but Good Milk will be.....	
Delivered.....	E. C. Spooner, Mineral Point, Wis.
Lessons We Are Learning at the Wisconsin Dairy School: From a.....	
Student's Standpoint.....	Henry VanLeeuwen, Effingham, Kan.

AFTERNOON SESSION, THURSDAY, 2 P. M.

This session will be devoted to work by the National Dairy Union.

The Trade Mark Bill.....	D. W. Wilson, Elgin, Ill., Sec'y National Dairy Union.
Treasurer's Report.....	A. C. Van Elston, Muscoda, Wis.
Secretary's report.....	J. W. Decker, Madison, Wis.

After which, discussion of needed legislation will take place.
Election of officers of the Wisconsin Auxillary of the National Dairy Union.

EVENING SESSION, THURSDAY, 7:30 P. M.

The Secretary and Treasurer's report.	
Election of Officers.	
An Address by.....	Ex-Governor W. D. Hoard, Fort Atkinson, Wis.

MORNING SESSION, FRIDAY, 9 A. M.

Curing and Boxing of Cheese.....	Adolph Schoenman, Plane, Wis.
How to Construct Curing Rooms to Maintain Equal Temperatures.....	
.....	Prof. F. H. King, Madison, Wis.
Receiving, Sampling and Testing of Milk.....	F. B. Fulmer, Madison, Wis.
Fermentation Test.....	George Winsor, Mauston, Wis.
Cheddar Cheese Making.....	Edwin Hauk, Neenah, Wis.
Question Box.	
Announcement of Score and Presentation of Medals by President.	

AFTERNOON SESSION, 2 P. M., FRIDAY.

Address by.....Dairy and Food Commissioner Adams, Madison, Wis.
 Address by.....J. H. Monrad, Winnetka, Ill.
 Address by.....C. A. White, Fond du Lac, Wis.
 Address by.....E. L. Aderhold, Neenah, Wis.

After the reading of each paper all persons present are kindly requested to ask questions and discuss thoroughly the articles read.

J. K. Powell, New Lisbon, President.
 John Carswell, Lone Rock, Vice President.
 U. S. Baer, New Lisbon, Secretary.
 Thomas Johnson, Boaz, Treasurer.

The association offers the following premiums to be competed for at the annual convention to be held at Madison:

The association offers a gold medal for the best (lot) of three cheeses, one of which to have been manufactured in June, one in August, and one in October. A silver medal for the second best, and a bronze medal for all lots whose score averages 85 points or above.

Those who have failed to save three cheeses for the regular exhibit, may exhibit a single cheese made at any time to compete for special premiums.

Persons entering three cheeses for the regular premiums will also be entitled to enter a cheese for the special premiums.

Cornish, Curtis & Green Mfg. Co., manufacturers of high-grade dairy goods, Fort Atkinson, Wis., offer to the one exhibiting the best full cream cheese one 20-bottle Curtis Babcock milk tester, value \$32.00.

The Wisconsin Dairy Supply Co., of Whitewater, Wis., offer one Harris Curd Mill for the best cheese which has used Hansen's Rennet Extract in its manufacture. Value, \$15.00.

 CHEESE EXHIBIT.

RULES.

1. Every exhibitor must be a member of the Association. One dollar secures a membership and the annual report.
2. Cheese made at any time in flat or cheddar shapes, full cream, unboiled, properly vouched for in writing by the owner, maker, and one disinterested party.
3. Scale of points for judging cheese:
 - Flavor, 45 points.
 - Texture, 30 points.
 - Color, 15 points.
 - Make up, 10 points.
4. No package can compete for more than one premium. Entry blanks will be furnished by the secretary.
5. The tag upon the box shall contain the name and address of the exhibitor, a duplicate of which shall be pinned on the cheese inside the box.
6. Cheese must be shipped by express, charges must be prepaid, with name and address of each package, to the secretary.
7. Manufacturers, dealers, and inventors of dairy goods, are invited to make an exhibit. No award or premium will be given.

TRANSACTIONS,

WITH ACCOMPANYING PAPERS AND DISCUSSIONS OF THE

Wisconsin Cheesemakers' Association

AT THEIR FIFTH ANNUAL MEETING,

Held at Madison, Dane County, Wis., February 4 and 5, 1897.

The fifth annual convention of the Wisconsin Cheesemakers' Association was called to order by President Powell at 9:30 a. m. in the Agricultural rooms at Madison, Wisconsin, February 4, 1897.

The following committees were appointed by the president:

On Resolutions,—

A. C. Van Elston, Muscoda, Wis.

J. A. Carswell, Lone Rock, Wis.

A. Schoenman, Plane, Wis.

On Cheese Exhibit,—

W. C. Dixon, Madison, Wis.

MR. T. J. FLEMING, of Madison, secretary of the Wisconsin State Agricultural Society, was introduced to the convention and made the following address of welcome:

Mr. President, Gentlemen of the Cheesemakers' Convention: I never like to apologize, but it is only justice to you, as well as to myself, to state that it is not over two minutes ago, at the very farthest, that I was aware of being called upon to perform this pleasing duty. I am to say to you, gentlemen, that you are welcome, in convention assembled, at this time, in Madison, which I assure you I heartily and most urgently say. And permit me at this time to say that if there is any one body of men in Wisconsin, more than another, to whom I take pleasure in extending a glad hand and welcome, it is the Cheesemakers' of Wisconsin. Why? Because many of the best years of my life, up to the present, have been spent in that work. As many of you know, I have been actively engaged in cheesemaking for not less than ten years, and I am pleased to say that I made a little money at it, and I believe, had I continued, I would have made more. I believe it is an industry that has surpassed the expectations of the most sanguine in Wisconsin. It is an industry that ought to receive the fostering hand of the State, if there is any in the State that ought to be so fostered. Why? I have said in the past that in traveling through any part of the State, where heretofore I had not visited, I could tell, by the very atmosphere, by the surroundings, the buildings, the general condition of the farms, that I was coming into a dairy district—if not cheese, then butter, and they go hand in hand. I believe that it has done more to bring the farmers of Wisconsin to the prominent position that they now occupy than any other industry we have; and I believe that an organization of this sort, attended as I see it by so many of the coming young men of our state, simply tends to more perfect this organization. You have, indeed, a great task to perform, because you are manufacturers. You take the raw

material, you convert it into a manufactured and compact article, you have to put skill and intelligence into that work, if you are going to attain the best results, and any line of work or industry that requires that skill and brain-power, can best be developed by your coming together in conventions of this sort and exchanging your ideas.

Now, I know as well as you, my young friends, that there are two important parts to be performed in the manufacture or production of good cheese. You have a mechanical part to perform, but it is a mechanism into which you have to inject a great deal of skill, and you cannot perform this work well alone. You have to go back to the origin, which is the production of milk, and I believe that every young man who starts out in this state to run, or attempt to operate a cheese factory, ought to have gathered together some thoughts, hints, or suggestions upon the care of milk. That should be made a qualification, as well as his ability to manipulate the milk when it goes into the vat, and that this should be preached into every milk producer throughout this state. I know—at least it used to be so—that there was as much harm done to the quality of the cheese product of this state by the handling and production of the milk before it got to the factory, as after it reached there.

Now, I have no desire at this time, my friends, to enter into a discussion of any of these points, as I know that they will come up during this convention (and I am going to make an effort to be here), but once more will I say that I am very sorry that the president unexpectedly did not inform me until this very moment that I was to appear before you, and I feel that I ought to apologize, because I recognize the intelligence of you men, and it seems silly to stand up here and talk, and say nothing. But I am going to atone for this as much as in my power, and I have said to your officer that if he would present to me a report of the working of this convention when you have adjourned, that I would file it and place it in our annual agricultural report, and thereby disseminate the valuable work that you will perform to the very people whom you want to reach; namely, the farmers. Tomorrow I will be pleased to see you all in our agricultural rooms. I am glad to meet you, gentlemen, and I thank you for your attention.

The PRESIDENT.—Gentlemen, if I had thought that Mr. Fleming needed my apologies, I should have made one for him before he commenced speaking, but I knew well enough that he could talk any time; but I had forgotten to even notify him that he was on the program till Mr. Carswell went out after him. It did not make any difference,—

Q. Didn't you send Mr. Fleming a program?

PRESIDENT.—If we did not, it was the secretary's fault, not mine.

RESPONSE BY MR. JOHN CARSWELL, OF LONE ROCK.

Mr. President, Gentlemen, Mr. Fleming: It seems to have devolved upon me, through some inexplicable reason, to say a few words in behalf of this association, thanking the gentleman for the cheering words with which he extends to us the cordial welcome of this city on this, the commencement of the Fifth Annual Meeting of the Wisconsin Cheesemakers' Association. While we fully appreciate the honor he does us, and each good word spoken will help to cheer and lighten the long hot hours we shall spend over the vat and in the curing room next summer, I would also say to him, in the line of his own remarks, that we, as cheesemakers and factory-men, take a just and honest pride in our profession and work, that is bringing more profit to those engaged in it than any other branch of farming industry in the state to-day. I do not mean to tell you that we are piling up wealth so fast that the tax-collector cannot keep up with it, or that a membership in a cheese factory or ownership in a dairy is a scot-free through pass to salvation or wealth, with palace-car-accommodations, but I tell you, gentlemen, what it is. It is a right smart chance for a fellow to work his passage. It is a sort of tie-pass around the poor house, and in these days of general depression—with wheat or corn, oats and pork not paying the cost of production—and, as I say, in these days of general depression, anything that has got

a dollar in it is a God-send to the farmers. And all over the country you hear this same thing, this same story, from the farmers: "Our dairies are about the only things that are bringing us any money." I tell you it is a fact that the dairy industry, the cheese factories or the factories in dairies, of this State, are keeping the roofs over the heads and furnishing sustenance with a goodly number of Wisconsin's most prosperous farmers today. And we are here as cheesemakers and factory-men to help, befriend, and sustain one another to perfect unity of action and strength, and to hold together our Union—a Union which is unique in its way, comprising both labor and capital, employer and employed, under one organization, avoiding the jars and discords that arise where the two are arrayed in antagonism. We are also here for the greatest purpose of all—to keep in touch with the latest, the best, and most scientific methods of handling this cheese product through all its intricate changes, from the cow to the consumer, and we have this one purpose in view, of keeping the good old state of Wisconsin in the front ranks as a cheese-producing state of the Union, the excellence of whose products shall be equalled by few and excelled by none, if we believe that by so doing we bring plenty to the homes and happiness to her people. Gentlemen, I yield the floor.

MR. FAVILLE was next called upon by the president to make a few remarks. He spoke as follows:

Gentlemen, I haven't anything special to say to the boys this morning, only to go ahead. Wade in and turn out a good product, and a tiptop business will follow, as I know from personal contact with the business from my earliest recollections almost until the present time. I am one of the oldest dairymen of Wisconsin, not only in years, but take precedence in the commencement of the business. I believe that I built the first co-operative cheese factory that was built in Wisconsin, and have taken great interest in the business from that time till now. If there is any part of my farmer life that I look back to with satisfaction, and perhaps I might say with pardonable pride, it is that I contributed my might in starting this dairy industry in Wisconsin. I started it at a time, invested money in the business, when my friends thought I ought to have put it in gardening. It costs more now to start a factory. The appliances cost twice or three times as much. I invested \$2,500 before I could start to make cheese, and my friends thought it was a foolish outlay, and that I was never going to get my money back. Well, if I did not get my money back, some of the rest have. It has grown to be a most important industry in the state, bringing more money into the state for the amount expended, and it is the most reliable business that I have ever known in all the years that I spent, and you could any of you see by my gray hairs that I spent a good many. And the dairy industry is the most reliable of any agricultural industry that I know. Indeed, I may truly say that it almost never fails, and never does fail entirely, like some of these other industries. We could never get the market filled with butter and cheese so as to last more than a season, and perhaps only a part of it. It is a perishable article and will be cleared up, and the market will be open for a new supply always. And there is another advantage which the dairy industry has over any other agricultural industry. We have the whole year in which to make our crop. With all grain-raising, you know, a few unfavorable days of an unkindly frost will ruin other agricultural prospects, but it won't do that to the dairy and cheese industry. The first part of the season may be unfavorable and the next part of it be very much better. It is almost sure to be, because if the first part of the season is unfavorable and the crop small, the demand will increase and the next end of the season will so improve that we will command better prices, and in the end the dairyman comes out and is able to pay his store bills. Now, I was last summer and fall through these very depressing times which all know, I was out through the dairy sections of Jefferson county. There is a great deal more dairying there than in Dane county, and I was among the tradesmen, the merchants, and asked them how they were getting along. The first replied: "We are not feeling hard times so much. Our dairymen get their money every month, and they come and buy their supplies, and have got something to buy with." And you will find that the universal testimony everywhere.

I am glad to see a lot of these bright faces of the young men that are learning to carry on this business, and I only say to you: "Be very thorough." I want to endorse what Brother Fleming has said about handling the milk. Learn to do

your work well from the commencement, from start to finish. Well, these subjects will be discussed here, and perhaps if I should be in I will have something to say about the question of curing the cheese, and the various stages of its manufacture. They are all very important, and are to be discussed before you, and I hope to be here and have my say somewhat. I only wish you a very profitable convention.

MR. ADAMS was next called on by the president, and spoke as follows:

Mr. President, Gentlemen: It is not very easy to get out of this scrape. I was told about ten or fifteen minutes ago that Mr. Fleming would not appear, and I must respond to an address of welcome. I came down here and saw Uncle Stephen and arranged that he should be called on, and when Tom came I thought I had a sure thing to get out of it. But after all, I am not very anxious to get out of it, and while I don't propose to take up all your time, I am certainly glad to say to you that I am glad to see you and that the people of Madison are glad to see you. I think the members of the legislature from whose districts you come are glad to see here a body of men who do business. I think the governor will be glad to see a hundred men come down here who are not looking for office. I don't think the boarding-house keepers and hotel-keepers are sorry to see you. The people of Madison generally are not as cold-hearted as they are represented sometimes. They are glad to see a body of men who represent a great material industry, and represent it as well as the cheesemakers of Wisconsin represent their industry. This is a big business. It is not the only business in Wisconsin. It is not the only profitable business in Wisconsin, but it is a profitable business, and a business which you men here can make very much better than it has been in the past. You have one purpose in coming here, and that is to make better cheesemakers in order that we may have better cheese, in order that you may make more money, in order that Wisconsin may be more prosperous. Now, I expect you will carry out that work. If there is anything I like to see, it is to see a body of men engaged in the same business organizing themselves in an association, with a definite purpose; keeping out of that association every personal controversy and personal pride and personal enmity, and working together for the benefit of the business which they represent. There is no association in my life which has been dearer to me or more profitable to me than my connection with the State Dairymen's Association of Wisconsin. For fifteen years there has been a body of men which has worked steadily for the uplifting of this state and its dairy life, and during all those years there has been maintained among the men who belong to that association the closest and the warmest feelings of friendship. It is quite a joy to all of us, gives a satisfaction in our business, and made life brighter to every one of us and brought greater profit to our state. Now, the cheesemakers of Wisconsin have something to look forward to. We have seen the last of filled cheese. We do not manufacture much of anything except full cream cheese. The one thing left for us to do, and the one thing which you can do, is to make Wisconsin cheese as good or better than any cheese made upon the round globe. It is our climate, it is in our soil, it is in our machinery, it is in our cows, it is in our milk, it is in our cheesemakers to do that thing, and I hope that you will do it, and that this association will help you do it. Gentlemen, I am glad to say to all of you: "May God speed you in your work."

MR. J. K. POWELL, president, then spoke as follows:

I suppose, as a matter of custom, they have the president down for an address, but all those of you who attended these conventions before know that I cannot make a speech. Never could. But, as a matter of courtesy, they have put me down for one. All I would say is that we are here to work, as Mr. Adams says, to see if we can not better our condition, and there is lots of room for improvement. I traveled over a good deal of the state of Wisconsin, visited a great many factories last year, and I believe I am safe in saying (and I hate to say it) that one-half the cheese manufactured in the state of Wisconsin last year would not bring the top market price. At least one-half of it. That is my observation, and

who is to blame for it? That is what we want to find out. I want you to find it out here in this convention, if you can. There is something wrong somewhere.

As Mr. Adams says, I believe that we can make as fine a cheese in Wisconsin—and I have seen them—as any part of the globe, and I don't know of any one place but what they can make fine cheese. There is no locality but what they could make fine cheese if handled right from start to finish. There is one thing that I am very sorry for—that those factory-men where I find the poorest cheese we never see in the convention. I wish we could get them here. I think it would help. We are here, today and tomorrow, to work. I want everyone to take hold and ask questions. Help one another. It is something that we do not need to be afraid to give away. If you know anything tell it, and help your neighbor. It helps you. The higher we can grade our cheese, the more we will get for our product. Let us work together and see what we can do. You will hear from me every few minutes from now on until tomorrow night.

LESSONS WE ARE LEARNING AT THE WISCONSIN STATE DAIRY SCHOOL FROM A STUDENT'S STANDPOINT.

Henry Van Leeuwen, Effingham, Kansas.

The Wisconsin State Dairy School, or Hiram Smith Hall, as it has been named in honor of Hiram Smith, is located in the western part of the university grounds. The building was erected in the year 1891, and, with equipment, cost \$40,000. The equipment in the various departments is complete, and so arranged as to give to all students practical work every day. On the first floor of the main building will be found the cheese-room, creamery and pasteurizing room, while the boiler and engine occupies a room on the north side of the main building. A stairway and elevator leads to the second and third floors. On the second floor we find the office, students' locker-room, cheese curing room, press room, and a room devoted to the farm dairy department, while on the third floor we have the lecture room, laboratory, and a students' reading room.

Prof. W. A. Henry is dean of the agricultural department, and he takes great interest in the school, and in having it so conducted as to be of the most practical benefit to its students. Prof. E. H. Farrington has the entire management of the Dairy School. He takes a deep interest in each of the students. He knows each of us, knows what experience we have had, and just what instructions we need to best fit us to make a success of our business after we have completed our course here.

In practical work we have instruction in the cheese-room, creamery and laboratory. There is also a course of lectures on practical subjects of interest to cheese factory and creamery operators and their patrons. In the latter half of the term there is a course of practical work in the pasteurizing room, also experimental and advanced work in the cheese-room, creamery and laboratory.

I have tried to give you a brief description of the building to show you that ample arrangements have been made to give the students a good practical education in the management of creameries and cheese factories. It is not only the object of the school to teach the students to manufacture a better article of cheese and butter, but also to aid them in educating their patrons in the care, management and feeding of the dairy cow. The importance of this course to the state, the farmers, and to the factory operators is very readily seen. The United States produces a very large amount of grain and feeds of various kinds. The farmer, to keep up the fertility of his soil, must feed these on the farm. These feeds, if fed to good dairy cows, will yield him better returns than if sold to the grain-dealer, providing he is a patron of a cheese factory or creamery that is manufacturing a first-class article of goods that will be classed as such on the home or foreign markets. If the farmers are in a good financial condition, the state is also, and to manufacture such goods we must thoroughly understand our business.

Upon entering the school, the class, which numbers 102, was divided into three

sections, first, second, and third, and we were assigned work in the laboratory, cheese-room and creamery respectively, changing places daily.

In the cheese-room, under the management of Mr. J. W. Decker, the first thing we were taught was the rennet test. This is of great importance to cheesemakers, as by its use we can determine the acidity of the milk and know just when to set the vat to have the acid develop on our curd at the proper time. At first we did not get very accurate results, but Mr. Baer and Mr. Berg, the instructors in this department, were patient with us, and in a very few days we learned to use the test with very good results. We then carried on a number of experiments with the test. In our class it was found that a large number of the cheesemakers did not use the rennet test, but I venture to say that we will be without it no longer. There are eight vats in the cheese-room, and four students are assigned to each vat. Each student has a part of the work to perform, and he receives a blank on which he makes a complete record of his work. These blanks are handed to Mr. Baer by the foreman of each vat, and he can at any time tell just what a student is doing, and if by his records he shows that he does not understand some part of the work, he will be assisted by the instructor. The same part of the work is never assigned two days in succession.

We have made some cheese by the sweet curd granular process, but most of our instruction has been on the cheddar system. Our instructors are certainly well qualified to teach this system, and I am sure we have learned many valuable lessons that we will bring into daily use hereafter.

A complete record is kept of each cheese made. Some of the points recorded are amount of color, rennet, and salt used, rennet test, titration, and time when set, time and titration of whey when curd was cut; titration, time and acid on curd when milled, acid and time salted and put to press, fat in milk, fat in whey, fat in cheese, and yield of cheese, also any peculiarities of milk or curd are noted.

You can readily see the importance of these records, for we can compare the different makes and profit by the results. We have learned many valuable and practical lessons in the cheese-room; lessons which, if we will practice them in our every day work, will certainly be of great benefit to us. In the creamery Mr. Bullard and Bush have charge of the six separators that are found on the east side of this room. As in the cheese-room, each are here assigned different places from day to day, so we may have a chance to learn to operate the different separators. Under the instructors in this department we have learned many important lessons in the care of the separators. A daily record is kept of the amount of milk separated per hour by each machine, the speed, the temperature of milk, skim-milk, and cream. A great benefit is derived from a careful study of these records. The various conditions affecting the skimming qualities of the different machines are noted. There is no question but that a great deal of butter fat is lost annually in the United States through carelessness in the management of the separators. By the observations we have made we have noted the effect on the skim-milk test of very slight variations in speed of machines, temperature, and condition of milk.

On the west side of the room, Mr. Wells has charge of the cream ripening, churning and butter making. Two cream vats, two box churns, one combined churn, one Manson's butter worker, one printing table and butter prints are found on this side.

We are assigned work in the care of the cream, ripening and cooling, and noting the acidity by the titration test during the process, the churning in the different churns and the washing and salting, working and printing of the butter. In this department daily records are kept of amounts of cream churned, acidity of cream, temperature of cream, temperature of butter when worked, amount of salt and color used, yield and any unusual condition of cream or butter.

The proper ripening of cream plays an important part in the manufacture of a first class article of butter. We have had a chance to observe the effect of the ripening process under different conditions, and benefited by the same.

In the laboratory, under the efficient instruction of Mr. Fulmer, we made rapid progress. He gave us a short lecture each morning on the work we were to take up that day. We were taught the use of the Babcock test, the correct method of taking samples, the correct way of adding acid, and correct reading. In fact,

every detail was so minutely described that we had no trouble in using any of the nine testers found in the laboratory.

We then took up the titration test by using the tenth normal alkali solution to neutralize the acid in the milk, cream or whey. We found this very interesting, and of great importance to cheese-factory and creamery operators. We also learned to prepare and use the Farrington tablets in making the titration test. I think we will all use the tablets solution to detect over-ripe milk at the weigh can. We may know a mess of milk is over-ripe and tell our patron so, but if we can by a reliable test prove the fact to him, he will be better satisfied. It will also be found beneficial in determining the acidity of our cream. By using this test in our cream in the course of ripening, we can tell just how to ripen to have the proper amount of acid in the morning to churn. Milk should not contain over two per cent. of acid when received at the weigh can, for butter or cheese. A 30 per cent. to 40 per cent. cream should show about .55 per cent. to .6 per cent. acid when ready to churn.

We next studied the use of the lactometer in determining the solids not fat, total solids, and adulteration of milk. Records of our work in the laboratory are kept, and any unusual tests noted carefully.

In the pasteurizing room, which is in charge of Mr. Smith, we are taught how to pasteurize milk and cream. In pasteurizing we must have very clean, sweet milk, and all operations must be thorough and complete. Cleanliness here, as in all the other departments of the school, is the watch-word, and certainly this is very important in the successful operation of a creamery or cheese-factory. Too much can not be said on this subject. It should be the watch-word of every creamery and cheese-factory operator, as our success in a great measure depends upon this. The practical work is certainly very important and the management have done their part in trying to make us successful operators. We must now practice in our daily work the lessons taught us, to gain anything from the valuable course of instructions we have received.

We have in connection with the practical work what I consider of fully as much importance: the lecture course. Two lectures of one hour each daily. The lecture-course was opened by Prof. W. A. Henry on feeds and feeding. I learned many valuable lessons from the course, and I think I can go home and talk intelligently to my patrons about feeds, the value of different feeds, how to grow them, and the proper amounts to feed. If we can talk to our patrons on subjects of interest to them, and in any way aid them in making a success of their business, we have accomplished a great deal.

Mr. J. W. Decker gave us a course on cheese making, bringing out all the details of the process, from the receiving of the milk at the weigh can to the marketing of the cheese.

Prof. Richter gave us a course of lectures on the care of the engine and boiler. This was a valuable course, as the majority of cheese-factory and creamery operators have never had a practical course in engineering.

Dr. Law gave us eight lectures on the common diseases of the dairy cow, and Prof. Craig gave us eight lectures on breeds and breeding. These also should interest us, as they are of interest to our patrons, and whatever is of interest to our patrons should interest us.

Prof. Farrington gave us an instructive course of lectures on creamery management. In this course we have received many valuable suggestions in the management of the creamery.

The next course of lectures was on heating and ventilation, and other physical problems relating to the cheese-factory and creamery, by Prof. King. This course was very practical, and of great importance to the man who is desirous of obtaining the very best results. We have sixteen lectures on Dairy Bacteriology by Dr. Russell. At first hearing this subject announced, the ordinary cheese-factory or creamery operator might say that is well enough in theory, but we cannot talk to our patrons on the subject of bacteriology. True, we cannot, nor do we intend to teach our patrons bacteriology as a professor would teach it in the laboratory or class-room, but we have learned many interesting, important, and practical lessons on the subject,—lessons that we can teach our patrons and interest them.

I think I can return to my factory and better educate my patrons in cleanl-

ness in all the departments of the dairy. I can give them good reasons why a certain system is injurious to the milk and another beneficial.

The last course of twenty lectures is by Dr. Babcock on the composition and elaboration of milk. It is unnecessary for me to say that this course was inter-careful study as Dr. Babcock is sure to be able to teach many practical lessons,esting, instructive, and beneficial. A man that has given the subject so much and practical lessons are what we need to make a success of our business. By understanding the composition and elaboration of milk we are better able to understand the different conditions and changes that occur in milk, and, understanding these, be better able to manufacture a first-class article of butter and cheese.

In connection with the school we have a dairy society that meets one evening each week. Subjects relating to our business are the topics for debate. In these meetings we have a chance to become better acquainted and exchange ideas on the different subjects.

In conclusion I will say that I think the Wisconsin State Dairy School is of great benefit to the state, and certainly to all interested in the manufacture of a first-class article of butter and cheese who will avail themselves of the opportunity of advancement and improvement here afforded. To the young men present who are learning to manufacture cheese, I will say: "Attend the Dairy School next winter." I have endeavored to give you an idea of the lessons to be learned at the school, but to thoroughly appreciate and understand the practical benefit to be derived from the course you must attend yourselves. There is a great work before the school, and it should have the support that it so richly deserves.

As a closing remark I would urge upon all present the importance of advancing the dairy business in every manner possible.

MR. FAVILLE.—I don't want to ask any questions. I have listened to the paper with a great deal of interest, and while I was doing so I got the "swell" so that it almost started the buttons off my vest. This institution is a very, very important one for this industry, and it was mainly through the influence and efforts of that old Dairymen's Association that Brother Adams told us about that this thing was started, and I was in it when it started, and it kind of made me feel good. That was all I wanted to say. Now go in, boys, and ask him all the questions you can.

MR. ADERHOLD.—I would like to ask the gentleman if he intends to make cheese in Kansas.

MR. VAN LEEUWEN.—I think I shall. I have been making cheese for 10 years, and thinking I could improve, I came to the Dairy School. I expect to make some changes and improvements when I return home.

MR. ADERHOLD.—What are the prospects for the cheese industry in Kansas?

MR. VAN LEEUWEN.—We might say in its infancy. The first factory that did any amount of business was the factory that I learned cheese-making in, and that was located in Nortonville, Jefferson county. I commenced there nine years ago under Mr. Merry. He made cheese in this state just before he came to Kansas, and I went there the first season that the factory started and worked with him for four years. I then learned butter making in Colorado, and now I am located in Nortonville, Kan., where I am making cheese. I make both butter and cheese—part of the time cheese, and part of the time butter. Part of the cheese I sell to the local trade, and what I can't sell to the local trade, in the wholesale houses of Atchison, Leavenworth, and Kansas City. I had no trouble after I got started. I took hold of a "fall" (the Davidson, Rankin Creamery), that had failed four times. The next to the last time it was run, the man went fishing one night and has never been seen since. They made very poor cheese. When I said I had Eflingham cheese,—why, that settled the question; it was not wanted. But after I got started I had no trouble in finding a good market for my goods. I closed up the Monday before school opened here and I was at that time selling my cheese to wholesale houses of Atchison for 9½ cents for flats, and 10 cents for Young America delivered. It cost me about 11 cents a hundred for delivering those goods, so that they brought me as good a price, or a little better than what I could have got if I had made cheese in this state and shipped to the Chicago market. I would say that we can make good cheese in Kansas if we thoroughly understand our business. I was making by the granular process at the time, but

I did make in the old method of leaving the curd stand in the whey, and practically developed my acid in the same way that you do with the cheddar.

Q. I would like to ask the gentleman if they haven't had some trouble with the milk there?

MR. VAN LEEUWEN.—Yes, sir, we have that trouble to some extent. I guess we have warmer weather, and we have more trouble in getting a first-class article of milk than they would in this state. We do get milk right along that gives a good article of cheese, if it is properly handled. Of course we have the rag-weed, too. What we have to do is to educate our patrons up to bringing us in a clean, sweet, pure milk. Of course, in starting up those places there are a great many factories started that do not try to get a first-class article of milk. Many of them say: "We cannot be too rigid with our patrons, or we will get them a little bit huffy. We will have to take the milk, even if it is a little bad, and do the best we can." If you say Kansas cheese, that just condemns it, and I know when we first started making there at Nortonville, when I came into the factory at first, to get the cheese introduced we had to ship them to the wholesale houses in Atchison and tell them to take the cheese, ship them out, and get what they could out of them for us, and if any of them were condemned, or there was any complaint, have them come back, and after the first couple of years we got a trade out there, and now the salesman does not need to go out of the factory at all to dispose of any goods. Orders come in for all the goods we have. Of course, we have some off-flavored, bad goods during the worst parts of the year. We don't have such severe winters. The factory at Nortonville has run every day since it started nine years ago. The factory I started was a total failure when I went there. Business slowed up lately. It was my best opportunity to get to the Dairy School, and I closed down the Monday before the school opened and started for the school here. I expect to open up about the 1st or 15th of March again. I am going to try to work the business into a winter business, because I believe that we can make it pay our patrons more money if they have their cows come in in September, and then let them produce the bulk of their milk in winter. Goods are higher then, and we can make the goods for about the same money. Of course it will cost a little more for heating, but we can produce heat easier than we can produce cold air to keep the room cooled in the summer time. Of course, our curing rooms are not perfection, by any means.

MR. SPOONER.—How many pounds of milk do you take to make a pound of cheese in Kansas?

MR. VAN LEEUWEN.—I don't know that I can give you the exact figures, but it ranges in the winter from $8\frac{1}{2}$ to 11 pounds of milk, if I remember right. I know I made out a yearly report for the Nortonville factory a couple of years ago, and I think that it ranged, for the different months, from $8\frac{1}{2}$ to 11 pounds of milk.

Q. You made rather a soft cheese?

MR. VAN LEEUWEN.—Yes, sir. We made a cheese for home consumption. We would make a firm cheese for shipping. I think all the cheese that I have ever made in Kansas has been sold right in the state, or right across the line, in Kansas City, Mo.

Q. Did you develop any acid in the whey?

MR. VAN LEEUWEN.—When I first started in we developed all of our acid in whey. Now we have changed that method, and we develop about $\frac{1}{8}$ inch of acid in the whey, and then draw our whey. We do not develop the amount of acid that they do for a firm cheese. Of course, afterwards we draw it, and salt and put it to press in an hour or hour and a half.

MR. SPOONER.—How much salt do you use?

MR. VAN LEEUWEN.—I use from $2\frac{1}{4}$ to $2\frac{1}{2}$ pounds.

MR. ADERHOLD.—At what temperature would you keep a curing room in summer?

MR. VAN LEEUWEN.—We keep it where we can. I have seen the curing room up to a temperature of 80, and I think 90. That is rather a high temperature, but as I say, we had not the curing room arranged as it should be, and the temperature would run up as high as 80 or 90 degrees. Our cheese were made rather soft, and we have shipped out cheese in eight days after they were made. That was new, I know, but our trade demanded that cheese.

MR. ADERHOLD.—Those soft cheeses and the hot curing room, wouldn't that make the faces sink down some?

MR. VAN LEEUWEN.—No, sir. We would not keep them in long enough to have the faces sink down. I think that we have to make what our trade demands, and our trade demanded that cheese, and they would kick if we would make a firm cheese, and ship that cheese in at thirty days. They would kick on that kind of cheese, if we did not send them a soft cheese. It did not make any difference how soft it was; so long as it was real fresh and sweet, they would make no complaint. A very soft cheese would cure up at that temperature so that it did not break down, and it gave satisfaction.

MR. SPOONER.—Wouldn't that cheese get strong very quick?

MR. VAN LEEUWEN.—Yes, sir. If it was eaten, however, it did not make any difference.

MR. SPOONER.—I don't see how you made cheese fit for market and developed the whey in acid.

MR. VAN LEEUWEN.—I would not say they were ready for consumption, nor would any cheesemaker; but they demanded that kind of cheese, and we made it and let them have it. They were shipped 17 miles to a wholesale house. Of course they were sold out and shipped out in a few days, and eaten in less time than that, because a new, soft cheese like that will eat like bread almost.

MR. SPOONER.—Don't you think you could have made a better cheese for home consumption by not developing any acid, and using more salt?

MR. VAN LEEUWEN.—I think we could have done that. I never made any sweet curd cheese until I came here. I developed just a very slight amount. Of course, you see, developing only $\frac{1}{8}$ inch, and drawing the whey and salting and bringing to the press as soon as you can, you do not get a great deal of acid on that kind of cheese.

MR. SPOONER.—I say you get a great deal if you let it develop in the whey.

MR. VAN LEEUWEN.—When you have $\frac{1}{8}$ inch, and draw your whey and salt and put it to press, you get some acid, but not a great deal.

MR. SPOONER.—Was your cheese porous any?

MR. VAN LEEUWEN.—Yes, some of them would be quite porous. The last few years I have not made any of this cheese. I have worked up a trade on a good firm cheese—a solid, hard cheese, but a good, firm, smooth texture. Those cheeses you can sell them and if they are not consumed immediately, they give good satisfaction.

MR. DECKER.—At what temperature could you keep your curing room?

MR. VAN LEEUWEN.—In the hottest days of the summer, we had a temperature of 80 degrees a good deal of the time; i. e., some parts of the day, between 12 and 2 o'clock.

MR. ADERHOLD.—Would it ever go to 100?

MR. VAN LEEUWEN.—Well, no. I never had it at 100. We had our work-room below, and the pressing and curing room directly above, and an elevator. The curing room was plastered, and at both ends—or at one end and partly on the other end—we had a room, so that there were only two sides that had the direct sun's rays. And this curing room was plastered on the inside, and just sided on the outside. I cannot say whether there was any paper, or any extra preparations. I think that it has double layers of boards, and the plastering.

MR. DECKER.—Would it not have been better if you had the making room above, and the curing room in the basement?

MR. VAN LEEUWEN.—Well, we could, of course. The milk would have had to be elevated then.

MR. ADERHOLD.—Didn't you have to elevate the whey to get rid of it?

MR. VAN LEEUWEN.—No, sir. The factory is on a slope, and the whey runs from the ditch in the room to the whey-tank, and there is a pump in the whey-tank that the farmers get the whey with.

MR. BAER.—How do you handle your whey? Is your tank cleaned out every day, or do your patrons haul it back in the cans that they haul the milk with?

MR. VAN LEEUWEN.—I would say that the tank is cleaned every day, and the patrons haul it back in the cans, which, of course, is not right. But that is what is done, and I do not think that we are the only ones that do it.

MR. SCHOENMAN.—Do you think you will change when you get back to Iowa?

MR. VAN LEEUWEN.—Well, I do not know whether I will or not. I think

there is not an intelligent cheesemaker who does not know that returning the whey in the same cans is the improper thing, but to get our patrons to do differently is another question. And of course if we try to agitate this question, we may get four-fifths of them to consent to it, and if we do not get the other fifth, we are going to have the contamination from that whey, and the evil effects of it, just as much as if they all took it back in the same cans. Nine times out of ten the one-fifth are the ones from whom the trouble comes, because they are generally the patrons that are not particularly clean and neat, and do not see the advantages to be derived from such particular precautions. For that reason I think we would get the injurious results anyway, if there would be that one-fifth who would refuse. I think that in a large factory it might be done, and you could lay down strict rules.

MR. ADERHOLD.—Supposing you put it to a vote, and that four-fifths were in favor of it and the other fifth got to balking, what would you do about it?

MR. VAN LEEUWEN.—If I made up my mind to it, and had sufficient patronage, I should say that they could keep their milk.

MR. FAVILLE.—Is such an effect produced if the can is properly washed?

MR. VAN LEEUWEN.—Just as I say, it would be that one-fifth who would not properly wash the can, and purify the can by airing. I do not think we would have a great deal of evil effects from that process, but that one-fifth that would refuse to do it would be the very fifth we would get the evil effects from.

MR. FAVILLE.—The question I was raising was whether it would not be a good deal less trouble and easier to do, if they took proper care of the cans, than to make them all bring different cans to take their whey home in. It would be less work to watch them and see the dirty patrons. There are always some.

MR. VAN LEEUWEN.—I think that is a fact. The way I do; I first notice the can when the milk comes in. If I find anything wrong with the can, I refuse the milk. If they have left their whey in all day, and have not thoroughly washed it out all day by bringing your hand around in the can, you will find a sediment, and you can safely say that they have not used proper care.

MR. FAVILLE.—You can find that in cans that had no whey in them.

MR. WINSOR.—I think we should see to it that the vat is properly cleaned out, quite often. I put steam-pipe connections into my whey-vat, and washed it as often as I could. Of course, we cannot wash it every day. Practical cheesemakers know that there comes a rush at times when we cannot get to clean our vat every day.

MR. ADERHOLD.—I think that where the whey is scalded it removes the injuries that are liable to result to the cans from vat-flavored whey, to a great extent.

MR. FAVILLE.—Does not the whey keep sweet longer?

MR. ADERHOLD.—Yes, sir.

MR. BAER.—You have either to wash those cans out at the factory, or return the whey in the can. It will not do to send the can back in the hot sun without having whey in it or having it washed.

MR. SCHOENMAN.—I think that cheesemakers should direct all their efforts toward having a clean whey-tank, and have the whey scalded, and not try to have the can sent home empty. We all know that the way some whey-tanks are it would be impossible for anybody to deliver good milk unless they are very careful, because there are any amount of tanks that are not washed the entire season, and that is where the trouble comes from.

MR. MONRAD.—If you want to have your patrons take care of the cans, you must have clean whey-tanks, so as to set a good example.

MR. POWELL.—If there is nothing further we will close this discussion. There is only one really essential point that you have missed: i. e., a good can. There are lots of cans where the seams are not soldered flush, and they cannot be properly cleaned. All factory-men, when they are buying, should take pains to get them that way. They are putting them up that way, most of them. I bought some at one time (I do not know that they came from a supply house—I would not accuse them of anything of the kind), but you could take a knife and run it around below the seams and get out a lot of sediment. I made them take them back, and their tinner seamed them all over and brought them back in good shape.

The Secretary informs me that Mr. Spooner will not be here, and he has not

sent his paper. He had one of the most important subjects, in my mind, connected with cheesemaking. His subject was "How to Educate the Patrons so that None but Good Milk will be Delivered." Well, if he could have told us how to do that, we would be indebted to him. Perhaps it was too big an undertaking for him, but I should like if we could take some time for a little discussion on this. I think that is where the greatest trouble lies with our poor cheese, in Wisconsin—right with the patron, and the cheesemakers in lots of places are almost powerless to remedy this alone. We have our instructors whom we send to them. They are a great deal of help, and I want to hear from them in regard to this. I was around a good deal last summer, and found places where they did not keep the factories clean enough. It reminded me of the city of Madison, for instance, choosing to neglect her sanitary conditions, having lots of sickness and malaria, and sending a physician to relieve them, while they were doing nothing for the sanitary conditions. The instructors come for a day or two to a place, and give them temporary relief. They help them out, but they have not the time or the power to get at the root of it. There are lots of good cheesemakers that I know are capable of making good cheese, who make an inferior quality of cheese all summer because they cannot get good milk to make it out of. Now, I want to stir this up, and let us hear from many here.

MR. MASON:

Mr. Decker called on me last summer and said something that I have thought of a good deal. In the first place, he said that there were a great many of the boys that left the school that were capable of making good cheese, but they did not have the sand to send milk back home when it was poor. Another thing was this: that there are many cheesemakers (and we know it), that did not set a good example for the patrons. You cannot scold a patron for not being clean if you are not clean yourself, and I think that is one of the most important things that a cheesemaker has to do. First, he wants to be sure to keep his own factory very neat and clean, and then he has a good reason to go for them if they do not bring good milk.

MR. DECKER.—I want to just say that Mr. Mason has made a great success of his work this summer in his factory. He went to a factory that was quite dirty, and he hired somebody to go in and scrub for two or three days,—just scrub, scrub, scrub, and he got his factory in good shape, and his cheese has gone better for a good many years. He practices what he preaches.

I know of a maker that was in a factory not very far from Neenah where they had trouble,—more or less rejections. Another cheesemaker that went in there had good cheese right along. Said it was fun to make cheese. He did not have trouble, but he did reject any milk that he thought was poor, and it is a very important thing to reject milk that shows up poor.

There has been one point where the cheesemakers have been under a disadvantage. The patrons have asked them to guarantee their cheese, guarantee their make. When the milk comes in cold at the factory, it has been impossible to tell exactly how that cheese is going to show up,—whether of bad flavor later, or not; but with the test which has been in use for some time, this disadvantage can be overcome, to a great extent. It was used some by students last summer. There was some discussion brought up last year at the convention. All the students at the school have been taught the use of the test this winter.

Q. What test do you refer to?

MR. DECKER.—It is the curd test. The milk is curdled and the whey drawn off, and the curd allowed to remain. In that way you are enabled to discover gas or bad flavor. There is another cheese factory where they had trouble with the milk, and by the use of this test they traced the trouble down to three cows last summer, and they put out those three cows' milk, and they had no more trouble. The difference was something like two cents a pound in their make. The cheesemakers have something now in this test by which they can locate the trouble.

MR. ADERHOLD.—What kind of outfit do they use?

MR. DECKER.—It is a pint bottle, the same as a sample bottle. During this past summer the University creamery has offered an extra price for good milk, exceptionally good milk. There are certain rules that the patrons have to follow out. They had to fence in any sink holes, they had to clean out their barns, and air their cans, and there is a great change in the quality of milk that is being delivered. They are getting a higher price for their milk.

MR. POWELL.—I think all those tests are a great help, and if the cheesemaker is wide awake, he can get really good milk. But it ought to be perfect, and it will not be perfect unless he can get those farmers interested in it. He cannot drive them to it. I know of one little place, and it is the only place I did know, where I got them really interested. About a year ago last summer I went out to buy some cheese for a Chicago firm. In the northern part of the state there were two factories about three miles apart. They were rivals, although friendly, and I went through each one of the factories. The salesmen of the two factories were farmers, and were both in town, so I went to the town and found the two men, and found them both together. I offered one half a cent more than I did the other for his cheese,—said I would make that difference, and this one whom I had offered less money wanted to know whether his cheese was not as good as the other. I told him I thought he had the best maker of the two. I liked the looks of his factory better, and the style of his making, but his cheeses were not as good. They were bad-flavored, and I told him I thought it was the patrons' fault entirely, and he said if that was the case he was going to find it out. He called the patrons together and explained to them, and made them believe that they were to blame for taking a half cent less for their cheese. I was there about a month after, and they had the best cheese in that factory—better than the other, and they have had meetings at both factories. They had as near perfect milk as I ever saw in a factory in hot weather. The patrons themselves have got interested, and if you can get them interested and make them think that they are going to get more money out of it, and take pride in it, you can get perfect milk.

MR. VAN LEEUWEN.—I think that the way we are going to interest them is to reject that milk, because if we reject it, we touch them—we touch their pocket-book, and whenever they send in a bad mess of milk, and we reject it, giving the reason, you will see that that will not occur again, if it is possible, because it is a loss to them, and whenever they lose, they are going to look after their own finances.

MR. POWELL.—That is true, but is it not a fact that very few patrons next time will take care of it, just so you will not reject it? They will only try to see how near they can come to delivering bad milk and have you take it.

MR. ADERHOLD.—That is the reason the maker ought to visit the patrons in the evening, and see how they handle their milk, and you cannot get perfect milk unless you do that off and on. You cannot get good milk if you would rather have huffy cheese than huffy patrons. The cheesemakers have not backbone enough to make a man come to time. When a man refuses to do his duty, after you have told him what he ought to do, you have to tell him, too, what he ought not to do. You have to put the question to him like this: "Are you going to do it, or are you not going to do it?" And make him answer that question, and if he says not, tell him to quit the factory at once. Everybody seems to be afraid of losing a patron, but I always used to feel better when I got rid of such a patron. I used to swear that I had a better lot of patrons than I had before. I would rather lose them all than to have to quarrel with them and work up poor milk.

MR. CARSWELL.—I would like to say a word in regard to Mr. Aderhold's remark about visiting the patrons. The average cheesemaker in the state is routed out at 5 o'clock and is kept working until 7 o'clock, and then he will not get a great way from home in visiting. There is another system that is wrong, and that is to have the cheesemakers guarantee their make. Under all conditions it makes him responsible, and the farmers as a class will work and figure in any way, shape or manner to get him to take in the milk, and then the cheesemaker must be responsible. And many mornings in the rush some poor milk will slip through, and even lots of times I have known them to wait until the rush was on, so they can slip it through.

MR. ADERHOLD.—I tell you if you have good milk, and know how to work it up, you would have plenty of time to see the patrons. In most cases, when things are working right, you can get to work at eight or half past eight o'clock, and in seven hours you can be at liberty to go. Several days in the week at least you can be at liberty at four o'clock; especially where there is a helper, they can get out frequently at two o'clock, and it gives them lots of time to the patrons. You can jump on your bicycles (and every good citizen ought to have

one), and you can see half a dozen in one evening, and see where they keep their cans. Look at their pails. You do not always see their pails, but they have pails and strainers. If they do not have aeraters, they ought to have. Every maker that does his duty has to visit the patrons and see what condition their things are in on the farm. Another point that I have to raise, and have several times, before (I did not want to raise it, because I have been harping on that so much) is, you have to talk to the women-folks about keeping their utensils clean. A good many communities where cheeses are made are composed of Germans, Scandinavians, and others, where the women largely do take care of the milk, and do a good share of the milking, and their husbands are not as intelligent about some things as the Yankee men are. If the cheesemaker finds fault with a can at the factory, he comes home and tells the women. He does not explain anything. He simply tells them, and there is a row there, and the cheesemaker is blamed for not knowing anything. He does not explain the cause to her. But if the cheesemakers would take the pains to go around and show up the defects in the manufacture of those dairy utensils, something might be accomplished. Most of the women are neat, and when they wash anything they do not like to have anybody say that it is not clean. But it is impossible to clean them. They do not know it, they do not know the reason why, and get angry when they are told that it is not clean, but if the cheesemaker could show them where the fault lies, there would be a good deal better feeling, and they would see that those things were true.

MR. FAVILLE.—That point was right well taken, and took me back some eight years ago. One of my patrons brought me milk, and I found fault with it. One morning his wife came with him. She was the most intelligent man of the two, by odds, and I liked to talk to her a great deal better than I did to the man. I talked with the lady awhile and told her about it, just as Mr. Aderhold has been telling you. The upshot was that it corrected the thing right from the start. I do not think there are a great many patrons of the cheesemakers that want to be mean about it. They do not know about it, and are careless, and they want information more than coercion. But Mr. Aderhold is asking pretty heavy of the cheesemaker, unless they are having it easier than I had it, and unless you fellows have got your bicycles and can get around, and have more time than I had then. I could not run around to see my patrons.

MR. ADERHOLD.—You did not use a starter, or you would have had. The cheesemakers should get around and watch those things.

There is not anything very mean about the farmers, but there is a good deal mean about the factory owners, especially where factories are close together. If the milk is refused, the patron will haul it to the next man, and the next man takes it. He hardly dares to refuse the milk. He loses his job if he loses his milk. I visited a factory down in southern Wisconsin one day, and I sent away three cans of milk one morning. The patron hauled it to another factory, and the cheesemaker told him he never wanted to see a better milk than that was.

MR. VAN LEEUWEN.—I think that a great deal may be done by good instructions being printed and sent to the patrons. Then if any milk comes in bad, we can reject it. Of course, if we reject it and do not say anything about it, it may create ill-feeling, but if we tell the patron about it, or send him some word as to what was the fault there, and ask him to do the best to remedy it, we can avoid taking all that time of going out to see him, and we can accomplish a good deal. Not as much as by a personal interview, perhaps, but sometimes that is impossible, and by just sending out a notice to him in the right way, we will accomplish a great deal that way. If we just go at them in a rough way and scare them, they will not do it as if we came at them in the right spirit and show the reason, and ask them to remedy it. That will accomplish a great deal, I think.

MR. CARSWELL.—In a good many localities in this state, as Mr. Baer states, are several factories, of four or five hundred pounds capacity, all wanting milk. I know many of them within four miles of each other, all in a bunch, and all competing for a little milk, and the farmers think they are conferring a favor on the factory to give them their milk. If you investigate their affairs very closely, they will say: "This man over here is just as near, and we will haul our milk over there."

MR. POWELL.—How are you going to remedy it?

MR. ADERHOLD.—I have been told to shut up once, but I am not going to do it. I think I can suggest something that will partially remedy that. I notice there are several boards of trade in Wisconsin where the market price is held down from a quarter to a half cent too low, in order to shut out other markets, and there is not much discrimination in the prices paid for those goods. They take them good, bad and indifferent. They make some discrimination, but not enough. There is no incentive there for the cheesemaker to make much of an improvement, but I notice where there are boards of trade, like Hortonville, for instance, and Appleton, where the buyers have boomed the markets for years past, and discriminated in the prices paid for the cheese according to the quality, that the makers are doing a great deal better than they are at those other boards of trade, and I think that is the only key-note to success in this direction, because you cannot compel a maker to improve unless he is losing money. If he can slip through without any loss, he is going to keep on just the same, but if he has to either quit or get a hustle on him—either one of the two—he will improve. That can be accomplished by discriminating in prices, and I think that is the only way it can be accomplished. You cannot get them here to the convention, you cannot touch them in any way. You have got to hang them or make them improve.

MR. MASON.—I do not want to contradict this gentleman's statements, but I would like to hear a great many more ideas about how to reform the patron or make him come to time. Now, Mr. Decker has given me credit for cleaning up this factory, and I appreciate it very much. I will say this: When I came to this factory, under the press there was about 1½ inches of dirt and grease, and the slabs had not been cleaned for about five years, nor the press, nor the vat, nor anything, nor the sides of the building. I hired a man for two days out of my own pocket, and had it cleaned up, and got my factory looking pretty fair, and I believe as firmly as can be that the key-note with the patrons in regard to making them bring a pure milk is this: If the cheesemaker is absolutely clean and is very particular in all respects around his factory, that the patrons, somehow or other, will take the hint without being told lots of times. I went to most all of my patrons, and, as suggested, talked to the women-folks a good deal, because they were Scandinavians, and you know that they do most of the milking. The first place that I came to the lady was just washing the can. When I came there it was about half past four in the afternoon, and the whey had been in the can since they emptied it at noon. I told her that I had been at the dairy school, where they say that it was impossible for a person to leave whey in the can six or seven hours, and let it become contaminated as bad as that was, and get it perfectly clean, and I thought it would be better for all if she would clean the can as soon as it got home. Well, she said she did not know it made any difference, so I explained to her as well as I could what caused it, and told her what a bad effect the whey did have on the milk, and how impossible it was for her to get the can clean again, but that she would find that they would have no trouble in keeping the milk if they followed my advice. I made a suggestion to them to tell when their milk was good. "Stir it around, and if the cream will dissolve back into the milk without clotting, you may be sure that your milk is all right. If it does not, if it clots here and there all over the can, you may be sure that you have not taken good care of your milk. That is one idea that you can take and you watch that closely, and you will find that you will have good milk.

MR. ADERHOLD.—How did you leave the factory early enough to see that lady by half past four?

MR. MASON.—I used a starter. I used to get through, on an average, about six o'clock, but when I had any patron that I wanted to call on and see about taking care of the milk, I used to leave some of my milk until after I visited them. But usually I never left my factory until six o'clock.

MR. AUSTIN.—I left my factory on an average about half past ten or eleven. I think Mr. Baer will testify to that while he was there. I would have no trouble getting out before noon any time.

MR. BAER.—Mr. Austin's factory is up on one of the highest points that there is in southern Wisconsin, in Grant county. They have to go four or five hundred feet for their water, and their wells were all dry and they had not a drop of water to cool the milk at the time he speaks of. The milk was coming in, and

we sent everything home that was too thick to pour out of the can, and the rest we took; and we did get through about eleven o'clock.

MR. MONRAD.—Why didn't you tell them to make schmier-kaese?

MR. BAER.—They had to drive the cows $2\frac{1}{2}$ miles to get a drink from that factory.

MR. AUSTIN.—Would it not be a good thing if the cheesemakers would hold together, and if the cheese were to be inspected at the factory—if this would not stop some of the competition in our competitors taking milk we would reject, and consequently losing our patrons? It seems to me if we hold together and sell our cheese on its merits, the patrons would soon find out that it was hurting their pocket-book in that way.

MR. POWELL.—I think Mr. Austin has touched the keynote. There are a great many factories who have trouble from the salesman. He goes and sells the cheese at the board of trade price. The cheese is not inspected, and goes into the market. It is rejected. The cheesemaker says the cheese is all right, and the salesman tells the buyer it is all right, the cheesemaker says so, and lots of times it is laid to the cheese-buyer when it is the patron's fault, or the maker. They have a chance to get around it. Each one lays it to the other, and consequently there is a little squabble back and forth. But it ends there, and the next batch is just as bad, only they sell to another buyer. The thing goes on in that way year after year. I know of a factory right in the best part of Wisconsin, whose cheese I do not believe gets the board of trade price three times a year, for his whole lot of cheese.

MR. WINSOR.—I would like to ask if we could not possibly get a meeting of our patrons once a month at the factory, and thereby do a great deal of educating, and do it at the expense of the patrons, and not at the expense of the cheesemaker running from his work. If we could get a right interesting meeting once a month, either at the factory or near by, before one season was over we could get good effects.

MR. ADERHOLD.—I think if you undertook that you would find it just as we do here. Those who needed the instruction most would keep away.

MR. VAN LEEUWEN.—I think we would find that same trouble. Those that we wanted at the meeting would be the ones that would not come. I think an important thing for the cheesemaker is that of guaranteeing his milk, under all circumstances, to be first-class. He is making a mistake when he does that. He cannot do it, and I think it shows a cheesemaker does not know his business when he guarantees it to be first-class, because when a bad mess of milk comes in, and he is working under those difficulties, his cheese will not be first-class. If he puts in a provision that "I will guarantee my cheese to be first-class providing I have the rejecting of all milks that are bad and have the proper machinery," then he can guarantee his goods. Otherwise the patrons will put in the milk just so it will pass. The cheesemaker has to make up his goods or lose his place.

MR. ADERHOLD.—I would like to ask Mr. Mason where that factory was that he operated. I should judge from the description of the condition in which he found it that it was in Ozaukee county.

MR. MASON.—It is two miles south of Black Earth. One thing I would like to say is this: I have made cheese now three years, and I do not know but I have been in as close competition with other factories as most any one. Jefferson county is pretty well settled with factories, but I never lost a patron in all those years because I rejected his milk when it was poor. Now, whether it is due to the way you present it to them or otherwise, I do not know. But I think they make a great mistake when a man's milk is poor, if they go at him mad and disagreeable. It makes the farmer mad and he leaves, but if he takes the farmer in a good-natured sort of way, and explains it to him thoroughly, I do not think he will leave the factory, if he sees that his milk is poor.

MR. SCHOENMAN.—I think that what Mr. Mason said just now is a great thing in cheesemaking. A man has to study his patrons. I will say it is the same here. I never lost a single patron for sending home the milk in my ten years of cheesemaking, because I would go at him in a careful way. I would perhaps go to his house and visit him, and talk about it, and see where he kept it, and then I would ask him some questions and what he thought about it, and try to show him in such a way that his milk was off; that he did not keep it in the

right place; that he had to improve it, or some way like that. And you will find that nearly all successful cheesemakers know how to handle patrons in that way.

MR. MASON.—I want to give an incident that happened to me some time ago in regard to a man that was very ill-tempered. His milk smelled tainted with onions, and sometimes with potatoes. He was one of these men that you could not say anything to him without his getting mean. I called on him one night and sat there talking with him, and he had his can right near where there were a lot of onions and potatoes, and his well was near there, and the can standing near by was contaminated with the smell. I lead him to the idea, asking him if he had ever heard that milk was a great thing to be contaminated with anything that was near by. He said: "No," he had not. I told him that one of the worst things with it was that milk, when it was warm, would take on taints like onions and potatoes, and so on, and he said: "Well, now, may be my milk smells from those onions?" "Yes," I said, "I noticed it the last three or four days. I was just coming over to see if it was so." "Well, now," he said, "if that is the case, I can soon remove that," and he did, and his milk was not bothered at all after that.

MR. SCHOENMAN.—Well, I guess I will have to tell you my story. I found out that there was somebody bringing potato-milk. The curds were badly tainted with potatoes. The next morning when the milk came I tried to find out who brought this milk, and I found out by looking after it pretty closely who the man was, but he was an over-cranky man. If I had told him that there was something wrong with his milk, he would have left me. I never said a word. In the evening I hitched up my buggy and took my cheesemaker along, and we went over there. They were milking and tending the horses. We went into the barn and commenced to talk about his cows and horses. He was a very nice man, but he had that cranky notion. We talked for a while on one thing and another. I said: "By the way, do you know that potatoes are one of the worst things on God's green earth to taint milk?"

"No, I did not know that."

"Well," I said, "it is."

He said: "By the way, my milk is in the cellar where I keep my potatoes, and they are rotten, too."

Well, that is a pretty bad place to keep milk, and so I said: "Will you keep your milk separate tomorrow?" He kept some upstairs, what he wanted to keep, and this he kept in the cellar. He said he would. In the morning he opened the can, and I said: "Can you smell? We cannot use that milk." "Well," he said, "I suppose I have to take it back and keep my milk out of the cellar."

MR. ADERHOLD.—I would like to ask if there are any students or cheesemakers here who have had experience with the milk from cows that were fed potatoes? What the results were?

MR. WINSOR.—I think I can answer that question in part. A few of my patrons have fed what I considered to be light meals of potatoes—18 to 20 pounds of potatoes a day. Near that amount, but 20 was the highest. I did not want them to feed more than that. I did not experience bad results.

MR. ADERHOLD.—Was there any particular time of the day when they fed those potatoes?

MR. WINSOR.—Fed them in the morning. I did not see that it showed up in the milk or in the curd.

MR. SCHOENMAN.—I want to know if any one had any experience from cows eating acorns.

MR. MASON.—In the locality where I was acorns were very thick, and the cattle ate them by the bushel. I could notice it in the curd when I was making the cheese, and I believe that it would have affected the cheese a good deal if I had not used a starter, but by using a starter I did not see that it affected the cheese at all. But I could smell it in the curd.

MR. POWELL.—Can you not taste it better than you can smell it?

MR. MASON.—Well, I never taste the curd, so I cannot tell.

MR. POWELL.—I know that sometimes I could not detect it by the smell at all, but could detect it in the taste.

MR. CARSWELL.—I have made sweet curd cheese and brick cheese when the cows were feeding almost entirely on acorns, and while I could test it in the curd, bitter and tough, after the cheese cured up sixty days, I would notice it,

but I do not know but what the other flavors had got so strong by that time that I could not discover it.

MR. SPOONER.—I have made cheese quite a good deal, and I noticed that those gentlemen that complain of receiving poor milk, in such poor condition that they had to send it home, all seemed to use a starter. I think this using a starter is bad practice. Where I made cheese last year we had a pretty hot summer, and once in a while we would get a little milk in that was not very good—sometimes a little sour. Well, I would just tell the man I could not take that milk in. I did that a few times, but sometimes when milk was only just slightly turned, and I found that I was getting in very sweet milk, I did not reject it. I made cheese in Canada five years. I made cheese in New York ten years, and I ran one factory down in Rochester, not a very large factory, six years. We got pretty hot nights down there, and I never lost a cheese in that time. I always advise my patrons to cool their milk as quickly as possible after they had milked it, and I see that is condemned. Well, now, it is pretty hard for patrons to keep milk sweet unless they do cool it. While I believe that milk can be kept if it is properly aerated before being put in water, still, as a rule, the trouble is, farmers would not aerate it sufficiently to keep it unless it is put in water and cooled. Last summer we did not make a cheese on Sundays, and in the very hottest weather, on Monday morning most every one of those patrons brought in their four milks, and I took it all in. I found that that cheese was just as good, and the yield just as good. I think there are some cheesemakers perhaps as much to blame as patrons. I know I was in one factory a year ago, in the fall of the year, and there was not a good cheese in the factory. Not on account of the milk being sour, but because the cheese evidently had not been cooked enough, and they were too soft, so that the milk must have been sweet. Now, there are a good many cheesemakers here, and I think if we could get the information we would like from those men that seem to understand their business, it would be proper to ask how they make this cheese. I like to get information from anybody, and particularly from a man that can make good cheese. Sometimes some of us will talk about making cheese and perhaps we do not understand it. In my factory last year we did not have any poor cheese, and I had to guarantee those patrons good cheese, merchantable cheese. I had a good salary. I was allowed to reject all milk that did not come in good condition. That was the agreement. I was perfectly satisfied to do that, and I think any cheesemaker would be. If he is getting a good salary and he is allowed to reject any milk that is not good, why then I think he is perfectly safe.

MR. ADERHOLD.—Did you ever use a starter, Mr. Spooner?

MR. SPOONER.—I never did.

MR. SCHOENMAN.—I would like to ask the gentleman how he would handle a contaminated milk, with a bad odor, without a starter.

MR. ADERHOLD.—Take, for instance, a batch of milk that has a taint of such a nature that it works against the acid, and keeps the acid several hours, while the milk is getting worse all the while. How would you handle that without a starter?

MR. SPOONER.—Well, I did not have any of that last summer, but I did years ago. That would make what we called a floating curd. If I should have any of that kind of milk, I would use a starter, but I have never been troubled a great deal,—sometimes, perhaps two or three times in one season. A few years ago I was troubled only in September, when we had very hot weather, but in cases of that kind I would use a starter.

MR. SCHOENMAN.—I would ask the gentleman how he would get that starter if he was not in the habit of saving out a starter? Where he would procure a starter if he had none on hand?

MR. SPOONER.—I should have to have, certainly, some sour milk. I might not have it just that day, but I could tell a good deal by the weather and the condition of the temperature if I was likely to use one. It takes a number of days of heavy weather before I find that we have a floating curd.

MR. POWELL.—This afternoon's session will be devoted to the National Dairy Union, and it is something to interest all of us. We have something on the Trade-Mark Bill, and a discussion of needed legislation.

I would like to ask Mr. Monrad a question. At the last meeting of the Utica Board, Utica, N. Y., I noticed that there was a resolution passed endorsing a

man from Morrisville, or off south there somewhere, for an appointive office of butter and cheese inspector. Do you know what they are, Mr. Monrad?

MR. MONRAD.—I do not, exactly. They have a great many state officers. I think that it is a man that would act as a sort of arbitrator between the buyer and seller.

MR. POWELL.—If there is no objection, we will stand adjourned until 2 p. m.

Convention met pursuant to adjournment at 2 p. m. President Powell in the chair.

PRESIDENT.—The session this afternoon, as was announced before dinner, will be devoted to the session of the National Dairy Union, which is an auxiliary of our association. I think Mr. Noyse is president of that, but as he is not here, we will call the program as it is printed. The first on the program is "The Trade Mark Bill" by Mr. D. W. Wilson of Elgin, Ill.

MR. BAER, Secretary.—He is absent. Mr. Decker, secretary of the Wisconsin Auxiliary of the National Dairy Union, will read Mr. Wilson's paper.

PROF. DECKER.—Before we take up this paper I wish to say a word in explanation, so that those here may understand just what the Wis. Auxiliary of the National Dairy Union is: "United we stand, divided we fall," is an old proverb the truth of which is ever coming up for new demonstration. Another way of stating it is that there is power in organization. The great trusts or combines are powerful because a number of men or corporations sink their differences and work together for a common purpose.

The manufacture of filled cheese has had a rapid development during the last few years, not because it was a superior article of food, but because it was a counterfeit passed off in the name of the genuine.

The manufacturers of full cream cheese were more numerous than the filled cheese manufacturers, but the latter were practically united in their efforts to extend their business, which extension meant the ruination of the honest cheese business.

A few men saw that the salvation of the genuine article could be accomplished only by the organization of the pure food men; accordingly a meeting was called in Chicago four years ago to effect such an organization and the result was the National Dairy Union. The constitution provided for auxiliaries in the different states, and about two months later the Wisconsin Auxiliary was organized at the Cheesemakers' Convention held in Madison, and ex-Gov. W. D. Hoard was elected president, A. C. Van Elston treasurer, and myself secretary.

Filled cheese was then being sold as genuine, and the first move of the Auxiliary was to assist in securing the law prohibiting the manufacture and sale of filled cheese in the state. A law was also passed by congress putting a tax on filled cheese and putting the collection of the tax into the hands of the internal revenue department.

All such cheese must be branded in large plain letters just what it is so that the consumers know what they are buying. It is no injustice that an article be sold for just what it is, and since justice has been done to filled cheese, less of it, and more of the genuine article has been sold.

The passage of this law was accomplished by the united efforts of dairymen and dairy organizations all over the country, but its inception came from the Dairy Union and the Wisconsin Auxiliary did no small part in helping it along.

There is yet work to be done in helping other states to secure proper dairy legislation and in securing a National Trade Mark Law. As Mr. Wilson's paper discusses this law I will not take up your time to speak of it here.

It takes money to pay postage on circulars that must be sent out, clerk hire, etc., and there is no big trust at its command to furnish the funds necessary, so that the money must come from the dairymen who are benefited by such work.

Our honored president, W. D. Hoard, and a few others have already given

more time and money than should be asked of them, and you are reaping the benefit in better prices and a healthier market. It is your turn to do something, don't wait until you forget about it, but hand in your dollar now to Mr. Elston.

The following is the constitution of the National Dairy Union:

CONSTITUTION OF THE WISCONSIN AUXILIARY DAIRY UNION.

Section 1. The name of this organization shall be the Wisconsin Auxiliary Dairy Union.

The objects shall be: 1. To secure national and state legislation to prevent the manufacture and sale of food products made in imitation or semblance of pure butter or cheese, and also to prevent the sale of adulterated dairy products. 2. To assist in the effective and thorough enforcement of existing laws, and such future laws as may be enacted for the purpose set forth in the first section.

Section 2. The officers of the Union shall consist of a president, secretary, and treasurer, and a vice-president from each county in the dairy section. The above officers shall constitute a board of control, of which five shall be a quorum at any stated or called meeting.

Section 3. The president, secretary, and treasurer shall be elected by ballot at the regular annual meeting, and the vice-presidents elected by the board of control. The board of control may fill all vacancies in the list of vice-presidents. The officers shall hold their offices until their successors are elected and qualified.

Section 4. The duties of the president, secretary, and treasurer shall be such as are usually performed by these officers, and it shall be the duty of the secretary to prepare an annual report and furnish a copy of the same to each member of this Auxiliary Union.

Section 5. The treasurer shall receive and account for all moneys of the Union and disburse the same on the written order of the secretary, approved by the president, and shall give a bond in the penal sum of five hundred (500) dollars. At each annual meeting the president shall appoint two members to audit the accounts of the Union with the treasurer.

Section 6. The board of control shall have charge of the business and affairs of the Union, not transacted at the annual meeting. A meeting of the board of control may be called by the president and secretary, notice of which shall be given to each member at least ten days before the meeting, through the public press.

Section 7. The compensation of the secretary and treasurer shall be fixed by the board of control, and no other officer shall receive any compensation except for actual expenses incurred when in discharge of his official duties.

Section 8. The annual meeting shall be held at such time and place as may be fixed by the board of control, notice of which shall be published at least one month previous to said meeting.

Section 9. Any manufacturer of, or dealer in, dairy products or dairy supplies, upon the recommendation of any member of the board of control and the payment of the sum of three (3) dollars, may become a member of the Union, and be entitled to all the privileges of the same. Any other person recommended by a member of the board of control may become a member of the Union by the payment of the sum of one (1) dollar.

Section 10. One-half of all the fees of this Auxiliary Union shall be contributed to the treasury of the National Dairy Union.

Section 11. The annual dues of each class shall be the same as the regular membership fee.

Section 12. Each member of the Union shall be entitled to one vote, either in person or by written proxy.

Section 13. This constitution may be amended or altered at any annual meeting by a two-thirds vote of all members present.

The second annual meeting was held at Fond du Lac, in connection with the Cheesemakers' Association. The third annual meeting was held in Madison a year ago, in connection with the Cheesemakers' Association, and the call has been issued for the meeting in connection with the Association again this year. The officers elected at the meeting a year ago were, H. J. Noyes, president, J. W. Decker, secretary, and A. C. Van Elston, treasurer.

The work of the Union this past year has been in the raising of funds to assist

in securing the passage of the Filled Cheese Law. The Auxilliary paid the expenses of a trip to Washington in the interests of this bill by our dairy and food commissioner, Mr. Adams, and it was largely through his efforts that the bill was passed. And the work of the Dairy Union has been practically that. There is a little money remaining in the treasury, as will be shown by the treasurer's report, and perhaps we had better have that now.

MR. VAN ELSTON.—

There was on hand at the time of the meeting.....	\$97 50
May 15, received from Mr. Decker.....	31 96
May 17, received from Mr. Decker.....	15 16
Total receipts.....	\$144 62
The disbursements amounted to one check only, which was furnished to Mr. Adams.....	110 00
Leaving in the hands of the treasurer.....	\$34 62

I have a certificate of deposit from the bank for the amount, which I present.

MR. DECKER.—Mr. Chairman, the constitution requires the appointment of a committee of two to assist the treasurer in the auditing of his accounts.

MR. VAN ELSTON.—I think that is not necessary, as Mr. Adams is present, and the rest of the money is here.

MR. DECKER.—Mr. Chairman, perhaps we may want to know what the work of the Auxilliary will be in the future, and this paper of Mr. Wilson, the secretary of the National Union, will explain what can be done, and then we will be able to go ahead and elect officers and call for members. I received a telegram from Mr. Wilson this morning, saying that business prevented him from being present, which he regretted very much, that he had been here at every meeting up to this time, and that he had sent his paper by special delivery, and I got it this noon. Following is the paper; I should say here that a law was introduced about a year ago requiring the states, or dairy and food commissioners of the states, to furnish trade marks, and that those trade marks should be protected by the general government anywhere in the Union. As it is now, the state of Wisconsin can have a mark or brand on the cheese, and while it may be protected in the state of Wisconsin, just as soon as it goes over the line, the mark can be scraped off, but with the national trade mark it would be protected by the national government.

A NATIONAL TRADE MARK.

By D. W. Wilson, Elgin, Ill., Secy. National Dairy Union.

How best to preserve and conserve the public health and purse in the prevention of the sale of adulterated food products has come to be a problem that is attracting the attention of the civilized world. Our country, by reason of its peculiar political organization has only taken a few steps in that direction in a national way.

It has been the purpose for many years to delegate what is called police powers to the states themselves and to preserve the public health and prevent fraud in dealing in food products, by legislation in the various state legislatures to the extent that it has a compilation of laws or a variety of laws relating to those subjects that are not uniform, and that in many cases work injury both to the consumers and manufacturers and dealers, because laws applicable to certain subjects and tastes are not the same in other states. For that reason it has been thought best by the friends of pure food all over the country that some general legislation by the national government should be had.

There have been but three cases of the successful passage of laws in that direction, one of them relating to lard, the other to imitation butter, and another to

imitation cheese, requiring all three of these articles, when compounded or mixed, to be marked and stamped so as to indicate their real character, and thus advise both dealers and purchasers of the fact that they were not the pure article. All of these various enactments of our general government have been of great benefit both to the producers and consumers of the articles named.

And still with this national legislation, people will still take the chances of selling the fraudulent article for the pure. We know that such is the case in relation to all of these various articles made, and although there are very stringent laws against robbery, burglary, or even murder, these crimes are all committed and people are punished sometimes, and sometimes they are not; but this is no excuse for not seeking further legislation to prevent the manufacture and sale of adulterated food products. By reason of the peculiar political conditions where states are supposed to be independent in their actions regarding their own police powers, there has not been that concerted action toward securing national legislation regarding all articles of food that there would have been otherwise; but it has been generally conceded by the advocates of pure food products that only national legislation can completely and shortly accomplish the objects desired.

A manufacturer establishing himself, say in the state of Wisconsin, finds a market for his goods all over the country. If the laws of Wisconsin are nil, he can manufacture the adulterated article, but when he ships it into another state where laws are more rigid, practically prohibitory, he finds that he has no trade and the dealers are sometimes prosecuted or persecuted in that direction.

Now if a national trade mark could be secured for pure food products by the manufacturers, that would guarantee the goods to the buyers or the consumers, that they were what was expected, and what they were represented to be; this would protect the manufacturers and consumers in all parts of the country. Therefore we look to the agitation directing toward this method of securing for the manufacturers and consumers the protection of the national government as one of the best moves that has been made in that direction. We are not fully posted as to the provisions of the law introduced by Mr. Babcock from the state of Wisconsin, but think it should be somewhat broader, so that not only states, but corporate bodies, individuals and corporations could secure from the national government this protection that would guarantee to them immunity from prosecution in states where laws regarding pure food are in force. It would protect the consumers and guarantee that the articles bought were what they were represented to be.

Should such a law be enacted by our national government, and it seems to me that there is no time as good as the present, when the matter has been so thoroughly discussed, and is uppermost in the minds of the people as it is now. The enforcement of laws of this kind ought to be left to the various states who have food commissioners, and if not it should be relegated to the internal revenue department, while the penalty for the violation of these laws should be made so severe that no dealer or manufacturer could afford to violate them. I would suggest that the penalty connected with the violation of the national trade mark law, if such should be established, should include not only a fine, but imprisonment. Certain manufacturers could well afford to pay heavy fines, like the milk-men of the various cities who have heretofore been fined for selling skim milk. A few days' or weeks' business would more than compensate them for the fines, whereas when they are liable to imprisonment they hesitate before they undertake to commit a crime, knowing that it means not only heavy fine, but imprisonment as well.

It seems almost a necessity at the present time to curb the greed of men and corporations along that line. We know that many of our laws against corporations are persistently violated because the penalties are not severe enough. In our judgment the law introduced by Congressman Babcock is not broad enough or general enough to fulfill the requirements.

If the law can be passed at all, and it may take some time before it can be passed in our national legislature, it ought to be broad enough to include the whole scope of food products, of all products that can be labelled with a trade mark that would guarantee their quality; not only in food products, but along all other lines where there is an opportunity for adulterating or cheapening by using other articles not belonging to the same class. Our republican friends are

strong advocates of heavy duties on wool, to protect the wool-growers. If a law was enacted compelling every manufacturer who puts out a piece of cloth purporting to be made of wool to say that this is one-quarter shoddy or three-quarters shoddy, and sell it at a corresponding rate, the demand for the real article would be sufficient to give wool-growers a much better price, whereas we are now buying shoddy for wool.

We are buying all sorts of things, not only in food products, but along all other lines, that are purported to be one thing, when they are not, and the honest manufacturer, it seems to me, ought to have some way to protect him from this injury and harmful competition by unscrupulous manufacturers and dealers.

Therefore we suggest that this association, and all friends of pure food products, broaden and widen out the scope of the national trade mark law in such a way as to give the whole people the benefit of it.

I am not lawyer enough to undertake to draw up such a bill, but you can find plenty of men who are thoroughly capable and would be glad, I have no doubt, to aid in such work as this, because not only the farmers, but all of the country are sufferers from this fraudulent and injurious competition, not only in food products, but along all other lines.

The great difficulty in the passage of laws regarding this matter is that public sentiment is not behind the movement strong enough to compel our congressmen to take up those questions. They go upon the principle of doing as little as they possibly can, and as one of the congressmen said to me one time when in Washington: "You must remember, Mr. Wilson, that legislation moves along the lines of least resistance" and when large interests see that their profits will be decreased and their business harmed, any movement looking toward compelling honest dealing in food products and other lines will bring to bear great pressure upon our legislative bodies to prevent the enactment of any such laws; therefore remember that if we ever secure laws for the benefit of the people, the people must strongly and unitedly demand them.

That has been the only way in which has been accomplished the legislation that has already been had. The oleo fight is an example, the filled cheese fight is another, and the compound lard, although of a somewhat different character, was another. It is only a question of time, of course, when this question will assume a force and power that cannot be resisted, and it will be our business and the business of all interested in the manufacture and sale of food products, to see to it that the interest in this subject is aroused as quickly as possible.

The farmers are more interested than any other class, because they are the only real food producers in the world, and upon them falls heaviest the burdens of the fraudulent competition in food products. Therefore they are more interested than any other one class, and being as large a class as they are, when they join forces and ask for legislation in their interest, they can have it, and it will be a part of our duty and business to arouse them to this thing as early and as quickly as possible.

MR. POWELL.—This paper is open for discussion.

MR. ADAMS.—Mr. Chairman and Gentlemen of the Association: Mr. Willson labors under some misapprehension of the bill which he discusses in his paper, not only as to the character of the bill, but also as to its authorship. The gentleman who introduced that bill was Mr. Sauerhering, member of congress from this district, and, as I recollect, the bill was drawn by Mr. Birchard, assistant editor of Hoard's Dairyman. The bill is as comprehensive, as I recollect it, as the one which Mr. Willson suggests. It simply provides this, that any state may adopt a trade mark for any product, and register that trade mark with the secretary of the treasury, or with the patent-office, and that it shall be protected by the national government. That is, when we adopt a brand in Wisconsin for Wisconsin full cream cheese, it will be an offense, if this law passes, against national law, under heavy penalty, for any person outside of Wisconsin, handling some other cheese, to label that product "Wisconsin full cream cheese." That is, it secures to Wisconsin whatever advantage merit and make confer,—the protection of a good article. Not only that,—it secures the same privilege for dairymen. The bill I think is an important one and ought to receive national support.

The National Dairy Union had for its primary purpose the enactment of such legislation as will benefit the dairy interests. It was not an organization like the Dairymen's Association, or like this organization, for the purpose of considering the general questions which relate to the dairy business, but its purpose was legislation, and that purpose has been partially, but not entirely accomplished. There is at present in congress a bill pending, to which Mr. Willson refers, and there is also another bill, known as the Grout bill, which is designed to carry into law a decision made by the United States supreme court, to the effect that any state in the exercise of its police powers, may pass such laws as it sees fit with reference to dairy products introduced into that state, even if they are in original package. I received a letter from Mr. Hughes, of Baltimore, saying that he hoped that all the members of the National Dairy Union would do all in their power with their national representatives to secure the passage of that law. Under the decisions of the courts of this state, a law of that kind is not absolutely necessary in Wisconsin, but Mr. Willson writes that in Maryland it is necessary, because the courts do not recognize the decisions of the United States supreme court, and I would say to the members of this association that the committee on resolutions, when they present their report, draw up a strong resolution in behalf of the Grout bill, and provide also that a copy be sent to the two United States senators from Wisconsin. During the past year the National Dairy Union lost its head, Mr. Hatch, the president, having died during the year. A letter from Mr. Willson, sent to the vice presidents of the Dairy Union, of which I happened to be one, some weeks ago, intimated that there might not be any necessity for a meeting of that organization this year. The matter has, however, been taken up since that time, and there will be a meeting of the organization in Chicago one week from next Saturday. Many members of the National Dairy Union feel that it has something to do yet, and if it is in the line of national legislation, it could do something in the way of carrying through legislation that will affect dairy interests in the several states. There will doubtless be measures pending in Illinois, which is the hot-bed of imitation dairy products. The dairymen of Illinois made a magnificent fight in their last legislature to secure such legislation as we have done here, and it may be that the National Union can help them in that fight. If we are secure in Illinois the same stringent legislation which now prevails in Wisconsin, may troubles of surrounding states will disappear, because it is from Chicago, that sink of dairy iniquity, that we get the great bulk of spurious goods that come in opposition with our honest products.

MR. POWELL.—Are there any further remarks on this paper? I see we have Mr. Hoard with us. We would like to hear from him in regard to this matter.

MR. HOARD.—We need some legislation. That is very evident. The country needs it, and the agricultural interests need it, but legislation is in the hands of men who cannot always see what the country needs. They must be made to see. The difficulty is that the agricultural population are men who live on farms, and they relegate the management of parties, political parties, and the management of legislation to professional politicians, and professional politicians are the creatures of the hour, and that is all. And whatever the professional politician thinks will be a popular measure, he will be very likely to get on top of, and claim he originated it. Now the only possible way to make the legislature and the politicians, and all the men who have to do with the machinery of legislation, do the work that belongs to the people, is for the people to make themselves manifest. In 1891 it was the purpose of the powers that be in this state to repeal the dairy and food commission and the farm institute of this state. It was the established order and program. Senator Green came to me in Ft. Atkinson, expressing a very deep concern. He said that it was the purpose of the machine to destroy these two agencies, and he felt very much concerned over it. I said to him I thought it could not be done. He said: "It is the program, and the governor has recommended it," and I remarked to him to go home, to go back to his post of duty, and to stand ready to receive the shock when it came. I was then president of the State Association, and I got out 1,500 petitions to send to 1,500 cheese factories and creameries, and asked them to have their patrons sign those petitions, praying for the retention of these two agencies in our state, and 60,000 names poured in here in ten days, and the program was busted. That was all. It showed that the people must manifest themselves along these lines, and they cannot trust to the machinery of parties or to the machinery of legislation the

execution of their will, unless they make that will manifest. Now, you have in this state today a powerful piece of machinery, if you want legislation. You have 2,500 or 2,600 cheese factories and creameries. You have 130,000 dairy votes in Wisconsin, and all you have to do is to call upon these men to make manifest some intelligent action along the lines you desire. You will get state legislation, and no power on earth can stop it.

In the same way it must be done with the national legislature. I think with Mr. Adams that Mr. Willson misapprehends the scope of this law that is under discussion. While it was in process of preparation in my office, Mr. Burchard and myself had a great deal of talk and discussion over it. There were some things that were necessary to be provided for, some things to be avoided, some things the decision of the United States supreme court passed by, to secure the legitimacy of the work; and he, I think, does not clearly comprehend those matters. Now, if the national sentiment, if the sentiment of the United States,—and I want to say to you, my friends, that the sentiment is very much more keen and alive than we give it credit for,—it can be touched, it can be reached, if that sentiment will make itself manifest in congress. Congress will be very apt to listen to it. But you know how it was with the filled cheese law. You know that a good many of us had to go to Washington. I did myself. There was no provision made for anything, nor for anybody's expenses. There was scarcely any money in the National Dairy Union treasury, and I bore my own expenses, and when I got home, the Sheboygan Board of Trade kindly sent me \$25.00, and that was all I ever received. But men cannot stand putting themselves under constant tax in this way. It is an expensive thing to spend ten days or more in Washington. When it is everybody's business and nobody's business, who attends to it?

Now, I think something practical should be done. I think every cheese factory and creamery in Wisconsin should go to work in a practical way to raise a fund and put it in the hands of the National Dairy Union, and say to that body: "Go ahead with this work," and that it should proceed from those over all the area of our dairy interests in the United States. Why, think of it! If every cheese factory and creamery in Wisconsin gave one dollar apiece, it would be more than there has ever been raised to secure the filled cheese legislation. I collected when president of that association, I collected in dollar contributions, mainly from subscribers to the "Dairyman," and some contributions, but few, from creameries and cheese factories, I collected I think in the neighborhood of \$600.00. The boards of trade of New York, Chicago, etc., collected some more money, but it was used mainly in legislation in Chicago and Illinois, where we thought it would do just as much good. Now the country at large would be very glad to second our efforts, but we must put our hands to the plow ourselves; we must be self-respecting enough to do something for ourselves. The National Dairy Union today languishes for a lack of means to carry out that which we are so very active in resolving for, and that is where the whole question centers. There is a body organized today that, if it had funds, would take hold of congress and the different state legislatures, and proceed to do good work.

Let me give you an idea of the necessity for this work. I have prepared myself, in my own office, something like eight bills, to be sent to different states, and some of them have passed, and we have now legislation coming along up from various states all over the Union, and I want to say to you that there is a crystallizing of public opinion in favor of this movement of the dairymen for pure food. It is crystallizing. The consumer is becoming awakened, and you know there is a great deal of anxiety being manifested by boards of health, and as fast as the bacteriologist gets in his work, it begins to be made apparent to people that food can be dangerously tampered with. Now, in this again, one very practical suggestion that I think can be made is for us to do something for ourselves, in a more practical way. If there is a tax of one cent per cow, and every patron in the state of Wisconsin would pay one cent per cow, for every cow that he owns, into the treasury of the National Dairy Union, I would undertake to introduce all the laws you want in the United States, and carry them through. I remember I had quite a correspondence with Senator Sherman when the cheese bill was in the senate—and I was looking over, only yesterday, some of his letters—and I remember that he said to me that nothing made that possible but the sentiment that came up behind the senate, and that sentiment is

potent and all-powerful. But it is just as negative and good for nothing as the lack of rain in a drouth when it will not make itself manifest.

Before I sit down, Mr. President, I wish to add a few more words. I see before me on the table half of a Canadian cheese that I secured in Canada for the sampling of the boys here—one of the prime cheeses that have driven you boys out of the European market, out of the English market. I want you to look it over. I want you to see what it is, as an object lesson, and when the time comes, Mr. President, it is at your disposal. I think it would be a very nice thing to have it discussed awhile.

MR. DECKER.—Mr. Chairman, Mr. C. A. White, of Fond du Lac, suggested to the Fond du Lac and Hortonville boards of trade—I believe also Berlin—that the patrons of their respective factories should pay in a fee of three cents a cow for all the cows they had, to raise a fund for carrying on this work. I believe that he got between three and four dollars from the patrons of those factories. Now, then, if the work is carried on, the men that do it must have their expenses paid. You cannot ask them to pay their own expenses. There are other men who may be there in the interests of oleo and other interests that have money to spend on legislation. We do not need money to spend in that way. If we have somebody to represent us at the legislatures, and the legislatures know that they are representing the will of the people, they will be very careful what they do; but these men will have to have their expenses paid, and we have simply got to raise some fuel to keep the machine going, and the work will be done. Now, I would suggest that we call for memberships here and raise what money we can right here, and then, as these members go to their different factories, that they take the matter up with their patrons and push it. Not push it as it was done at these boards of trade where only three to four dollars was raised, but push it so that their patrons will come down. There was a factory in Fond du Lac county where the cheesemaker brought it up among his patrons and raised \$50.00. It was simply by pushing it and presenting the matter fairly and squarely to them, and the money came, for it is to the interest of the patrons that they raise the money, for it will come back into their pockets dollars, where the cents came out.

MR. HOARD.—The use of money by the National Dairy Union is not so much to send men to Washington, though it will be proper to have some person who has influence with the national legislature to present them there, but you must remember that to send out petitions and print petitions, and to send to the different cheese factories and creameries of the United States, and to secure this kind of work behind congress that is necessary—that to do that—to pay postage, to pay printing—to do all this, calls for an outlay of money at the very start which amounts to a good deal. Let any man contemplate what it means, himself, and he will see. Now, then, our farmers are like other people. They are not so stingy as they are doubtful. If they could see, if they could keep track of that money, just where it is going, who is going to handle it, and all that—if they could be sure that it will be fairly and honestly used, I acquit them at this very moment of being derelict in the matter. They would be willing to contribute, but they do not know who is to handle the money, and whether it will be wisely and honestly handled or not. But every cheesemaker here knows whether he has confidence in the officership of that body or not. He could assure them that the men who are there are seeking nothing else but the promotion of the dairy interests, which should be patriotically in the heart of every man.

MR. DECKER.—We have this cheese before us,—a very fine Canadian cheese, that we have through the courtesy of Mr. Hoard, and we would like to know something about when the cheese was made, so that we may know the age of it.

MR. HOARD.—I think it is a last of August cheese. I am not quite certain, but that is my memory of it.

MR. DECKER.—Where was it made?

MR. HOARD.—Made in Eastern Ontario, in the Brockville district.

MR. DECKER.—Do you find as a general thing that the cheese in Canada run as this does?

MR. HOARD.—So far as I noticed. I will call the attention of the cheese-makers present here to the fact that this presents a wonderfully close, smooth, even body, without any indication whatever of gaseous action; that it breaks down very nicely, and shows texture and digestion, with pre-digestion, that

seems to approach perfection, and of good flavor. A good cheese. The discussions in Canada this winter have been intensely interesting. I wish they could have been listened to by our cheesemakers of Wisconsin, and I would suggest that you read the report of Mr. Crossley. You will find, those of you who read the "Dairyman," something said of . . . One of the most instructive things I ever listened to was the report of the secretary of their Western Association, Mr. Crossley. While in Canada Prof. Robertson was intending to be at this convention, but at the last moment was obliged to leave for Calvary and the Northwest Provinces in regard to some matters which had come up suddenly, requiring his presence. He expressed very sincere regret that he could not meet with the cheesemakers of Wisconsin in this convention, and desired me to explain to them what the circumstances were, and I wish on behalf of the officers of the association, as well, as himself, to make this explanation. He very much regretted that it was impossible for him to be here. I am certain we do.

The following officers were elected for the ensuing year:

President, ex-Gov. W. D. Hoard, Fort Atkinson, Wis.

Secretary, John W. Decker, Madison, Wis.

Treasurer, A. C. Van Elston, Muscoda, Wis.

Convention adjourned to 7:30 p. m.

Convention met pursuant to adjournment at 7:30. President Powell in the chair.

Mr. Hoard delivered the address of the evening. Upon his introduction by the chair, Mr. Hoard was greeted with the class and university yell by the students of the Dairy School, U. W.

MR. HOARD.—Boys, when you get out into the field, you will scare the cows away from the factories, if you make such a noise as that.

Mr. President, Gentlemen of the Convention, and Ladies also: I have no very clear and cogently arranged line of thought to present to you to-night, and I could wish that it was otherwise. A representative body like this is, dealing with one of the most important material interests of our state, one that takes hold, not only of its economic, but of its domestic character and happiness; one that lies under its progress; one which contributes to the state so important a part in the way of taxation and prosperity, should have the very best thought that any man could bring to it. I am deficient in this line of thinking tonight, I beg you to forgive me, and to attribute it to a very much crowded, a very much crowded condition of time. It was almost impossible for me to get away and come up here, and now I feel as though I would like to be deterred from going home, when once I get into the ranks.

What I have to say to you tonight will be somewhat along the line of my observations in the past three or four weeks in the country of our greatest rival. I went to Canada four weeks ago, under invitation from the three great leading associations of the Province of Ontario, and also from the Province of Quebec, but I was unable to fill any engagements in the latter province. I was very much interested and instructed, and I wished most seriously that I could have taken every Wisconsin cheesemaker with me into those conventions. I gave you as clear a report in "The Dairyman" as I possibly could, but it was but a short glimpse of what I saw and heard. Now, before I enter upon the analysis of this, I want to read you something drawn from Prof. Robertson's address, in which he appealed to the Canadians, and I want you to take it as an appeal to you. "We have very nearly," said Prof. Robertson, "reached the limit of cheese production in Canada." "We have very nearly," said one of the largest buyers, "reached the limit of cheese production." This testimony was agreed upon. The foreign market, for which all Canadian cheese is made, is about as nearly supplied as is safe for them to go. Now, what are they doing? They are turning this great stream of milk production into butter, and they have already quadrupled the amount of their butter export, and they are proposing to do that which I tried to get the Wisconsin dairymen to do fifteen years ago, and have never been able to since then; that is, to equip the cheese factory in such a manner as that they may make cheese from May to October or November, and butter

the ensuing portion of the year. This has already been adopted in Canada by about one hundred combined cheese factories and creameries, and they tell me that it will be adopted another year by from three to four hundred. In this way the finer and closer economies of the business will be worked out for the benefit of the patron. We must never lose sight of this great fact, that the man who holds the key to your growth in this business is the man who produces the milk. The man who opens or closes the door is the farmer on the farm, and he is the great objective question for you to consider. If the business is made profitable to him, then it will be profitable to you. In this business you stand in the same relation that the Persian courtier stood to his sovereign, when he said: "Honor be unto me as I honor thee." And, secondly, we must look constantly at this question of securing the largest profit to the producer, or patron—the farmer, the man who is really at the foundation of this whole question, and whose wealth becomes the wealth of the nation and the state. I find that there is closer thinking there, boys, than there is here. I find that those sturdy Canadians are doing finer thinking, finer managing, closer work, and that they are becoming correspondingly more potent and influential in the great market of the world than we are. Only a few years ago we were in a most fortunate state of affairs. I remember in 1884 having worked most steadily from 1872 to 1884 in correspondence with all the leading commission men and merchants in Bristol, and Glasgow, and Liverpool, and London, and had worked upon those people until they were sending here directly for millions of dollars' worth of cheese, and cheese was being made in Wisconsin and shipped directly to Liverpool, to England, in the various marts. I remember that Wisconsin was quoted upon the dairy boards of trade in Bristol, Glasgow, and Liverpool as at the very head. Now, had we been wise unto our salvation, had our people been endowed with true statesmanship, with sagacity, with that ability which takes hold of these great questions and sees the solution which lies at the end of them—had we been wise unto this salvation, we could have held the business to this day. It would have been impossible for any other country to have supplanted us. But we are not. We changed. In the first place we changed from our direct export market to the sea. We changed and gave the merchants of Chicago the handling of our business. Then we commenced making cheese for an uncertain kind of market, which had no clear, well-defined demand which would govern and tutor and educate the maker. Second, we commenced making skim cheese, and you know there are people who will hold a cent so close to their eyes that they can swear conscientiously that there is not a ten dollar gold piece behind, and we were so smitten with that idea of getting a little gain that we made large quantities of it, and the result was that we commenced to lose the market for our product, and had to mourn a defeat. We went from bad to worse, and we commenced making a counterfeit, a fraud, an imitation, a cheat, until 200 factories in Wisconsin were spoiling and destroying that which had been so earnestly, and so laboriously, and, I may say, so painfully, built up. Politics, that damnable poison which drops into the stream of business in thousands of instances and destroys its character and identity, came in among us, and it was because of that and other things that we found ourselves in this disgraceful situation. Now, my friends, we have commenced to clamber out of the slough of despond. We have commenced to do our best, and better, and we need to understand now that we have entered upon a different state of affairs than we ever saw before. We must do two or three things, and do them rightly, and do them well.

If we desire any export market at all for our cheese, we must make a cheese suitable for export, and make it right. I presented to you this afternoon one of the fine Canadian export cheeses. Did you see anything in it that would conflict with the home demand? No. Take that cheese into any town,—and I did so yesterday. I called several people into my office to sample the cheese. I said: "Here is a cheese made for the export market of England. Sample it." There was another cheese standing by its side. I brought two from Canada. Those men turned around and said to me: "I will give you 20 cents a pound for that cheese. Put it upon the market here, and in twenty minutes, if the people know it, you will have that cheese sold at 20 cents a pound." Now, the other cheese is begging passage in that town for 12, 13, and 14 cents, and people buy it under protest and say: "Lord, forgive us and our digestion for this sin we are committing." Now, it seems to me as though that practical common sense which

the American people are supposed to hold and possess should be exhibited in this question. I say to you that the demand in England is changing. It was the universal verdict throughout Canada in all of these conventions, that the people are coming to call for a richer cheese. Now understand—for a cheese which contains more fat and which will be of a more moist and of a better character, and in many particulars of different character,—less dry, less firm, less hard. Something like this cheese that you saw here this afternoon. Take that cheese, press it in your fingers. You saw how readily it broke off. It was made about the last of August. You saw, too, that it seemed to contain a higher per cent. of fat. You saw that it had been better predigested by the rennet. In many particulars it was different from what many have told you an export cheese was. Now, it seems to me that the native taste of our people is very much like that of the English people. A good cheese in England is a good cheese here. I know I sent to England—I have done so three times—sent to England and bought their prize English cheddar, imported it, and brought it to Ft. Atkinson, distributed it, and strove to educate myself as to what was wanted and what was deemed the best cheese, so that I might have a judgment, and every time that I would put that English cheddar before my own people in Ft. Atkinson, every time they would say: "That is a fine cheese. That is fine."

Now, somehow or other, we have drifted away from the demand. I want to read you these few figures, and show you how Prof. Robertson put the question to those people: "England last year imported of wheat and breadstuffs, 242 million (just think what mouths those people have over there—the best feeding people on the earth), of which Canada contributed only \$700,000. He says they imported 43 millions of animals, of which Canada sent 8 millions. Of dressed meats, 14,000,000, Canada sending only 4,600,000, mainly of cured bacon. Canada sent 14 millions, or more than half of England's importation of 22 millions of cheese." I saw the day when the United States was sending 15 millions, and Canada only 3. Now we are doing well if we send 5 millions of dollars' worth of cheese. England eats annually 22 million dollars' worth of cheese. In butter Canada sent only 500,000 of England's importation of 69 million. Now, just think what an opportunity there is here for the cheesemaker at home, and a wise, statesman-like policy on the part of government, to win this export market. He speaks of Canadian butter as being as good as any, but as it lost quality going across, it often commanded a third-rate price in England. I give you these figures to indicate the extent of the market, that you can all hope to compete for. Of condensed milk, England imported 5 millions, Canada not contributing a dollar. Poultry was another line to remember. England imported 3 millions in 1895; Canada sent 6,845. All these lines benefited by cold storage, and the Canadians are working along some very interesting lines now. England took 577 million dollars' worth of food-stuffs, and he says Canada gave only 40 million of that amount. Now, think of that! 577 million dollars' worth of food-stuffs.

Now, we, as dairymen, are very much interested in securing if possible some chance for outlet to this constantly growing milk supply. Remember that the cows in Wisconsin are increasing annually at the rate of about 5 per cent. Every year sees 5 per cent. more cows, and in 20 years they are doubled. Not only that, but under the pressure of constant education, constant thought and talk, the farmer is learning to develop the cow, so that I believe that the cows of Wisconsin today are producing milk and its resulting solids to the extent of nearly 100 per cent. over what it was fifteen years ago. Where will your occupation be, my brethren, pretty soon, if this business is crowded to the extent that there is no outlet? Now, what shall we do? Let me suggest two lines of work. First, the cheesemaker and the farmer are busy, must be busy, with the problem at the home end of the question. The statesman, the state, and intelligent, enlightened public sentiment should be busy with the commercial end of the question. Wisconsin ought today to rise to the dignity of her own position in this question. Wisconsin ought today to send an agent to the English market—the money of the state of Wisconsin should be employed to send an agent to the English market, empowered to study and investigate and report to the dairymen of the state of Wisconsin all necessary information, both technical and commercial. It ought also to do this: that agent should be there for the purpose of assisting and protecting shipments. What does Denmark do—little Denmark, shipping an immense quantity of butter into England, keeps an agent in London and Liverpool, so that

If a Danish shipment of butter appears on the wharf anywhere and is neglected for any length of time, that agent is there to see that Danish butter does not receive injury in transit which shall recoil back upon Danish reputation. These things the Danish government does. These things the Australian government does. These things the Canadian government is about to do, and we boastful Americans, bosses of the continent, are doing—what? Luxuriating in our supposed tremendous American independence. Yes, we are tremendous fellows, and a weaker set of fellows on God's green earth was never seen sometimes before the most evident duty.

Now, you can create public sentiment, and I appeal to you tonight to go home among your several cheese factories—Mr. Carswell said you represented 3,000 farmers. You represent 10,000 farmers; you represent more than 50,000 farmers in the influence, and the radiation of that influence, which may be had—go home to commence as factory-men with this proposition in your mind: Be governed by the law of surplus effort. What do I mean by that? If a lawyer enters into a lawsuit and measures his duty to his client by the amount of the fee he is to receive, it will not be long before that lawyer has less clients and smaller fees. If a doctor in attendance upon a patient cares no more for the life of that patient than simply the amount of his fee, it will not be long before that doctor has less patients and smaller fees. If a preacher serves his God and congregation with no larger measure of his duty than simply the amount of income he is to receive, it will not be long before he preaches to empty benches. If the cheesemaker, standing in between the people and their destiny has no sense of the law of surplus effort, is not a teacher, and cares nothing further for this question than simply the amount of his wages, that amount grows smaller and smaller every day, and when he would have the reward of larger effort, he has given no earnest for it. This question must obtain with you, boys, as it does with me in my work and with every other man. We must be schoolmasters and devote ourselves to a larger purpose. Let us be obedient to the law of surplus effort. Let every man put forth a little more effort than he is paid for doing, in order to receive more pay for something he is to do in the future. Now, I want the cheesemakers of Wisconsin to become imbued with this fact: that there must be a reform, and bona fide and quick reform of the cheesemaking industry of this state, and it must proceed from the cheese factory first. We must make better cheese, and we must do more than in our factory or associated effort. You are where you can do wonders. I know this to be true. I will pick you out a dozen men in this state that have transformed communities who were dull, stupid, and ignorant into communities of bright, intelligent farms on this question. How? Because the cheesemaker was a teacher. That cheesemaker had some understanding of the details of a farmer's work with his cows and his farm; had some understanding of what a cow is and how she should be treated and cared for; and he went into the farm, and he went everywhere, until he wrought up his patrons to better work. That you can do, and do it if you choose.

Now, we must do something in this particular at the factory end of the question. Then we must bring to bear our sentiment upon the legislative action of our state for a larger protection and a larger disposition of our goods. You have a political duty to do. I am not speaking of politics. I am not speaking of republicanism or democracy. I am speaking of politics in the larger sense; that is, a force must emanate from you, and the demand must go forth to the law-making forces of our state, saying to them: "Gentlemen, here is an interest worth twenty millions annually, bringing into this state an annual profit of twenty millions. You must do something for it. You must protect it. You must act intelligently in the disposition of this question, for if you do not, you will be held amenable by the sentiment of that state for the losses which shall come from your want of action." Now, I tell you you have a political duty to do with your people. I have no doubt today but what every cheesemaker here, if he should go before his patrons and say: "I want you to assist me in pressing upon the law-makers of Madison that something should be done in this line of securing more and better market facilities for Wisconsin products," that you would find every man behind you, signing a petition to that effect. Then let this question be adjusted into what is practicable, but let us first educate, educate.

How much would it cost to send an agent to Liverpool? How much would it cost? Supposing \$40,000 cows in this state, a cent apiece would be \$4,000, would it not, or would it be \$80,400? You quick in figures tell. You seem to be about as dull as I am. A cent apiece—nay, less than that would support a bright, sharp,

intelligent commercial agent in Liverpool, in England, to look after the pushing of Wisconsin goods. That would relieve the market. That would relieve the surplus. Then again, what would it cost to keep somebody there that would look after the butter market? Now here is a magnificent butter market. Remember that Mr. Robertson said here that England imports over forty millions of butter. We can put butter into England just as cheaply as any other people on earth. We need to look at the commercial end of this question, and not become purblind, with our eyes so close to the ground that we cannot see the destiny beyond us. And so I appeal to the boys who deal with the farmers to begin to stir that great mass of sentiment there that makes and unmakes legislatures, and in this I shall take only a minute or two longer. If I have in any way induced you to think upon this question from its commercial side, I will have done some good.

Now, Canada is introducing the cold storage system. Let me show you what the Canadian government does—the Dominion government. Lord Aberdeen, one of the aristocracy of England, and his gracious and accomplished lady, the Countess of Aberdeen, invited me two years ago to go with them into the provinces of New Brunswick, Prince Edward Island, and Nova Scotia. Did you ever hear of the president of the United States inviting anybody to attend a dairy meeting? No. But the representative of the Queen of England, Governor-general of Canada, takes so much interest in the foremost dairy industry in Canada that he invites a man from this side to go with him, and they held three monster dairy meetings in those provinces. At the recent three meetings held in the province of Ontario, the minister of agriculture, who corresponds to our secretary of agriculture, was in attendance at every one of those dairy meetings. Has anybody heard of Secretary Morton being in attendance on a state dairy meeting? No. And when we invited him a short time ago—asked Mr. Morton to send the chief of the dairy department, Mr. Alford, to Edgerton next week, we were met with a very ungracious refusal. Now, there is need of some sharp, intelligent thought to be put out by the people of Wisconsin and other states, with regard to what is necessary to be done for agriculture, and dairying is one of its most important branches. You cannot absolve yourselves from the fact that the outcome, the stream that flows away from your work, determines the possibilities of your future work. At every one of these three meetings, Minister Fisher had present other members of the cabinet, and Mr. John Dryden, minister of agriculture in the provincial government, was present also. I found there that the Dominion government has its hand right under this dairy industry; stands, with the keen Englishman's intelligence of what is best to do, stands there with liberal appropriations of money, establishing inspectors, doing everything for the instruction of the factory-men in the factory, and then everything to clear the channels of export and make that industry a solid, substantial industry in Canada. Now, to add to this, the Dominion government has taken hold of the Grand Trunk and the Canadian Pacific railroads, and has established a line of refrigerator cars, so that when the cheese is made it shall be put into a refrigerator car, clear to the farthest portion of the Dominion—way beyond Manitoba; Calgary, I think, is the western cheese country. When that cheese is put on board that refrigerator car, it is to be transported to Quebec or Montreal, or in cold storage proceed to England, for the Dominion government are not troubled with any of the scruples that our people are about paternalism in politics. They are not troubled with scruples about class legislation. But you know there is a heap of humbug and rot in that talk of class legislation. I remember when I went before the committee of Wisconsin men in Washington last winter, to plead for the passage of the filled cheese law, that a gentleman sprang up and asked me if this was not class legislation. I said: "Yes, sir, in this sense. It is legislation to put down a fraud, and to interfere with that class who are cheats and humbugs," and I said further that a "statute against frauds can never be denominated, fairly and squarely, class legislation in an offensive sense of the term. All we do is to appear before you here and ask you to show on which side you are. If you stand up for the limitation, and the humbug, and the fraud, and the cheat, gentlemen, we want you to range yourself on the proper side, and tell us where you are. Let the country know whether your sympathies are with the interest of the producer and the interest of the consumer, or whether you are with men who would humbug and destroy an industry like this one." Well, you

know, when you have called them out in that sort of way, and made them declare on which side they stand, that they are a good deal like the old judge in the protracted meeting. Judge Williams, of Williamsport, Pa., was one of the sweetest-hearted old men in the world, but he would get "tired," and when in that frame of body, he was correspondingly religious, always, and if there was a revival going on in the town, the judge was sure to be there, spiritually minded both ways, you see. The clergyman was setting forth his theme with splendid fervor, and said: "Show me the drunkard,—of all men on God's earth the most miserable. Show him to me." And unto the consternation of everybody the judge arose, and said: "That's me, sir." He was not afraid to stand up, you know, and be counted. I wanted congress to do that, and they did it. Not because I asked them to, but because the people asked. Well, the judge said: "That's me, sir, what will you have?" Well, the minister had realized on his investment so much sooner than he calculated, he had not provided any cold storage for it—did not know what to do, but finally they cooled him down—got him by the coat tails and pulled the old judge into his seat, and the minister proceeded with his sermon, and finally he said: "Show me the hypocrite, of all men the most to be despised—neither in harmony with himself, his God, or his fellow. Show me the hypocrite," and the judge arose a second time, and reaching his cane over to a certain shaky old deacon, he said: "Deacon, why don't you get up when you're called on? I did."

Now, I want to say to you that it is astonishing what power there is in public opinion, and when that sentiment was brought before congress, 40 millions of capital were behind the question of defeating that legislation, and yet, my brethren, that capital was powerless. There were lots and lots of ex-members of congress there as hired lobbyists. There were men there with the best of talent, politicians who care more for their own enlargement than they do for patriotism. There were men there in the employ of these corporations, but the people had said by thousands upon thousands of petitions, which we had provided through the National Dairy Union for being sent to them—they said to congress: "We want you to stand up when you are called on," and they stood up. Now, we can secure legislation in this way, and it is right and it is just it should be done. I believe that it would be one of the finest policies in the world for Wisconsin to enter upon, this very hour, taking hold of this great dairy industry and saying to the whole United States: "The state of Wisconsin, in its collective capacity,—legislature, governor, everything,—is behind this dairy industry to push it to its farthest extent and secure the finest market in the world for it." Now, we have got to look for this question somewhere. We have only about two million people, and we have nearly a million of cows. It is the boast of Holland that she has a cow to every inhabitant, and Jefferson county lacks only 300 of that. There are 36,300 people in Jefferson county, and 36,000 cows, and those cows have been a wonderful, wonderful purveyor of riches and wealth to that county, and today it is one of the richest agricultural communities to be found in the length and breadth of my travel. And, my friends, there are limits to this question. We are approaching a time when the economic consideration of this question will begin to bother us, and we ought to do something to increase and clear the channels of export, so that the industry of our people shall always have free course and be glorified.

Now, I have talked to along the line of generalization. I have not been specific in very much I have said. I have given you a hint as to what I find the statesmanship of the thing demands. I want you to go home to your respective duties and being there, every man, to work up public sentiment along this line, and I assure, if you do all in your power, the influence will be felt in the state.

Convention adjourned to meet at 9 a. m., next day.

MORNING SESSION, FRIDAY, FEB. 5.

President Powell in the chair.

CURING AND BOXING OF CHEESE.

Adolph Schoenman, Plane, Wis.

Before I read my paper, I wish to make a few remarks on the position that I am going to take, and the reason I take the position. You have all been here and heard Mr. Hoard make that one remark to which I call your attention, and that is, that the drift of the sentiment seems to be in favor of a cheese somewhat more moist and more buttery—a somewhat softer cheese than we have had heretofore, both in Canada and the United States. Any figures that I may give you I do not wish you to take as any boast that I am going to make of any work I have done. I want you in each instance to give the curing-room that I had to work with at least fifty per cent. of the credit.

As the principal feature of curing cheese is the curing-room and its construction, and as that appears as a separate topic on our program, I shall leave this important feature to be discussed under its proper heading. However, as the manner in which cheese is manufactured is so closely connected, and has such immediate relations with the curing of the same, I hope you will pardon me for somewhat digressing, at times, from the immediate subject assigned to me.

In starting out on the troubled sea of cheese-making at this day and age, when the market demands of a first-class cheese are so extremely critical, it becomes absolutely necessary, in order to meet the demands, to have at our command first-class curing facilities.

The object of this paper shall be an endeavor to show to this convention of cheesemakers, from actual experience and observations extending over many years, that the advantage derived from a first-class curing room is a very significant feature in the production of fancy and full cream cheese, and the curing facilities must be forced upon the cheese manufacturers, before they will be able to produce the cheese really wanted by the consumers of the same.

In starting out at the spring of the year, the cheesemaker should have in mind these three main features:

- 1st. A maximum weight of cheese from the constituents of the milk received.
- 2d. A first-class quality of cheese at all hazards.
- 3d. Caution—But not to obtain any weight at the expense of quality. I might add: But everlastingly endeavor to unite moisture with your other constituents of the cheese so as to both improve the quality and increase the quantity.

The cheesemaker should further bear in mind that the weight of the cheese is made up mainly of the following constituents in nearly equal parts, viz., casein, butter-fat, and water, the water costing nothing. Knowing this, he should bend all his energies toward the problem of how to incorporate and retain a maximum amount of moisture with the other constituents of the cheese, and at the same time improve the quality, and thoughtfully study this question, and it will soon dawn upon his thoughtful mind that it is the hot, dry curing room that forces him to cook and salt high, making a cheese stiff, dry, and corky, and in figuring of the amount of moisture and quality that is lacking in his cheese, he will perhaps become utterly disgusted with hot, dry curing rooms, and will become one of our number to advocate better curing rooms.

I think I can safely say that at this stage of the cheese industry in the state of Wisconsin the most imperative demand of any one thing to improve the quality and increase the quantity, per hundred weight of milk, of our cheese, is: to have an entire revolution in cheese-curing facilities.

There was a time, not many years ago, when the general impression was among makers that if cheese were only real firm, the firmer the better, it was all right, and thus was acquired the false notion of high cooking and high salting.

Cheese-buyers now tell us that such cheese, often termed "stiff," is not considered a fancy cheese and cannot be used at top quotations. The term "stiff" is no doubt derived from the fact that in drawing the finger across the rind, the feeling is very hard or stiff—no elasticity or velvety feeling. The plug, when drawn, is tough and dry as a chip. I do not believe that our makers are alto-

gether to blame for drifting into the habit of making such a cheese. The fact of the matter is, they are compelled to make a cheese to suit the wants of a hot, dry curing room, and are forced to disregard the wants of the cheese-consuming public, of this or any other country. The cheese that we all want, and are craving for, is a cheese which has an elastic touch, a velvety feeling, with a rich, nutty flavor, melting under the tongue, and with a desire for more of the same kind lingering in the thoughts of the consumer.

But be it remembered that a cheese of this quality cannot be made short of a curing room where the temperature and moisture can be controlled at the pleasure of the cheesemaker.

The question then is, shall we continue in the same old rut making cheese to agree with the wants of second-class curing rooms, and disregard the wants of the consumer, or shall we revolutionize our curing facilities and cater to the wants of our customers? A temperature of from 60 to 65 degrees Fahrenheit, with a moisture, as shown by the hygrometer, of from 70 to 90 per cent. This is what we must have. A proper amount of moisture put into the cheese and retained there during the process of curing, I believe, is the key to fancy cheese-making.

In regard to the length of time a cheese should be kept in the curing room under the eye of the cheesemaker, according to Dr. Russell's "Rise and Fall of Bacteria in Cheddar Cheese," as given in the thirteenth annual report of the Wisconsin Experimental Station, and also as advocated by our best cheesemakers, cheese should be held in the curing room at least thirty days, with one possible exception, of which I wish to caution you all.

There is a time in the spring when the decline of cheese is sure to come, and it is during that critical period when unprincipled makers and salesmen do our cheese industry much harm by scrambling to rush their cheese upon the market, often almost from the hoop, and thus burden our markets with a lot of undesirable goods, thereby glutting the avenues of our cheese trade.

I appeal to every cheesemaker within the hearing of my voice not to allow himself to ruthlessly disregard all principles of cheese curing during that critical period, but to stand firm by at least reasonable rules laid down for making and curing a quick curing cheese, and not overstep their bounds.

I will give what I consider safe rules for quick curing cheese: $4\frac{1}{2}$ oz. Hansen's standard rennet per 1,000 lbs. milk; $1\frac{1}{4}$ lbs. good dairy salt; temperature in curing room, 65 to 70 degrees F.; moisture, 70 to 90%; cheese to be held on shelves at least from 12 to 20 days.

My proofs of what I advocate here today are pretty strong; as the saying goes, "the proof of the pudding is in the eating of it." Under proof No. 1, I will give the comparative figures of two factories located about one mile apart, quality and condition of milk delivered to the same as nearly equal as two factories possibly could be, in proof of which I cite you our present cheese instructor Baer, who visited both factories twice during the season of 1896.

In factory No. 1 the cheese were cured in a temperature of 60 to 70 degrees F.; moisture 70 to 90%. In factory No. 2 the cheese were cured in an ordinary, well-made curing room, kept as cool as the weather would permit, and without regard to moisture.

The table on page 42 contains figures showing weights of cheese per cwt. of milk, and the prices received in each factory, as per secretary's report—in this instance the same person being secretary of both factories:

Proof No. 2 I believe is fully as convincing. I saved cheese from nearly every month of the season, eight in number, kept them in my cellar curing room, and on shelves at least 60 days, after which they were boxed, and on Jan. 14, 1897, shipped them to Chicago to be judged by two experts. The average score of those cheeses was far beyond my expectations. The flavor was marked perfect on every cheese by both persons scoring them; color was marked perfect on all cheeses but one, on both score-cards; texture was marked perfect on four cheese, on both score-cards; on the other four cheeses texture was marked 28 for three cheeses and 29 for one cheese, by one of the judges. The other score-card giving 29 on texture for the four poorer cheese, 30 being perfect. Stating further, they say: "In our judgment they are as fine a lot of samples as we have ever seen, considering their age, and we can hardly see where they can be improved upon."

While being employed as instructor in dairying for the state of Washington, I made a lot of cheeses during the last two weeks before the close of the term.

MONTH.	FACTORY No. 1.			FACTORY No. 2.			Milk received factory No. 1.	Gain No. 1 over No. 2.
	<i>Secretary's Report.</i>			<i>Secretary's Report.</i>				
	lbs. cheese per 100 lbs. milk.	Price sold.	Rec'd per 100 lbs. milk.	lbs. cheese per 100 lbs. milk.	Price sold.	Rec'd per 100 lbs. milk.		
May.....	9.02	7.00c	\$.6314	8 3	6.77c	\$.5919	128,500	\$90 00
June.....	9.00	7.00	.63	8.4	6.58	.5527	190,000	146 87
July.....	8.85	6.5	.5752	8.4	6.12	.5140	184,000	112 60
August.....	9.05	7.34	.6643	8.85	7.1	.6283	220,000	79 20
September.....	9.95	8.41	.8368	9.86	8.16	.8045	215,000	69 80
October.....	10.5	8.75	.9188	10.6	8.5	.9010	180,000	32 04
November.....	10.75	8.5	.9138	10.6	8.02	.8501	97,000	57 33
							1,207,500	\$587 84

Our curing room was a basement curing room, with abundance of moisture and perfect temperature. Accordingly I made a cheese with a fair amount of moisture, with instructions to Mr. Spillman to cure according to directions for at least 40 days. Sometime in June I received a letter from Prof. Spillman stating that the cheese sold like hot cakes for 14 and 15 cents per pound.

I cannot remember the exact figures, and further he said that he could sell tons and tons of the same kind at the same price, if he only had them. This letter came to me without asking about the cheese, so then I wrote him a letter and asked him whether the cheeses were really fine, and this is the second letter I got from him regarding the cheese.

In regard to boxing cheese, the maker should always order the best boxes obtainable at any price, and one-half inch larger than the cheese; for example, a 14½ inch cheese needs a 15 inch box, and when hooping for the curd, it should be weighed, which will enable the maker to get the size of the cheese in height, so as to exactly fit the box, and thus avoid a large amount of waste and labor in cutting down boxes.

I have often wondered how little business sense many cheesemakers show by making cheese by guess, and then, when boxing day comes, work half the night cutting down boxes to fit a miscellaneous lot of cheeses weighing all the way from 58 to 65 lbs. Their unbusiness-like way of doing business crops out in three different directions: 1st. Waste in boxes. 2d. Extra work in cutting them down. 3d. Last but not least, a lot of cheeses not very desirable by fancy cheese dealers. Oh! How simple and easy and business-like it would be to weigh the curd and get a lot of cheeses uniform in size, calculated to fill the box exactly to one-eighth inch above the top of the box. If this is not done, all boxes should be cut down one-eighth inch below the top of the cheese, to prevent the top rind of the cheese from drying out and checking open, while under transit.

Cheddar cheese should have double scale boards both on top and bottom, while twin cheese should have double top and bottom and three in center.

Experiments made at our Experiment Station have proven that cheese cure best in the open air, that is, open on the shelves, with free access to the pure air. Makers should therefore avoid boxing cheese until cured and ready to ship.

Patrons ordered to haul cheese should be instructed to appear early in the morning with a clean double box on wagon, filled with clean straw or hay, and an abundance of blankets to cover the cheese while under transit to the station.

In concluding this paper I would like to impress one more very important idea upon the boys, and that is that a genuine feminine cleanliness and order should reign in their curing room, as well as in all other rooms under their care, with an abundance of ventilation so arranged as to avoid direct drafts across the cheese. Pure, wholesome air is as necessary in curing cheese as in curing the sick when under the doctor's care and commands.

MR. POWELL.—Gentlemen, you have heard Mr. Schoenman's paper. Now, be loaded. You can get lots of information out of him, if you will only put him lots of questions. Let us hear from somebody who wants information from him. He is on the stand now.

MR. ADERHOLD.—Mr. Schoenman, do you know what was the difference in the shrinkage in weight of those cheeses in the two factories?

MR. SCHOENMAN.—No, sir. I do not.

MR. FAVILLE.—Mr. Schoenman has given us a heap of information in his paper, and I believe has more of it back. So I hope the boys will fire into him. I am very glad of one thing—while I am on my feet, I want to say this—I am very glad of the strong emphasis that he puts on the curing room. My experience corroborates his experience fully. I have said many times, and years ago, that the best manufactured cheese could be totally ruined by a bad curing room, and I still believe it, and I am very glad to hear the young man corroborate my statement and belief that that is so. I used to be in the business—used to make cheese first, and then for a number of years was a cheese dealer. I knew almost every curing room in southern Wisconsin, and central, too—what was then northern. That was ten or fifteen years ago, and there was not a good curing room in the whole circuit. I do not know what there is now, but I have reason to believe that they are not all good yet. I am very glad to hear this point emphasized.

I noticed one other thing in the paper—that the temperature he gives for the curing does not quite agree with our Experiment Station in Madison. I am glad to hear that, because I have had a good many controversies with the fellows up there. Their temperature is too low, especially for the first few days, when the cheese is green. It wants a higher temperature than it does later on. A temperature that would be right for a cheese 30 days old would ruin it in the first ten days. I have lost dollars and dollars in learning that, too. You have often heard that one swallow does not make a summer, and one experiment does not settle a thing, and I have in my experience lost good money by curing cheese at too low a temperature.

MR. MONRAD.—Before we start this discussion, let us get an understanding of what you mean when you say that the demand is for a soft, rich cheese. Soft—I will lay stress on that word. Does that cheese that Gov. Hoard showed us from Canada yesterday come within your judgment of the demand that you are standing for? Let us get an idea of what you mean.

MR. SCHOENMAN.—I would say in regard to that that the cheese I have in mind, if they were as I advocate, would be somewhat more moist than the cheese we had yesterday. You see, the gain is very large when you come to figure in a large factory. If a man can gain half a pound in weight, it is just as well as to gain half a pound in price, if you can do it without losing quality.

Q. I would ask the gentleman how he ventilated his curing room.

MR. SCHOENMAN.—I do not claim that I have a perfect curing room. The ventilation was not perfect. I do not claim it was, but I had good results. The cellar was just a common cellar, and there was a small window on each side of the cellar, and there was a door from the outside. That was the only ventilation I had. I would open those up at night, and be careful not to have any draught on the cheese. In very hot days I would close it up.

MR. ADERHOLD.—How deep was the floor of your basement below the ground?

MR. SCHOENMAN.—I should judge about seven feet, and about one and a half foot above the ground. There was a solid wall. It was just an ordinary house cellar, with cement floor.

MR. MONRAD.—How were the walls built?

MR. SCHOENMAN.—Wall of solid masonry—not perfectly smooth like this plaster. It was cemented on the bottom, but not on the side.

MR. ADERHOLD.—Were you ever troubled with the cheese moulding?

MR. SCHOENMAN.—No, not what I considered bad mold. I had some white mold on the cheese, but I am not afraid of white mold, if I do not get the green or black mold.

MR. MASON.—We have so many bad curing rooms in the state, I should like to hear a discussion of curing rooms that are bad. My factory is pretty well secured against heat, unless it should be warmer than it was last year. I pro-

pose in this factory to place two tubs of water in the curing room, one on each side, and a ventilator in the center of the curing room, and have a draught come in over this water and go up through the ventilator in the center of the building. I do not know whether I am right, but that is an idea I had.

MR. POWELL.—In regard to the construction of curing rooms, our next paper will cover that.

MR. ADAMS.—Will not direct air on the cheese, Mr. Schoenman, check it?

MR. SCHOENMAN.—You want to avoid direct draught.

Q. I would like to ask Mr. Schoenman how he can have the cheese uniform from day to day when his milk is apt to vary in quality, and also the amount of rennet to use in a fast curing cheese. He omitted to say how many seconds he would ripen his milk in that time?

MR. SCHOENMAN.—Of course, I was not on for making cheese, but I think I can give you the information. I cannot give you any set rules, because the action is too close, but I would say in this connection, the maker will have an abundance of common-sense. When he makes cheese, he will have to have some skill. I do not mean to give you a set rule. I only give you this in a very general way. I have heard of cheesemakers using 5 or 6 pounds all summer. I think it is a waste of money. I would never do it. When you are making a quick curing cheese, you want to ripen your milk down a little closer than when you make a keeper.

MR. BAER.—Would the temperature of the curing room depend a good deal on the kind of cheese you are making? When you are making a soft cheese, or when you had milk that was working fast—that was almost acid—do you not think a higher temperature for the first ten days would be better?

MR. SCHOENMAN.—I will tell you, there is one thing that I did this summer, and I like it very much; that is, I had two curing rooms. I had my regular curing room and this cellar curing room. I was perfectly willing to keep my cheese at a high temperature for a few days. When it gets 6 or 8 days old, you must have a cooler temperature. In regard to the firm cheese or soft cheese, I want to caution the boys a little on this soft cheese business—not to attempt it unless they have a good curing room. We must have those curing facilities first, and then we can make those cheeses that the people want.

MR. ADERHOLD.—What was the temperature of your curing room in the basement?

MR. SCHOENMAN.—From 60 to 70. Hardly ever above 70.

MR. ADERHOLD.—Would you then have to keep those cheeses in the other curing room?

MR. SCHOENMAN.—Yes, really for room, I had to do it. It just suited me all right. I think it ought to be done.

MR. ADERHOLD.—It is merely theory with you, is it not? You have not taken some of the same vats of cheese and cured parts of them in one curing room and put the other in the basement, the first thing—you have not tried that, have you?

MR. SCHOENMAN.—No, I have not. Have you?

MR. ADERHOLD.—I have not. When I had to use the basement I used to put them down there first thing.

MR. SCHOENMAN.—I should say the other curing room is not a poor curing room. Unless it gets very hot I can cure cheese there all summer, and in the spring of the year, and in the fall, I cure them in my regular curing room, and to keep the moisture I sprinkle the walls and the floor. I think that moisture has a good deal to do with cheese making.

MR. JOHNSON.—Can you keep 90 per cent of moisture in your cheese and keep them from molding? Some buyers will not take cheese that has molded, and there are others that object to it. I keep between 70 and 80 per cent. moisture in my room, and the cheese would mold on me in spite of all I could do. I had it pretty well ventilated, too.

MR. SCHOENMAN.—Well, that may differ in different curing rooms. I think a cellar curing room would do better, on account of the cold air coming through there at all times during the hot day. Hot air coming in may produce a different effect than it would in a cool cellar. I had no trouble. I had 70 to 90. I would always watch the moisture between those figures. I had white mold on my cheese, but I did not mind that. I do not think it is dangerous.

MR. CARSWELL.—In regard to the remark of Mr. Schoenman about cold air coming directly into a warm room, that air will expand, and if it is in a room holding a large amount of moisture, the immediate contraction of the atmosphere when it enters a cold room precipitates a small amount of moisture on the outside of the cheese, giving a damp surface. It is not through a damp atmosphere; it is water on the cheese in minute particles, and if you put your hands about the greased surfaces, in extreme cases, it will feel damp. But there are few such cases where I have had mold.

MR. MONRAD.—When the outside temperature was 90 or 95, could you keep your temperature down to 70? That must have been an exceedingly good cellar.

MR. SCHOENMAN.—Well, I will say that it might have been two or three days in the very hottest weather that it perhaps went 72. I do not think it ever went 75.

MR. MONRAD.—How did you manage your ventilation?

MR. SCHOENMAN.—I kept it closed in the hottest days, and open in the evening.

MR. AUSTIN.—How is the factory situated—on high or low ground?

MR. SCHOENMAN.—I told Mr. Aderhold that the cellar was about 7 feet below the ground. It is on high land, clayey soil.

MR. FAVILLE.—It is not the butter that is in the cheese that keeps it soft, but it is the water that you keep it with. The best cheese that we can get today is about 37 per cent. water—37 out of a hundred, or 35. And you must cure the cheese to keep that water in it, and manufacture it so that it keeps there. Butter will not keep the cheese soft. They say if it is hard it is skimmed, but it is not certain at all. It is the water, and in order to keep water in you have to cure it at rather a low temperature. They speak about taking cheese into the drying room. Well, drying the cheese and curing it are two different things entirely. One is the evaporation of moisture, and the other is the action of the rennet—or the bacteria. We do not have rennet any more. It is bacteria. It is giving them a chance to work. That is the difference. And those bacteria want to be placed at a temperature where they can work. They work all the better in a damp atmosphere. They may dry up if it is too dry. Give them the proper conditions, and they will make us a good cheese—if you will start it right.

MR. ADERHOLD.—I would like to ask Mr. Schoenman how much salt he would use in this moist cheese of his, and whether it would not be possible to increase the yield of cheese, and still have a good quality by giving it still more moisture and using more salt so that the cheese will be fair keepers?

MR. SCHOENMAN.—We used about 2½ pounds of salt. I never made any experiments in that direction, but my opinion is that it would perhaps work all right. It would make a better keeper.

MR. FAVILLE.—Referring to that paper of yours, how is it you sent cheese of each month's make to Chicago?

MR. SCHOENMAN.—I picked them out.

MR. FAVILLE.—Was the score-card on that cheese for a perfect cheese or a perfect cheese of that date? Was the score-card perfect for the six months' old cheese?

MR. SCHOENMAN.—I told them the age of the cheese, and at the end they said: "For the age of the cheese they are perfect."

MR. FAVILLE.—I did not know whether it was a perfect cheese as we would score it now, for a September or October cheese, or one that had been made earlier,—whether a June cheese would be as toothsome today as an October cheese. That is what I wanted to know.

MR. MONRAD.—I am shocked at Uncle Faville. Here is my old friend, Uncle Faville, wanting to get these men into substituting water for fat. I am shocked! To say that we should cheat the public and make them believe that they get a rich cheese by putting in more water. Well, gentlemen, this is no joke. I want to enter a warning, and a serious warning, against the tendency as shown by this gentleman's paper—against this tendency, as he shows by his figures, of gain in yield. As surely as we have been going too far in making big yields of butter by increasing the percentage of water, just as surely we are running into danger if we try to increase the moisture too much in our cheese. That was what I wanted to bring up—the difference between Mr. Schoenman's, or rather the American, idea of cheese and that of our friends across the boundary, as exem-

plified by the cheese shown you yesterday. When in Denmark I learned to make skim cheese. I learned that trick of putting in water instead of fat. That is one of the secrets of making good skim-milk cheese—to fool the public by putting in more water. It is water plus fat, the two things combined, that gives good quality. Now, there is really a danger. It is one thing to keep your moisture in the cheese right and another thing to get it watery. I had a sample of a very good cheese, but there was too much water in it, and I think the flavor suffered by it. I want to enter a serious warning against going too far in that way.

MR. FAVILLE.—Put all the butter in it that you can, and you can reinforce it, but if you allow the water to get out, your cheese will be hard.

MR. MASON.—I want to ask Mr. Schoenman if there is really any danger of getting too much moisture in the cheese in the common run of curing rooms that we have in this state.

MR. SCHOENMAN.—There is a serious danger if a person makes a somewhat soft cheese; unless he first changes his curing room, he is in a very bad position, and may get left.

MR. FAVILLE.—In what way?

MR. SCHOENMAN.—Because those moist cheeses and somewhat softer will not stand the heat.

MR. SPOONER.—There was something there I did not understand. The way I understand that paper, it took less milk to make a pound of cheese in Mr. Schoenman's factory in June than it did in October.

MR. SCHOENMAN.—That is per 100 pounds. We figure per hundreds of milk. It was 9 in June, and that given in October about 10 $\frac{1}{4}$ per 100 pounds.

MR. ADERHOLD.—I would ask the gentleman what he thinks of the common cheese box. Is it as strong as it ought to be?

MR. SCHOENMAN.—I think not. I think that all the cheese boxes, or nearly all, are not strong enough. You can tell that by going down to Chicago on South Water street.

MR. POWELL.—Mr. Schoenman says that where the makers did not weigh their curd and get their cheese of uniform size, they spent half the night cutting down the boxes. They do not do it. I had a little experience last summer in Milwaukee, and nine boxes out of ten came into Milwaukee without the boxes cut down, and it is the same in Chicago. I have seen cheese come in where the box was two inches larger than the cheese, and half of those boxes were broken so they had to be replaced with new boxes. If a man does not cut down his cheese boxes, he has no kick coming if the buyer charges him up with new boxes, because if the cheese is not one-eighth of an inch higher than the box, the whole weight of the cheese on top is on the box, while it should rest on the cheese. Where the cheeses are piled 8 or 10 high, the boxes are not strong enough to hold them, and if the cover does not rest on the cheese, they will not hold out, and they will be all broken to pieces. Never let your cheese go out of your factory unless the box is cut down to the cheese. And if a lot of cheese comes in with the boxes all broken to pieces, I have known a man to take half a day to fix them up in shape to sell.

MR. SPOONER.—I think 4 $\frac{1}{2}$ oz. of rennet to a 1,000 is a good deal.

MR. SCHOENMAN.—I do not think it is too much for a quick curing cheese, in the spring, when you know that the cheese will be eaten in about thirty days. Generally in the spring you will know that the cheese which you make will be sold in a short time, and then it will be sufficient.

MR. SPOONER.—Do you think it will ripen any quicker?

MR. SCHOENMAN.—I do.

MR. SPOONER.—Why?

MR. SCHOENMAN.—Because experiments have proven it.

MR. SPOONER.—Did you get any acid in them?

MR. SCHOENMAN.—Yes, sir.

MR. SPOONER.—I do not understand how you cured that cheese with 4 oz. of rennet. How much salt did you use?

MR. SCHOENMAN.—I use as low as 1 $\frac{3}{4}$ pounds early in the spring.

MR. SPOONER.—You say that cheese was ready to ship in from 12 to 20 days?

MR. SCHOENMAN.—Yes, sir. Pretty fast work, but not near as fast as some.

MR. SPOONER.—Was it the quantity of the salt that made it cure so quick?

MR. SCHOENMAN.—Yes, sir, partly.

MR. ADERHOLD.—Do you not think the salt had a great deal more to do with it than the rennet?

MR. SCHOENMAN.—I do, but I think the rennet has something to do with it.

MR. ADERHOLD.—I think $\frac{1}{4}$ pound of salt has more effect on the curing part than an ounce of rennet.

MR. SCHOENMAN.—I do, too. I think that would be about the rate.

MR. SPOONER.—I do not believe from my experience that a large quantity of rennet has anything to do with the curing of cheese.

HOW TO CONSTRUCT A CURING ROOM TO MAINTAIN EQUAL TEMPERATURES.

Prof. F. H. King, Madison, Wis.

In 1893, I was requested to read a paper upon this subject before this same organization, and in that paper I stated by way of introduction that to discuss the subject assigned to me in explicit terms there were several questions which must first receive definite answers, for they have extremely fundamental bearings on the construction of the curing room.

1. At what mean temperature should a curing room be held, and how great departures from this mean temperature are admissible?

2. Is sunlight an essential factor in the curing of cheese or may this agent be wholly or largely excluded?

3. Can the curing of cheese go forward properly in a still air or must good ventilation be provided?

4. Is it important that the air in a curing room should be held at a certain degree of humidity or moisture, and if so, what is the right degree?

5. Are there stages or times in the curing of cheese when the temperature, light and moisture should be maintained steadily at some higher or lower degree than is required at another stage?

It appears that there are, even now, no very definite answers which can be set down for these questions and hence I am again forced to assume conditions.

As practical experience seems to point to a moderately dry air at 65° F. for the beginning stage of curing for cheddar cheese; and to a warm moist air at 60° F. for the finishing requirements I will confine this discussion to these two phases of the problem.

How may we construct two curing rooms, one whose temperature may be held at 65° F. and humidity at 60; and the other whose temperature shall be 60° and whose humidity shall be 70°?

To understand the essential features of this problem it is important to know the meteorological conditions which must surround our curing rooms. The following table gives some of these:

	Mean Temper- ature.	Mean Rel. Humid- ity.	Dew Point.
May	57	74	49
June	67	83	61
July	76	77	69
August	69	81	63
September	61	83	56

These figures are more strictly applicable to Madison than to other parts of the state, but they are approximately true for a large part of Wisconsin and will answer the purpose of this paper.

It will be seen that during the months of May and September the natural air conditions are about what seem to be desired for cheddar cheese, but for June, July and August the temperatures are too high.

Now since the mean temperatures of the air are too high it is evident that in order to secure a temperature of 60 to 65 degrees for the curing room some method of cooling the air must be adopted during the three summer months at least.

THE USE OF SUB-EARTH DUCTS AND CELLARS.

Several efforts have been made to use sub-earth ducts as a means of cooling the air to the desired temperature before admitting it to the curing room.

In my previous paper I stated that in April the mean temperature of the ground at 18 in. below the surface is, with us, about 48 degrees and at 6 feet not far from 40 degrees, but in August the mean temperature at 18 in. will reach nearly 70 degrees and at 6 feet not far from 65 degrees. These being the facts neither sub-cellars nor sub-earth ducts can be expected to maintain a temperature of 60 degrees unaided by some cooling device.

In the magnetic observatory sub-cellar which was used last summer by the Experiment Station as a curing room for cheese a temperature as high as 65 degrees was reached quite early in the summer, and yet this cellar has been constructed with more than ordinary care for the express purpose of avoiding, among other things, changes of temperature.

So far as temperatures are concerned then the best that can be hoped for from July to September from sub-cellars and sub-earth ducts is the maintenance of a range from 63 to 68 degrees F. in Wisconsin.

HOW SUB-CELLARS AND SUB-DUCTS INFLUENCE THE MOISTURE OF THE AIR.

Referring to the table just given it will be seen that the mean dew point of the air is 61 degrees in June, 69 degrees in July and 63 degrees in August. This means that if the outside air is introduced to a curing room cooled down to the temperature of the dew point, that is to 61 degrees in June, 69 degrees in July and 63 degrees in August, this air will be completely saturated with moisture and too damp. In other words such air will cause the cheese to mould and even decay. This is the most serious objection to sub-earth ducts and to sub-cellars when used alone and unaided by other means.

It should be emphasized here that the moisture in the air of these curing rooms comes neither from the walls of the ducts through which the air is led nor from the walls of the cellar. The air would be just as damp if the walls of the ducts and of the cellar are lined with metal through which no moisture could penetrate.

It should be kept in mind that to render any air saturated with moisture you have only to lower its temperature a sufficient amount.

Now if you wish 60 degrees in the curing room the June air will begin to deposit moisture on objects in the curing room as soon as it reaches a temperature of 61 degrees, or one degree above the desired temperature; the July air will begin to deposit 9 degrees above the desired point and the August air 3 degrees above.

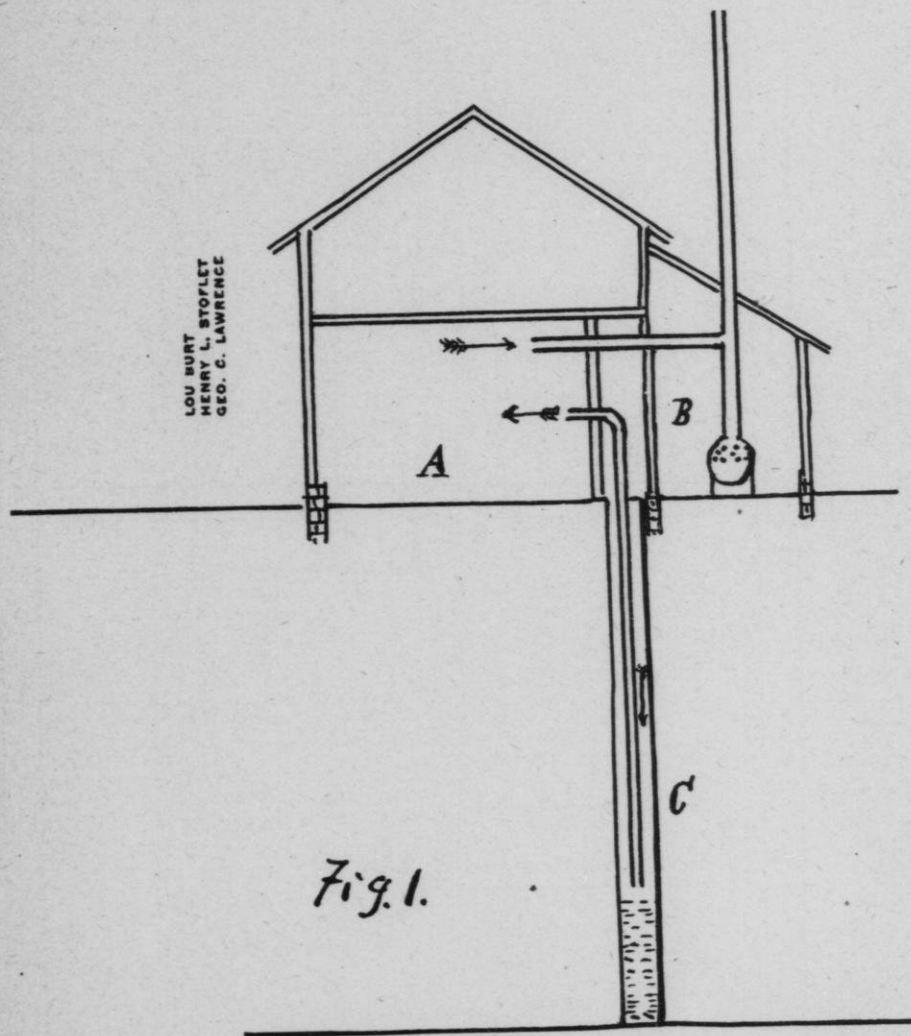
HOW TO SECURE A TEMPERATURE OF 60 DEGREES AND A HUMIDITY OF 70 DEGREES IN JUNE, JULY AND AUGUST.

If it is found necessary to hold the temperature of the curing room at 60 degrees during the months of June, July and August then in order to have a relative humidity of 70 degrees it becomes necessary to adopt some method of drying the air so as to lower its dew point to 50 degrees.

This drying may be accomplished in two ways:

1. By using either in the curing room or in the supply duct, some drier such as quicklime or calcium chloride, which has the power of withdrawing from the air the moisture it contains.

2. By using some method of cooling the air down to 50 degrees F. before it enters the curing room, if a relative humidity of 70 degrees is desired and to 52 degrees if a humidity of 75 degrees is desired. The principle involved here is this: If we cool air to 50 degrees we remove from it in the form of dew all the moisture it is not able to hold at that temperature, and if air so cooled is allowed to enter the curing room and have its temperature raised to 60 degrees its relative humidity will be lowered from 100 degrees to 70 degrees. On the other hand, if we cool the air down to 52 degrees, and it becomes saturated at that temperature, on raising its temperature to 60 degrees its relative humidity will become 75 degrees, or 5 degrees more moist than in the other case.



LOU BURT
HENRY L. STOFLET
GEO. C. LAWRENCE

Fig. 1.

FIG. 1.—Showing how deep open well may be used to cool curing room. A is curing room. B is boiler room where ventilator from curing room opens into smoke flue of engine. C is well with 10 inch galvanized iron pipe taking air from well to curing room.

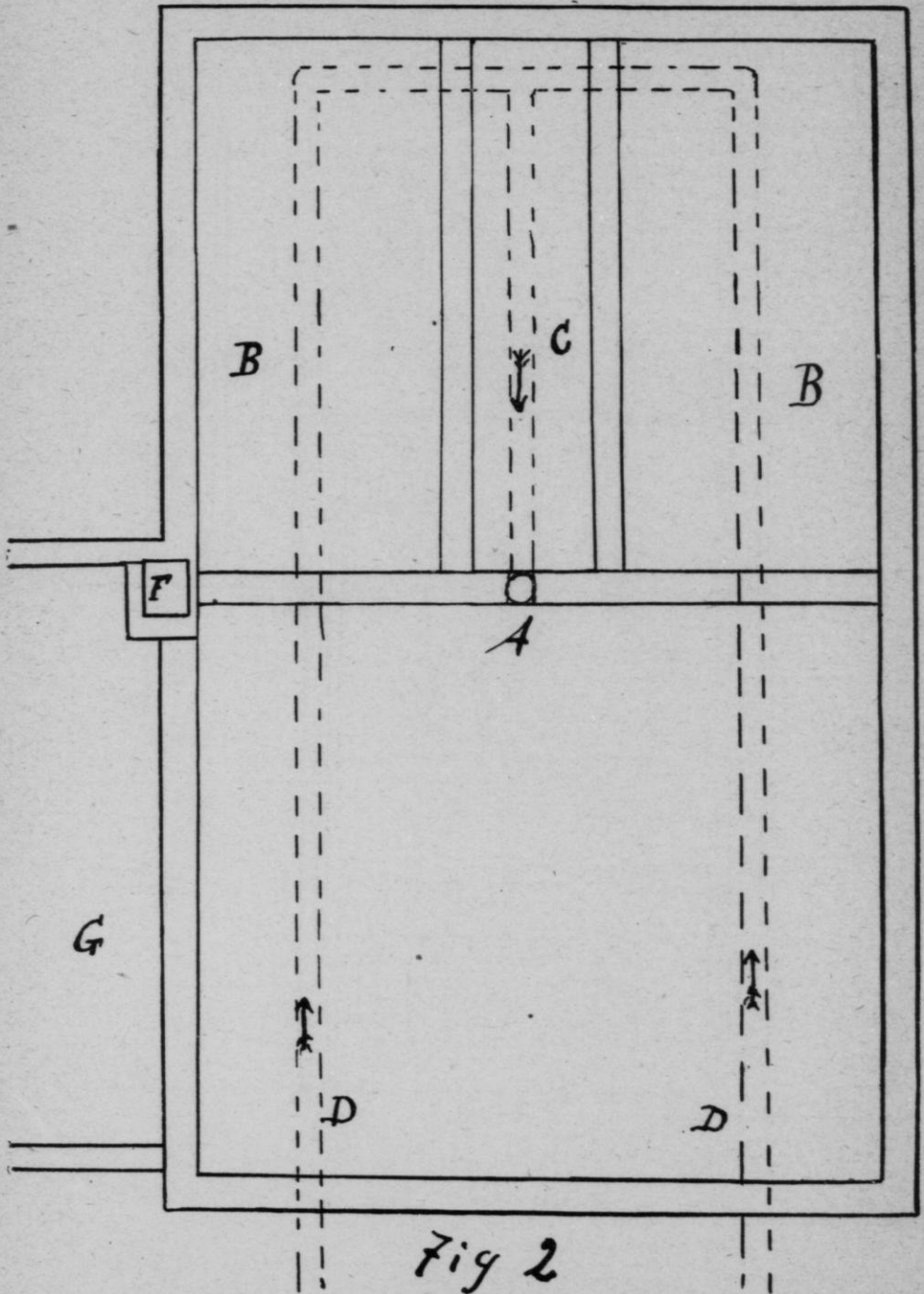


Fig 2

FIG. 2.—Shows sub-earth ducts leading under basement floor to curing room. A is where air rises into ice chamber. D, D, C are 12-inch sewer or drain tile three or four feet below basement floor for sub-earth ducts. B, B are curing rooms. F is chimney and ventilating shaft. G is boiler room.

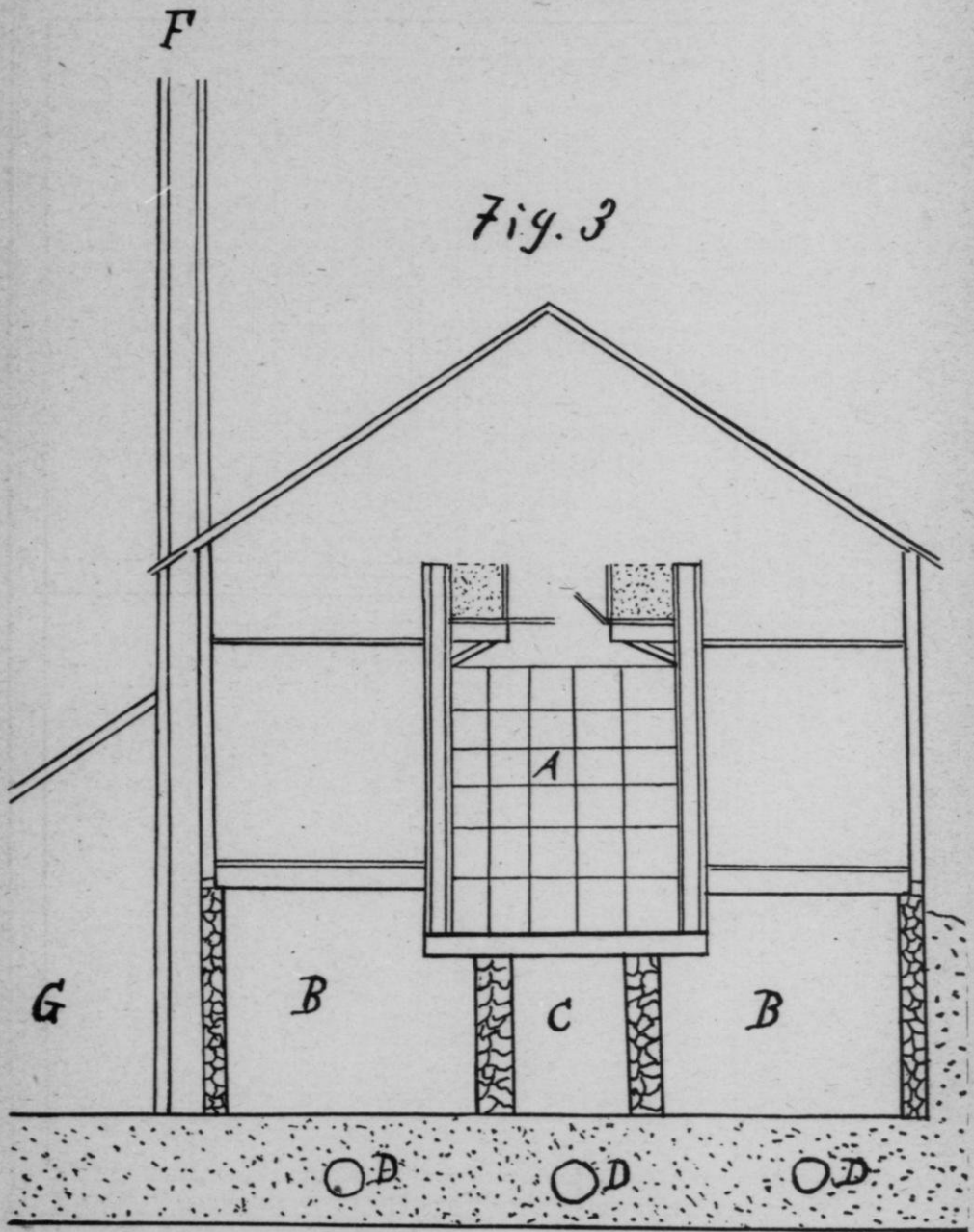


FIG. 3.—Shows section of curing room and ice chamber. A is ice chamber. B, B are curing rooms into which cold air from ice chamber falls. C is either cold storage or curing room as desired. D, D, D are sub-earth ducts described in figure 2. F is chimney and ventilating flue. G is boiler room.

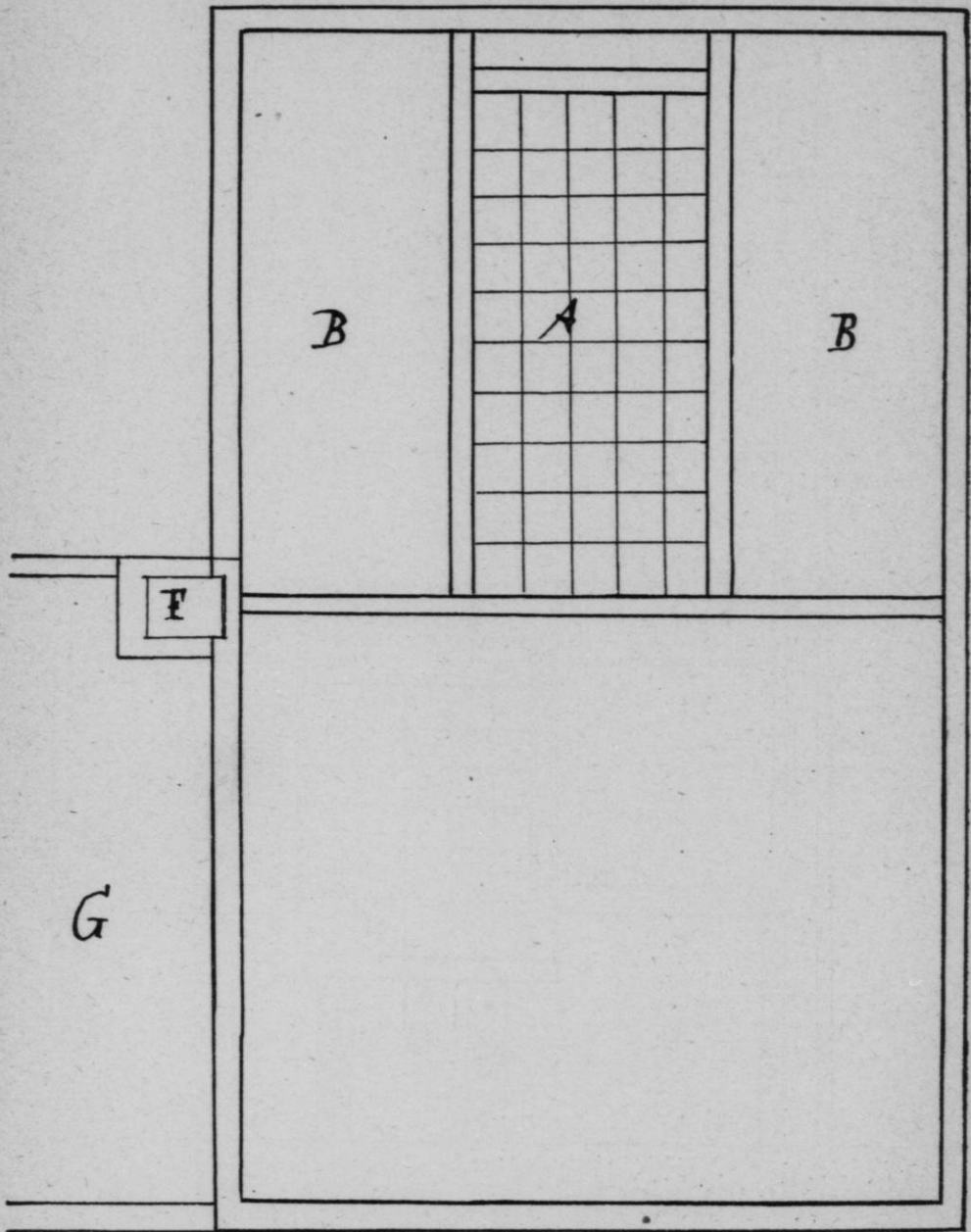
*Fig 4*

FIG. 4.—Shows plan of floor above the curing room and the ice chamber. B, B are store rooms or warm curing rooms. A is ice chamber. F is chimney and ventilating flue. G is boiler room.

DRYING AIR WITH LIME.

I have made a calculation to see how much lime would be required to hold the humidity of the air in a curing room at 70 degrees when its temperature is 60 degrees during the three months—June, July and August.

To make this calculation I have assumed that the lime is fresh, and that the whole of the amount used becomes slacked by the moisture absorbed from the air. I have further assumed that the curing room has the dimensions 20x30x10 feet, and that the air is changed in it once every hour during the period.

Under these conditions the amount of lime required is 3,675 pounds for June, 7,243 pounds for July, 4,491 pounds for August, or 196.7 bushels, in all, costing at 25 cents per bushel \$49.20, allowing nothing for freight and handling.

If I have assumed a too rapid change for the air then to change once in two hours instead of one, the cost of lime would be \$24.60. It should be understood that this cost is the least possible at the price stated, and that the expense is certain to be larger than this.

To change the air in this curing room once each hour would require a ventilating flue 10 in. in diameter through which the air moves at the rate of 2.27 miles per hour.

DRYING THE AIR BY COOLING IT.

There are several methods which are available for cooling the air until it shall enter the curing room at the proper degree of dryness, and I shall speak first of

THE DEEP WELL METHOD.

The mean temperature of deep well and spring water in Wisconsin ranges from 40 to 52 degrees, and this means that if it were practicable to construct a suitable sub-earth duct 30 to 50 feet below the surface it would be possible to cool the air down to 50 degrees and thus render it dry enough for the curing room.

Mr. J. F. Steinwand of Colby, Wis., has written me for advice regarding the construction of a curing room in the new factory he is building. He has a well 2.5 feet in diameter, 64 feet deep, with 16 feet of water which he says has a temperature of 38 degrees F., and we have recommended that he adopt the following plan:

Lower a 10 in. galvanized iron pipe into his well to within a foot of the level of high water in the well and lead this pipe into his curing room which is to be made very tight as shown in figure 1; then connect the ventilation of his curing room so that it exhausts into the smoke stacks from the boiler house, if that is practicable, so as to utilize the waste heat of the engine to force a strong draft from the ventilator of the curing room. By this arrangement the cold air from the bottom of the well would be drawn continually into the curing room, and the water which is condensed from the air in the pipe would drip back into the well. Should this not give air cold enough then it would be practicable to let the tube form a U so as to utilize the water in cooling the air. The most serious objection to this latter plan is the possible danger of the bend of the pipe becoming filled with water condensed from the air passing through the pipe. Should this difficulty arise it would have to be overcome by using a pump to withdraw the condensed water from the bend as it became necessary.

2. THE ICE METHOD.

If the air entering the curing room is first passed over ice its temperature will be lowered and the moisture it contains will be condensed upon the ice leaving the air to pass on into the curing room cold and dry.

A cold air duct could be used in conjunction with the ice and thus reduce the quantity of ice needed, as shown in Fig. No. 2, 3 and 4.

Assuming the same conditions as in the case of the use of lime for drying the air it is found that the amount of ice required is as follows:

	Ice alone.	Ice with cold air duct.
In June	8,388 lbs.	4,933 lbs.
In July	13,250 lbs.	5,097 lbs.
In August	9,685 lbs.	5,097 lbs.
Total	31,223 lbs.	15,127 lbs.
	15.6 tons.	7.5 tons.
	545 cu. ft.	263 cu. ft.

These figures indicate the minimum amount of ice which could be used as it assumes that the whole of it is used in cooling the air which passes into the curing room. Of course there would be some waste and the actual amount needed might easily double the amounts even unless the rate of change of air is made less than has been assumed.

The methods of using the ice might vary a great deal but I shall suggest but one illustrated by the following diagrams, No. 2, 3, 4, which is likely to prove most economical when everything is considered.

3. THE COLD WATER METHOD.

Where cold running water is available either from a large spring or from a flowing well, then it would be practicable to construct a double walled air duct and allow the water from the supply to steadily discharge through the jacket, thus cooling the air which is being drawn through it, or the cold air duct may be laid in a suitable wooden trough through which the water is discharging.

The walls of the curing rooms should be built of wood above ground in preference to stone or brick because the stone and brick above ground absorb so much heat during the day that they do not cool down during the night as wood will. Then, too, the walls should be made not only non-conductors of heat but they should be as nearly air tight as possible. Whenever windows are used they should be double glazed, or better two sashes to exclude the summer heat. If possible have windows on the north and if not they should be provided with outside shades or blinds in preference to inside ones.

Q. What kind of pipe would you use?

PROF. KING.—Ten inch galvanized pipe, but there is no objection to using an ordinary 12 in. drain tile, if they are laid properly, so that they would be strong enough.

MR. MONRAD.—Are the galvanized tiles poorer conductors than the ungalvanized?

PROF. KING.—I think they would be rather better. They are more solid in any case. The drainage from this room, if this is the work-room which overlies these tiles here—the drainage from that should be such that it shall not come down into the ground. If the water is allowed to go down there, it would be imperative that this be sewer tile, and cemented. But that should not be tolerated under any circumstances.

MR. MONRAD.—How would iron pipe do, if it was not for the expense—condemned water pipes?

PROF. KING.—That would be all right. The only question would be the expense. You can get them of any size, and the price increases accordingly.

MR. ADERHOLD.—What would the effect be with a sub-earth duct of a large capacity, 10 ft. deep, leading into a cellar 10 ft. deep.

PROF. KING.—I doubt if we would gain very much by making the duct large. The air is cooled chiefly by actual contact with the ground, and the more surface that you get for the amount of air, the faster it will cool.

MR. ADERHOLD.—I mean so that the air will require a longer time to get through.

PROF. KING.—in that case—for instance, if a current of air were passing slowly through this room, and you were depending upon the walls of the room to cool the air, almost the entire cooling would have to be done by actual contact with the walls, and if it passed very slowly, the air that came in contact with the walls would fall down to the bottom, and you would have a current

of cold air moving down at the bottom, but nearly all the cooling would have to be done by the walls.

MR. ADERHOLD.—Under those conditions I speak of, what would be the temperature of the curing room, and the moisture?

PROF. KING.—Of course, the more completely you cool the whole air down, the more completely you remove the undesirable moisture, the more completely you lower the temperature to the point you want. The trouble of a large duct would be, you take the moisture out of the air that came in contact with the wall, but the rest of the air would have its moisture in it. Of course, the air that you take the moisture out of would lower the humidity of the rest of the air somewhat, but the moisture would not all come out unless you get all the air down to 50 degrees. That is, I have assumed 50 degrees, and worked on that basis. Seventy degrees, saturation would only be reached when the whole air was brought down to 50.

MR. MONRAD.—What diameter would you recommend, so far as you know now, for a sub-earth duct?

PROF. KING.—That would depend upon the size of your curing room.

MR. MONRAD.—For the size that you gave?

PROF. KING.—I think I have taken about the right size for that. Ten in. will change the air every hour, if the velocity of the current is 2.27 (I think it is) miles per hour. That is a slow air-current, and easily secured by such means as I have suggested. Of course, if your room is larger, then more air would have to be introduced, and a larger duct would be needed. But once you have decided the size of the room, or once you have decided how often the air should be changed, it is easy to arrange the proportions. Of course, I am handicapped in this discussion in not knowing what temperature you want, and not knowing how rapidly you want the air changed. I have made the statements as definite as I could.

MR. MONRAD.—In working this room, you said you would have a draught out through the chimney. Will that not interfere with the circulation over the ice?

PROF. KING.—No. My plan would be to carry a duct into this ice-chamber. This is to represent a duct out here. That duct would pass out into the ice-chamber—I will take it up at one end—let the duct run right up there to the end here. Then the air would be brought out here at the top. It would be necessary to put at the top, if you run this duct right up there, a new road there, in the air chamber. The cold air would come out from that duct and run out in an opposite direction. So this duct should run up to the top of the ice-chamber and end there. Then an air-current out there would fall down and come into this room, or this room—that as you have provided the air chambers. You could have dampers in here. If you do not want to carry it through the ice-chamber, you could put an elbow in here and carry it right up into the curing room, and in the late part of the year you could make that flexible and run one way or the other, as you choose. (It must be remembered that in this discussion Prof. King used diagrams, which are printed on another page.)

MR. MONRAD.—And you think the draught will be sufficient even when I have no fire in my boiler?

PROF. KING.—If you have a good height. It is necessary to have a good height, so that the wind as it blows over is operative in producing a draught. Of course, in the summer time it would be desirable if it is made of brick, and if it is made of brick that those should be red brick, or better, painted black on the outside, so that they will absorb the heat of the sun and keep them warm. And if it is a metal stack, the stack should be painted black with the asphalt paint that is used on boilers, for the simple reason of heating the air from the sun on the outside. The brick stack would probably cost most, but it would have this advantage: that it warmed up during the day-time in the sun and held a large part of that heat during the night. All this if it is necessary to have that ventilation, but as I understand it, you do not know just how much ventilation you want. There are ways whereby you can modify those things, if you once learn just what you want.

Q. Would it do any harm to whitewash the room while the cheese was still in the curing room?

PROF. KING.—I can give you no definite answer as to the effect on the cheese. I see no reason why it should affect the cheese.

MR. VAN LEEUWEN.—How would you construct the pipe that runs into the well?

PROF. KING.—I should say a fair weight, not lighter than 20 lbs., galvanized iron, put together in 10 ft. lengths, held together by small stove-bolts, so that in taking it up you can take it up by sections. If the well were in the curing room itself, or in the boiler-house, you would have to make the lengths correspond with the space between the floor and the ceiling.

RECEIVING, SAMPLING, AND TESTING OF MILK.

F. B. Fulmer, Madison, Wis.

Assembled Members of the Convention: Our time is passing very rapidly. I will not take a great deal of it. The man who receives wants to be more than an automatic machine. It means something else besides standing up and weighing and recording milk correctly. It calls for the exercise of the finest judgment, for he has to make minute discrimination, because he selects the materials from which he is to build. Secondly, he has to educate himself to know somewhat of the mysteries of the lacteal fluid. It is a question that can be settled only by experience—something not learned in a day. He has to detect the flavors and odors of milk. Many of them, I know from experience, are very hard to detect. They are something that do not lie on the surface, and we cannot expect to see them unless we look for them and hunt for them patiently. And your patrons may not always understand why you wish to refuse milk. You can be satisfied in your own mind, but you cannot convince them. The best way I know of educating your patrons of today is to gain their confidence. Confidence is what rules one-half of the commercial interests of today. If you have the confidence of your patrons, they will accept your word if they cannot see it themselves. As it is in theory, so it is in practice. I do not believe there is a patron in existence in this state, when carefully worked, that you cannot educate him up to believe what you see yourself. He may be very slow; he may be ignorant, but you can convince him, if you are pains-taking. You cannot convince him if you say: "Here, take your milk home. It is good for nothing." Justice demands that you should refuse to accept milk day after day that the patrons have not cared for properly—justice to yourself and justice to those who are delivering good milk.

Thus we see that all these combined interests work together. The patron, if he is suspicious, may think you are trying to work off a personal spite. He may think you have a personal enmity against him. But if you lead him to have confidence in you, you can work him, and in the end he will be the best friend that you can have.

The first method that was used for taking a sample from the milk each day was a small measure, which was filled each day as the milk was delivered and placed in the sample jar. Uniform results were nearly always attained by this method, and the chances of error were very small.

The next method that comes under our notice was having a small hole in the bottom of the milk conductor-head, where a portion of the milk would be collected as it is run from the weighing-can. A small portion of this was then taken and placed in the sample jar. The same thing could be attained by having a small tube in the bottom of the conductor that would extend about a foot over the end, and the milk to be caught in a small vessel there.

A small-sized pipe-head was also used, the pipe-head being one-third the size of the ordinary milk pipe-head, and taking out a sample each day, and putting in the test bottle and testing every third day. Or, having a pipe-head of a capacity of 5 cubic centimeters, and a test-bottle double the size of an ordinary test-bottle, and testing once a week.

The last method that I will describe, and the one that is the most satisfactory, is that of taking the samples of milk with a Scovell milk-thief. This apparatus takes an aliquot part of the milk as received each day, and, considering all objections, it is advisable to use. With the first two methods, the results obtained in testing were approximately and practically accurate, as long as the samples

are of the same size and the milk received did not vary in quality or quantity from day to day. The objection to the small-sized pipe-head is that if an accident happens, such as spilling a portion of the sample, spoiling it in preparation for testing, or the test-bottle should be broken, the test covering the period from which the samples were taken would be lost.

For preservatives, many different substances have been used. Among those to be mentioned are corrosive sublimate, borax, and boracic acid, salicylic acid, the commercial test powders, and potassium bichromate. Corrosive sublimate, within itself, is an ideal preservative, but on account of its poisonous nature, its use is not to be recommended. Red anilin dye has been used in connection with it, to impart to it an orange color, so the sample of milk will not be mistaken for something else. As far as cheapness is concerned, it will perhaps cost the least of any of them. Borax and boracic acid, salicylic acid, etc., are not always entirely satisfactory, although many good results have been obtained by their use. Potassium bichromate, while it is a mild poison, is not nearly as violent as corrosive sublimate. It is used extensively, and has always given entire satisfaction. It has the additional advantage of imparting a deep orange color or tint to the milk, without the addition of any anilin matter to indicate its nature. Another method that has been recommended is that of taking samples each day and placing them in the test-jar, with no preservative whatever. At the end of the week, or whenever ready to test, of course the milk will be coagulated. A small amount of concentrated lye is then added to the milk, a portion at a time, and the sample well shaken, until enough has been added to break up the curd and render the mass homogeneous. On account of extra time required and additional cost, this is not to be recommended. Great care should be exercised with the sample-jar from day to day, as each new sample is added. After a fresh sample has been placed in the jar, it should be given a slight rotary motion, with perhaps two or three turns, to get the cream loose from the edge and to mix it with the mass of the milk. Too much whirling or shaking should be avoided on account of the danger of churning the cream. Care should also be exercised not to allow any cream to become stuck up on the sides of the sample-jar above the level of the milk, so as to dry out and adhere to the sides, so when the milk-level reaches above it, it will not wash off. A cover should always be kept on the jar, so as to prevent loss by evaporation. The sample should be kept in a cool, dark place. If exposed to direct sunlight, a chemical action takes place and a harder curd is formed, which is very hard to dissolve with the acid, when making the test. The composite sample will always be a little harder to manipulate than one of fresh milk. It will take longer to dissolve the curd formed by the action of the sulphuric acid after the same has been measured into the test-bottle, but no more acid will be required, as the action of the chemical itself compensates to a slight degree for sulphuric acid. If too much potassium bichromate is used for preserving, a dark or discolored test will be the result. The amount necessary to preserve a sample will be learned by experience. Ordinarily speaking, the amount necessary to preserve a pint to a quart of milk one week will be about half as much as will lie on a cent.

I want to say a word that it pains me to say—I say it with sorrow—that there are some cheese factories that have tried the test and given it up. The test has has come to stay with us—there is no question of that. The only question before us is, how quick will it be universally adopted. That is the question. We do not want to be self-sufficient in our minds, but we want to go out and instill the principles of justice and system into the minds of the patrons, and the time will come when the test will be universally adopted throughout this country, and justice will be awarded to every man according to his dues.

DISCUSSION.

MR. MASON.—The factory that I am going to is about to quit using the test, and I found the reason was that the cheesemaker that had used it last year made a very poor composite test. In fact, he had never seen any test made, except about one week at Black Earth. He got them to feel that the test was not the right thing, and I was called on, when I went there, to get up and explain what was really the fact, and really a great many farmers are coming down on the test.

Q. I would ask you whether you have used the corrosive sublimate test, carry-

ing the sample two weeks? I think the results are just as good. In fact, I took a sample from the same milk and carried it two weeks, and I could not see that it made any difference. I got just as good a test—just as high a test.

MR. FULMER.—There is no question but that as good results can be attained. The great point with most factories where they test is that the sample would be somewhat larger, unless they have a smaller apparatus to collect the same with. Of course, in hot weather there is a doubt as to good results, on account of souring, or something else.

Q. What results have you had in preserving with commercial preservatives?

MR. FULMER.—I have had very little experience with them. Those that I used were entirely satisfactory, but I did not use them during the extremely warm weather. It was during the winter season, as I remember.

Q. What was your method of warming up a sample?

MR. FULMER.—Set it in a pail of hot water, or something of that sort—any vessel you could put warm water in—and gradually stir the bottle around while you are warming it.

MR. ADERHOLD.—I had no difficulty in inducing my patrons to accept the system of dividing by the test. I did it in this way: At the annual meeting in the spring I had one of the patrons bring some milk with him, and I explained to them that the system of dividing by the test was just. I then took two samples of that milk in the test-bottles, and took the remaining milk and added an equal amount of water to it. I took two samples of that also, and I said: "We know that the milk in these first two samples would make about as much cheese as the milk in the other two samples. Now let us see what the test says." We made the test, and after that they were all very anxious to have their milk taken by the test.

MR. WINSOR.—I would like to ask Mr. Decker how high he has ever known the milk average in winter, at the factory? I visited a creamery this winter where milk tested so high that it surprised me—a great many days as high as 5 or 6%. I did not doubt but that the test was all right, but I did think they must have a good lot of cows.

MR. DECKER.—Generally speaking, I never heard of milk testing over 3%. Seldom been under that.

MR. WINSOR.—Would it be possible to go as high as 4 and 5%?

MR. DECKER.—It might be possible. Depends something on the local conditions.

MR. WINSOR.—Have you ever known of patrons who brought milk that would test upward of 5% all the winter?

MR. DECKER.—Not a large proportion of the patrons.

MR. WINSOR.—This that I speak of they almost all tested that. Nearly all of them tested so high it was a surprise to me.

MR. POWELL.—I know that factory. One of my patrons left my factory and went up there. The best I could make of his milk was 4.2. The other factory made it 6.2.

MR. SCHOENMAN.—I would like to ask the gentleman whether he had seen the test they were using?

MR. WINSOR.—The operator told me that he used the pipe-head to measure the acid with. Found it much more convenient. There was a slight variation of acid, but it made no great difference.

MR. FULMER.—Did you see any samples tested?

MR. WINSOR.—No, sir. I saw them in the composite jar.

MR. MONRAD.—In taking your samples, composite samples, do you heat it up? Do you place your bottles in warm water?

MR. FULMER.—Not unless the cream is clotted. If we can get the cream back by pouring the milk from one vessel to another, we do not warm it up. Otherwise we warm it up.

MR. WINSOR.—What would you do in this case? I have one patron that has very rich milk, and it bothers me considerably. The cream seems to be quite thick, and the sample will often churn before I can get the cream mixed with the milk. When I go to test it, before I get the jar shaken enough so it is mixed, it often churns, and when the cream stands on the top, I do not get a very good test.

MR. FULMER.—Did you ever try warming it?

MR. WINSOR.—Yes, I tried warming. It does not work that way all the time, but is apt to.

FERMENTATION TEST.

G. B. Winsor, Mauston, Wis.

Among the several scientific tests which have been so successfully applied to cheesemaking to determine the richness, acidity, and quality of milk, the fermentation test is by no means the least in consideration. Like many other good devices, it is very simple, and if properly used, is the cheesemaker's guide and compass.

The apparatus for this test consists merely of a set of pint jars corresponding in number to the composite jars, and conveniently arranged in or near the weighing room. These are not to be used every morning like the composite jars, but at such a time as the maker finds himself in perplexity as to the cause of the trouble, when about half a pint of milk should be taken out of each patron's milk as delivered, and put into his jar, taking care to screw the cover down tightly. Then, some time during the day, when the cheese is in the press and the rush of the work over, these jars are taken down and placed in warm water, say from 98 to 110 degrees Fahrenheit. By this time any bad ferments which may have existed will readily be detected, for we all know a bad ferment, after standing five or six hours, will predominate and come to be a prevailing ferment. For example, milk that was delivered to the factory very cool, when none but the most expert could detect a bad odor, would give it off so plainly that even the patron would easily be convinced that his milk was not right, and this jar shown him the next morning will do a good deal toward bettering the quality of his milk, and, perhaps, right then and there the cause of the difficulty may be ascertained.

This is also a good method of detecting over-ripe milk, as a jar that is found to be lobbred by noon must have contained an excess of acidity. It is also one of the most essential tests to be applied to milk in the winter time, as such milk is often contaminated with bad odors, which are not easily detected in very cool milk, unless we stop to heat up a small sample of each separately, which we all know the maker does not have the time to do, with ten or fifteen patrons waiting, so he trusts to his luck to find the defective milk, but does not, as it is too cool, and consequently he weighs it in, good, bad, and indifferent. Then when he comes to heat it up he finds to his sorrow that the milk which should have been rejected has again passed his inspection, and that his milk contains a bad odor, and the old trouble which has been bothering him for several days is still there.

This will not do, as it has been thoroughly demonstrated that to make a right fine cheese, none but the very best milk should be used. So one can easily see if this test is correctly and intelligently followed at such times as it is found to be needed, the trouble can be traced home to the one who is to blame for it, and so is the direct cause of keeping none but good milk coming in, and with this to start with, the battle for a good cheese is half won. No factory should be considered to be properly equipped without a set of fermentation test-jars, as this accurately gives to each patron the credit of delivering good or bad milk, as the case may be, and thereby enable the maker to quickly put things to rights and save both himself and the patron from what might be a loss of many dollars.

DISCUSSION.

MR. MONRAD.—How high do you heat that milk?

MR. WINSOR.—Usually about 100 degrees, or 105.

MR. DECKER.—You tried that all through last summer?

MR. WINSOR.—I tried it every time I found it was necessary.

MR. AUSTIN.—When you put the rennet in, do you heat it to 100?

MR. WINSOR.—I do not use rennet with this. This is simply the fermentation test.

MR. DECKER.—With the fermentation you get the gas as well as the flavors.

MR. WINSOR.—Last winter while at this convention, Mr. Monrad, in a report I was asked to make, asked me if I had ever used the fermentation test. He told me how it was, and when I got home I bought a set of pint jars, and I have been using it ever since. The jars are arranged on a shelf and numbered with

the number of each composite jar, and then you have the patron when you want to look it up.

MR. MASON.—Then the fermentation test is simply putting the milk into jars and letting it stand, and the appearance of that milk and its odors would tell you what kind of milk it is?

MR. WINSOR.—If I should have a bad mess of milk and did not detect it in the morning, when I weighed my milk off the next morning I would take a sample from each patron, but if I did not catch it with this, with these fermentation jars I could track it right back to the patron who delivered it. It gives a little more time in the afternoon.

MR. ADERHOLD.—Have you had much experience in making the fermentation test with morning milk by itself?

MR. WINSOR.—Only once or twice.

MR. ADERHOLD.—Why did you not take a morning's test?

MR. WINSOR.—I did once or twice, I had a little trouble with sponge that morning. It was not bad. I could not detect it in my milk in the morning, and I could not detect any bad odor.

MR. ADERHOLD.—Did you think it was in the feed or care?

MR. WINSOR.—No, I thought it was more in the care of milk.

MR. ADERHOLD.—You could tell by testing the morning and night milk separately whether it was in the care or feed.

MR. WINSOR.—I thought it must be in the care of the milk.

MR. DECKER.—I do not want to intrude here, but the gentleman has mentioned that he had trouble with gasy milk some of the time, and in some cases where there was a bad flavor. In our curd test we have been able to trace up both the bad flavors and the gas, and we have found that some milk may be pretty gasy, and still not leave a bad flavor in the cheese. On the other hand, a curd may be fairly solid and still be badly off.

MR. WINSOR.—Yes, I had some that way this summer. The cheese did not seem to have a bad flavor. I will not say that they were fine flavored cheese, but they did not have a bad flavor.

MR. DECKER.—A student in Fond du Lac tried this curd test. He was troubled with bad flavors, and he traced the trouble to two patrons. One of these patrons insisted that his milk was all right. The cheesemaker made a test for him, and he finally admitted that it was off flavor. They traced it to the cows eating water cress, and after the patch of water cress was fenced off they had no more trouble.

MR. ADERHOLD.—Which do you think is the best to detect a bad flavor—the curd test or simply the fermentation?

MR. DECKER.—I should think the curd test, because you get it in the same condition as in the vat.

Q.—What kind of apparatus do you use?

MR. DECKER.—The apparatus is similar to that described by Mr. Winsor. There are bottles. Those bottles have to be cleaned. If there are any germs in those bottles, they may cause trouble for you. We have a tank made for the bottles to set in, and a wire frame, so that when we put water around the bottles, they are not upset. Our tank will hold 60 bottles. As soon as we take a sample of the patron's milk it is placed in this tank and warm water put in, according to the temperature of the milk. If the milk is very cold, we would probably have the water at 15 degrees, so that the milk is brought up to about 98, and we use ten drops of rennet extract to curdle it, with a pint jar about two-thirds full. After it is curdled we break up the curd with a case knife. We are careful enough to change the knife back and forth before the milk is curdled, so as not to mix the breed. Then after it is broken up we let it stand until the whey comes out, and keep pouring off the whey till we get a firm curd. It is necessary to get a firm curd, otherwise we do not get the best results with the test. It is not necessary to test every patron's milk every day, but you can test them occasionally and keep the run of their milk.

MR. ADERHOLD.—Do you keep those bottles covered all this time?

MR. DECKER.—All bottles are kept covered. I was counting up the results of our tests. We had taken 10 to 20 patrons' milk every day for two months, and we have made a test in duplicate. We made 420 tests in duplicate. Our milk, as I believe I explained yesterday morning, is specially good milk. We are pay-

ing a good price, so that you would not expect a great deal of difference in them. These tests were made in duplicate, and the results were not compared until the notes were put down on paper, and afterwards copied into a book. Of these 420 tests there were 39 cases in which the duplicates did not agree on flavor, and 40 in which they did not agree on texture, and there are a good many things come in to bother us. These students do not know just what to look for. Have not had a great deal of experience, but I think that is remarkable, to get such results on milk like that. Out of 420 duplicates, only about 40 where they did not agree. Mr. Winsor spoke about being able to locate over-ripe milk. By the sample of curdled milk there is something more definite than that. Patrons may say it was not over-ripe, and between them disagree. There ought to be something definite to show them. The test suggested by Dr. Russell that was first brought out by Prof. Farrington are the alkali tablets. The alkali is put in tablets and you make up a double solution. Then by taking 20 cubic centimeters of milk in a little cup made out of a cartridge and 20 cubic centimeters of this solution, and mixing them together, if it remains colored, you may know that the milk does not test over .2%. If the color is gone, there is excessive acid there. You can establish a standing of .2% throughout in the milk, and let that be a test. You have something definite to show them there.

MR. WINSOR.—Yes, I have used them all summer—Farrington's alkali tablets. It does not really seem to me necessary for any practical cheesemaker, if the milk is at a normal temperature, to have any test for sour milk in the morning.

MR. DECKER.—Except that the patron may say you are lying.

MR. WINSOR.—In taking samples from cold milk, in looking these jars over, it gives you a pretty general idea of the milk you took in in the morning.

MR. ADERHOLD.—I would like to ask the gentleman: "Did you use that alkali test in conjunction with the rennet test in ripening your milk?"

MR. DECKER.—No, sir, I did not. I just had the alkali tablets and got a number of cartridge shells and had a little wire handle soldered on. Since then I think they have a little finer outfit than that.

MR. ADERHOLD.—Why do you not use the two tests together?

MR. DECKER.—I never thought of that.

MR. ADERHOLD.—Is there any relation between the two tests?

MR. DECKER.—I always made my rennet tests separate from the alkali tests.

MR. ADERHOLD.—You refer to milk that is ripened?

MR. DECKER.—Milk that is ripe enough to set will show about .2%, whether ripened normally or with starter. The acid is what the rennet test shows.

MR. ADERHOLD.—Rennet shows only one kind of acid.

MR. DECKER.—It shows any kind of acid. If it has acid it increases the action of the rennet.

MR. ADERHOLD.—At the station in Minnesota Mr. Hecker made some experiments, and he found no relation between the two tests.

MR. DECKER.—We trace it all through last year and the year before. Any kind of acid increases the action of the rennet.

MR. WINSOR.—I will agree with Mr. Decker that using this alkali tablet test does not help a maker out a great many times. I had one or two patrons that were pretty cranky about sending milk back, especially milk that was only a little sour. With this test you can say: "Here is the test used at the dairy school, and when it has a certain amount of acid in it, I do not want to handle milk that they do not dare to handle at the dairy school."

MR. ADERHOLD.—If milk has .2% acid, how fast will it work?

MR. DECKER.—You will get an $\frac{1}{8}$ inch acid in about two hours. I should say the casein has an acid reaction before and after you have curdled the milk and taken the test of the curd. The whey develops enough acid to show .2%, and you get $\frac{1}{8}$ inch of acid.

MR. MONRAD.—I think the cheesemaker may get a little practical experience on this point. I think it was the first time I heard that a manufacturer had brought out the acid test to use instead of a rennet test. I was very much interested in it. I went out with the old style Harris rennet test and the acid test, but I could not see any definite relation. Taking it on the whole, the experiments run parallel, but there would be several cases that ran out. I came to the conclusion that the acid test could not take the place of the rennet test.

MR. DECKER.—The rennet test is very much more sensitive to those conditions than the acid test.

MR. MONRAD.—That was really what got me, so I started in with the Harris test and found it was not close enough.

MR. DECKER.—Another thing I want to say; with very little rise in the per cent. of acid. I have seen milks up to 120, rennet test, and they would test about .12% of lactic acid, and by running it up to .04 or .05 of acid, it would make a difference of about 60 seconds in the rennet test. The next 10 seconds would show a wider range in the per cent. of acid. It is not the regular scale that runs down there.

MR. MONRAD.—But I understood you to say that they were related.

MR. DECKER.—They are at that one point, .2%.

MR. MONRAD.—You agree that the acid test cannot take the place of the rennet test?

MR. DECKER.—Yes, sir.

MR. ADERHOLD.—When I said that they found no relation up there, it was all through their testing, not at the time of setting.

MR. AUSTIN.—I would like to ask Mr. Decker how long he would leave it in the whey if you had .3%?

MR. DECKER.—You would already have about $\frac{1}{8}$ inch with your .3% before you set the milk.

MR. ADERHOLD.—Have you tried that, Mr. Decker?

MR. DECKER.—You can curdle it, and by taking the curd in the rennet test, firming it up immediately, you will find that you have it

CHEDDAR CHEESE MAKING.

Edwin Hauk, Neenah, Wis.

The past two seasons, in having charge of the factories operated by N. Simon & Co., of Neenah, I have observed there are a great many precautions to be taken in order to produce a fine cheese: A cheese that will demand the top market price. We know a cheese should be of the right height, neatly bandaged, close made, clean flavor, good body, and well cured. I have received the best results by being careful in teaching the patrons to deliver their milk at the factory as pure and sweet as possible, thereby producing my own lactic acid or starter. I had a sufficient quantity of starter to the milk, so as to have it ripen to the setting point shortly after the milk is received, and at a point to secure a good cook with time from setting to dipping, not to exceed two and one-half hours. This will give me sufficient acid, say 2 to 2½ inches, on the curd, after maturing on the racks for about two hours; then grind, after which I air the curds for one-half hour, then wash down with warm water about 90 degrees Fahrenheit, just previous to salting.

I have experienced very little trouble in getting a fine cheese made, when receiving good, pure milk, and when I could secure a good clean starter. I visited patrons at their homes and explained to them the proper way to handle and care for their milk, so that it would produce a fine article, and also cautioned the makers in regard to their keeping the factories neat and clean, and I am assured that it did a great deal of good. But yet in the hot summer months we have to contend with more or less of tainted milk, and in many instances it is impossible to secure milk of every patron that is pure and free from taints. If we have tainted milk and an impure starter we cannot improve the quality of our cheese, but if we can secure a pure starter or prepare one by using the lactic ferment, we certainly can improve the working of the milk and obtain a better quality of cheese, and a larger yield as well.

Last season was my first experience in using the lactic ferment in preparing starters. We used it in several of our factories and found it very valuable in working up milk that was off flavor; it seemed to improve the flavor and quality of the cheese. No maker can afford to operate a factory without the lactic ferment, as in preparing his own starter he does not always know just what kind of flavors he is introducing into his milk.

I find the best cheese made where the maker is neat and clean in his factory and precise with his work, and observes the changes in the working of the milk and curds from day to day. In this way he familiarizes himself in the best methods of handling the different grades of milk he receives, and turns out a better and more uniform class of goods. We weighed the green cheese every day from the hoops of all the factories, and kept a report of these weights. In this way we were able to note the differences in yield from day to day and be able to locate the causes of these variations.

DISCUSSION.

MR. WINSOR.—I would like to ask if anyone has used the commercial starter—lactic ferment.

MR. ADERHOLD.—The first cheesemaker in Wisconsin that used it extensively was Mr. John Michaels, and that was during the season of 1895, and it is now being used in a number of factories in Winnebago county. Three factories in Sheboygan county used it last season, one factory in Manitowoc county, and it ought to be used in all the rest of the factories.

I like to run up against Mr. Monrad. I am going to do it again. Mr. Monrad claims that the starter is just as good, just as effective, if it is made from perfectly pure milk as a starter that is made from commercial culture; but I find that it is not, in cheese making—that lactic ferment start has a great deal more control over the development of acid and the flavor of the curd than that made from common milk, even if it is fine milk.

MR. MONRAD.—Mr. Chairman, I will give right in, because my practical experience with lactic ferment was only in butter making. I have never made a cheese with lactic ferment, so I give right in.

MR. WINSOR.—The reason why I never tried it was because several makers told me it injured the keeping quality of the cheese, but if it is all right, I should like to use it.

MR. ADERHOLD.—I know an old butter maker who had made cheese said it did not keep as well.

MR. BAER.—I believe Mr. Schoenman has used this lactic ferment this last season. We would like to hear from him.

MR. SCHOENMAN.—I used it somewhat this last summer, and I liked it very much, but I believe in using the lactic ferment, it is more in the extra work in putting in the starter than it is in the ferment. Of course, I would not object to using the ferment, but I believe a man who is very careful the other way would have very much better effects.

MR. DECKER.—Did you have any complaints from your buyers of sour flavor? Can we have a show of hands of those who have used starters? There are about 35. Now a show of hands of those who have had complaints of sour flavor in the cheese from the use of a starter. Not any of them. How many think it is a good thing? Practically all of those that have used it. There have been complaints from a few buyers that the starter gives a sour flavor to the cheese. It does not look as though the makers had had that experience here.

MR. MONRAD.—Mr. Decker, I think it is from the extra work, and not from the use.

MR. CARSWELL.—I think there are a great many of the boys that make a misapplication of the starter. If they use a starter and use it properly, and just enough to ripen the milk to the .2%, or the right figure, so that your curds will be ready to go on the rack at two and two and a half hours, you never will have a sour flavor, provided your starter is kept wholesome.

MR. DECKER.—I should like to ask these questions: When should a starter be used, and what per cent. of starter, and what should be the condition of that starter when it is put in.

MR. CARSWELL.—I should say I believe everybody will use that according to common-sense. If you have good milk that is already ripe, you do not want any in.

MR. DECKER.—But how high a per cent. should a starter be in?

MR. CARSWELL. It ought not to be too much. I would never have over 25 pounds of starter for 2,000 pounds of milk, at the very highest ratio of starter.

MR. DECKER.—That is a little over 1½ then. How sweet should milk be before you use a starter? How long will it take to ripen?

MR. CARSWELL.—I would use enough starter so that I will be ready to go to work pretty soon after I have the milk in. But sometimes milk will come in so sweet in cold weather that you injure the quality of the cheese if you add starter enough to go to work in the morning. But if you let it stand after the starter is all in, say in an hour or an hour and a half your milk is ready to go to work in.

MR. FAVILLE.—Would it be proper for me to inquire just at this point why, with all these starters and rennet tests, etc., we do not get near as good cheese today as we did fifteen and twenty-five years ago? If any of these fellows can tell the reason? It is a fact. The complaint is well nigh universal that the cheese that is put upon the market in the city of Madison, or anywhere else, is not anything like the quality of cheese we used to get.

MR. ADERHOLD.—I believe the best way to answer that question (ran up against that more than once by the old makers) would be to set them to work again now, making cheese with the milk that we get.

MR. FAVILLE.—If the milk is not as good, and all of that, what is the use of preaching and talking?

MR. SPOONER.—I believe these starters are a humbug. This gentleman spoke about some of the old cheesemakers. I have made cheese a good while: I have got cheese that I made last year that I will put down against any cheese in this state, and I never used a starter. The cheese is here. I would like to have you sample one. I never use any starter. I think that milk sprouts soon enough as a general thing, especially through the summer months. We want to hurry it out too quick. I find in my experience that if I can hold that curd in the whey for four hours, I will get a much better cheese. There is no question about it, and I never practiced using a starter.

Convention adjourned to meet at 2 p. m.

Convention met pursuant to adjournment.

WISCONSIN CHEESE PRODUCTS.

Dairy and Food Commissioner H. C. Adams.

The total annual cheese product of the United States is 260,000,000 pounds, in round numbers. New York produces almost one-half of this amount, and Wisconsin fully one-fifth. Nearly all the cheese made in the United States is produced in the states of New York, Wisconsin, Ohio, Illinois, Vermont, Iowa, Pennsylvania, and Michigan. There is imported annually into the United States \$1,000,000 worth of cheese.

The following table shows the rise and decline of cheese exports since 1850:

Periods.	U. S. (Pounds.)	Canada. (Pounds.)
1850	10,361,189	17,000
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	20,114,568
1876-1880	103,606,609	40,676,856
1881-1885	118,813,685	61,502,949
1886-1890	88,303,313	83,737,133
1891-1895	75,977,114	135,679,207
1893	81,350,932	133,946,365
1894	73,852,134	154,977,480
1895	60,448,421	146,004,650

The value of the cheese exported from the United States in 1895 was \$5,497,539, Canada exporting during the same year \$14,253,002. The following table indicates the growth in cheese production in Wisconsin, giving the product of alternate years since 1877:

Year.	Pounds.	Year.	Pounds.
1877	14,351,046	1887	33,799,067
1879	16,407,145	1889	45,726,573
1881	22,464,259	1891	54,365,220
1883	23,785,354	1893	45,553,490
1885	27,893,818	1895	36,116,865

These figures show a steady increase in the cheese production of the state until 1891, when the filled cheese industry began to get in its deadly work in competition with the legitimate cheese industry, when the increase suddenly stopped, and in 1895 there was a marked decrease.

SPURIOUS COMPETITION STOPPED.

The passage by the legislature of 1895 of the law prohibiting the making of filled cheese in the state, and the enactment of the national law providing for a tax upon filled cheese and the payment of licenses for its manufacture and sale has practically relieved the cheesemaking industry of the competition of a spurious product. The legislation referred to had brought an increased demand for Wisconsin full cream cheese—a demand which has undoubtedly enhanced the price during the last six months at least ½ cent per pound. The Wisconsin cheesemaker will now have an equal chance in the European market with his Canadian competitor. There is now no reason in the world why we cannot regain our old standing in that market. There is no better cheese manufactured anywhere than has been produced in this state, and it lies entirely within the hands of the members of this association and the men engaged in the same line of business with them, whether or not we shall push Canada in the cheese markets of the world, as we did before, filled cheese destroyed our reputation.

IS ADDITIONAL LEGISLATION NEEDED?

The manufacture of filled cheese, as you know, is now prohibited. The law provides that no skim-cheese shall be manufactured or sold which is not ten inches in diameter and nine inches in height. The purpose of this law was to compel the manufacture of filled cheese in such form as to advise the purchaser of its character, and also to discourage the manufacture of such cheese without going to the extent of absolutely prohibiting it. Two cases have occurred which have been brought to the attention of this commission of violation of this law, and prosecutions and convictions have followed.

It is questionable whether or not any additional legislation is needed to protect our cheese-producing interests. It has been suggested that a law be passed requiring the purchasers of cheese to brand the cheese purchased with the name of the buyer, and that the factory-man selling the same also brand the cheese with the name of the factory and its location and the date of its delivery, for the purpose of identification when sent into outside markets. I bring this up for your consideration as a bill bearing upon this matter will probably be introduced into the present legislature. The claim is made that irresponsible buyers from without the state come in here, pay more than the market price for cheese, obtain a contract to have it delivered, and upon its receipt in Chicago or elsewhere inform the seller that it is below standard, and send him a remittance below the

regular market price; and that a law of this kind would secure the identification of cheese over which any such controversy might arise.

The state so far has given the cheesemakers all the legislation which has been asked for. It now remains with the cheesemakers themselves to determine whether or not the grade of our product shall be raised. The members of the dairy and food commission, who have inspected a large number of creameries and factories in this state, have found in very many instances factories conducted in anything but a clean and business-like manner. Many factories are in locations where good drainage is impossible. Many of them have no sufficient supply of good water; many of them have whey tanks adjacent to the factory, unclean and smelling to heaven with carelessness, and many of them in their management have neither system, order, or cleanliness. The most general defect perhaps in Wisconsin factories is a lack of proper curing rooms. The experiment station at the Univer. is now engaged upon some excellent work in determining by experiment what kind of a curing room is best adapted for this purpose, at what temperature cheese should be held at different stages, and what the humidity of the air should be in those rooms.

Good cheese may be produced; it may be handled with the cleanest utensils and stable and furnishes the most hope for the future.

with the cleanest hands, made up in the best approved manner known to modern skill, and yet, if it is sent upon the market unripe, it is an indigestible disgrace to the cheesemaker who sells it.

Statistics show that the consumption of cheese in the United States is diminishing. The cause of this can be nothing less than the deterioration of the quality of American cheese. If our cheesemakers are wise, they will not only make cheese which will meet the requirements of European tastes, but they will also put cheese upon the market which will suit the home demand. We do not hesitate to buy a million dollars' worth of foreign cheese annually and pay from 50 to 100 per cent. more than is charged for our domestic cheese, simply because it suits the public taste. The people of Wisconsin eat 6,000,000 pounds of cheese per year. If they could obtain an article as good as the Wisconsin cheesemaker is capable of making them, they would eat 20,000,000 pounds per year. The cream of the product, should, if possible, be put on the home market, which is the most

The cheesemaker should be honest; he should be clean, he should have the nerve to insist that the patrons of his factory shall bring clean milk of good quality. He should have knowledge enough of his business to know how to make a good full cream cheese and cure it properly, and he should know enough of general business methods to sell his product to men of character and good financial standing. This association can accomplish a great deal for Wisconsin by making a most vigorous effort to embrace within its membership as many of the cheesemakers of the state as possible; by making a large and aggressive organization to aid in the execution of such laws as may affect it; to engender enthusiasm in the business, and to make common and popular the best methods of cheesemaking.

DISCUSSION.

MR. C. A. WHITE.—I hear in Chicago that some of the creameries in southern Wisconsin are going to make skim cheese, not in the shape required, and I would like to ask Mr. Adams, if in view of this fact, they will not be attended to?

MR. ADAMS.—I think that is quite possible, but I think if that should be done, and the Dairy Commissioner should be notified, it will not be difficult at all to prosecute them and drive them out of the business.

MR. C. A. WHITE.—Would you have to be notified in the event of their making cheese contrary to what is required, or would you have your men out?

MR. ADAMS.—Of course when we get rumors of that kind, we always run them down, and ascertain whether or not they are correct.

MR. C. A. WHITE.—But there is such talk in Chicago, that some of the people up here are going to make skim cheese, contrary to law.

MR. ADAMS.—I should think it would be quite likely that they would undertake it, but I think that the law will hold and will stand pretty rigid test in the courts. I know that in the cases we have prosecuted we have had no trouble in prosecuting them. I do not think it has been attempted to a very great extent; but in every case we have run down, except two, we have been successful.

MR. WHITE.—Now in regard to your statement about branding cheese—I do not think that law would hardly do. People who buy cheese honestly and sell honestly do not want cheese all branded up, and all that sort of thing; it would hurt the trade.

MR. ADAMS.—I am very glad that the gentleman referred to that. I do not advocate the passage of such a law. I simply stated that it would be introduced. I know that a member of the legislature is earnestly in favor of such a measure, and such a bill has been drawn. It seemed to me questionable whether or not it was good policy to have such a law incorporated. This is a question that I wanted this cheesemakers' association to discuss and determine.

MR. C. A. WHITE.—I do not think it would be good policy.

MR. ADAMS.—The point made was this: That some of these shippers from Chicago come up here and go to the factoryman and offer him a quarter of a cent more than the market price. They secure the contract to have the cheese delivered, and upon its receipt in Chicago they inform the seller that it is below the standard, and send him a remittance below the regular market price; and the purpose of this branding was so that any particular cheese could be brought into court and identified if necessary.

Q. Why do these salesmen of the different factories sell to these men whom they know to be designers? It has been my experience that the fault lies with the salesmen who are appointed to sell the cheese; they know they are taking chances, still they will run their chances every time.

MR. ADAMS.—Yes, I understand that; and I suggested to the gentleman who favored this bill that it was almost impossible by law to compel the seller of cheese to be thoroughly business-like in his methods.

MR. DIXON.—The fact is a great many of the so-called buyers engage men who do not know a cheese from a tub of butter, to do this for them, and they send the cheese in to those irresponsible parties in Chicago, and I think they are justly entitled to what they get. Now, if the boards of trade will insist upon having their cheese inspected by those irresponsible parties before they leave the factory, and if the buyer have a private mark or brand so as to know that he got what he really bought and what he expected, then I think this difficulty could be overcome, without branding the cheese. A great many buyers buy a special brand of cheese, and sometimes give a little more in order to satisfy their customers; they do not think it necessary to have the name of the factory published all over the world. There are only a few buyers that come into Wisconsin to buy their cheese; and they usually buy through their brokers. I am a broker myself, and I know how this business is done.

MR. C. A. WHITE.—Now, Mr. Adams, in regard to increased cheese production in Wisconsin, I agree with you that the production could be increased if the people who want good cheese could get good cheese. The factories who have the cheese rejected two or three times will go into the city and trade that cheese off for groceries; this the grocers sell to the people, and consequently the people get bad cheese, and they won't eat it. If we could get a good article the consumption would be increased.

MR. ADAMS.—I think that is right, and I have a little illustration of it in my own mind. A year ago I was down to Janesville, and Governor Hoard gave me a piece of cheese made in Sheboygan county, and the family were delighted with it. It was just exactly as good a cheese from every standpoint as that exhibited in this association yesterday from Canada. It was an excellent cheese. But the cheese I get from a majority of the grocery stores will remain on the table day after day, and perhaps half of it thrown away; and we stop buying. That is the experience of a good portion of our people in the cities in this state.

MR. MONRAD.—Is there any filled cheese made in Wisconsin, under legal regulations?

MR. ADAMS.—Not that I have ever heard of.

MR. E. L. ADERHOLD.—Is there any filled cheese made in the United States legally?

MR. ADAMS.—Of course that is a pretty comprehensive question. Of course we know from the internal revenue reports of filled cheese being manufactured, but it is on a comparatively small scale. There is none manufactured in this state; at least the commission has endeavored ever since the filled cheese law went into effect to ascertain whether filled cheese has been made, and we have

been unable to do so. The internal revenue office has searched from end to end in this state and they have found none.

MR. C. A. WHITE.—In regard to filled cheese, when I was in New York a shipment of filled cheese came through there; it was supposed to be branded in the usual manner prescribed by law, but instead of being branded in letters that were distinct "Filled Cheese," it was branded in line letters, very small line letters, so that you would have to turn the cheese over to read "Filled Cheese." Another thing, those cheese had two bandages on each side, so that the outside bandage could be stripped off, and the cap which was branded could also be taken off, and no one would know whether it was filled cheese or skim cheese.

MR. ADAMS—Of course, Mr. White, the cheese you speak of as branded in line letters was illegally branded, and it is the fault of the treasury department and its agents if they do not enforce the law.

There is just one question I would like to ask of this association, and that is with reference to the collection of statistics. Now I have in mind the preparation of a bill which will require cheese factories and creameries of this state to report to the Dairy Commissioner, upon blanks which shall be furnished him, certain facts with reference to their business; the location of the factory, the capital required, the amount of milk received, the amount of cheese or butter produced, the amount paid for labor and the amount received for the cheese or butter. This affords a means of obtaining comprehensive and accurate dairy statistics. I would like to inquire if there is any objection that can be raised by the cheese-makers to a law of this kind?

MR. C. A. WHITE.—I should think that would be a good law. I think it ought to be enacted by this association.

MR. AUSTIN.—I make a motion, Mr. President, that this convention endorse it. The President put the motion which was duly carried.

REVIEW OF THE CHEESE BUSINESS OF WISCONSIN FOR 1896-7.

C. A. White, Fond du Lac, Wis.

For the purpose of this paper, we can transform the old saying of "a good beginning makes a bad ending" to "a bad beginning makes a good ending," and this latter sentence is applicable to the situation today in the cheese trade. I do not remember a season when the outlook for business in the cheese trade opened so gloomily and depressing as it did last May. Everyone who had carried cheese through the winter from 1895 was losing 50% of their investment, and it is not to be wondered at that when the markets opened last spring the price was at a very low figure, as it was difficult to determine real values, and dealers had to feel their way along. The export trade for the time being was dead, and instead of cheddars being made during the months of May, June and July, this amount of cheese being exported out of the country, it was made up into twins and America shapes, thus still adding to the uncertainty of the situation and making an over-plus of cheese in cold storage.

If this was not enough to harass and destroy all confidence, the trade had to contend with the uncertainty caused by the money plank of one of the great political parties. This money question threw the banks into a semi-panic and loans were refused, and those out were recalled; this made money very tight and the buying capacity limited to a certain extent and amount, and consequently a sharp depreciation in the price of cheese resulted.

This state of affairs continued until August, when intimations were received that Great Britain had at last gotten rid of the load of old cheese which had been hanging over the trade there, and with a seriously diminished make in all parts of the cheese producing sections of the world, the question was whether they could get enough cheese to supply the unusual shortage, and from that time to the first of January, 1897, a steady export business was done at gradually advancing prices. The stocks of the world as then compiled showed a shortage of 150,000 cheeses, and with 250,000 boxes of "filled cheese" practically done away with, made an actual shortage of 400,000 boxes, while other estimates made it five to six hundred thousand.

The buying from the first of the year has been general and on a rising market, until now we have October twins quoted at 10 $\frac{1}{2}$ cents in Chicago, and with but few to be had even at that figure.

This brief summary of the past year's business I believe will show that we are on the sure and safe road to a return of the old-time prosperity in the cheese business, and it will only need conservative business methods this summer to realize my prediction.

The outlook for the coming year is for cheese to open high in May, and to be wanted by the export trade, and I would advise that cheddars be made until, say, the middle of July. If this course is carried out and prices kept at a steady basis, consistent with the relative prices of competing markets in Canada and New York, the make of May, June and July, which months make the surplus cheese, will be exported out of the country, and the fall make will be sold at remunerative prices to go to the domestic trade, which comes on in great volume in August, September, October and November. It is my belief that during the first three months of the this coming year's cheese season the factories now in operation will be unable to supply the demand for cheese from Great Britain, and I would urge and counsel all factory-men and creamery-men who are now hesitating and unable to decide as to which product to make, to make cheese.

My reason for advising to make cheese so strongly is that it is going to pay the patrons fully twenty-five to thirty cents per hundred more for their milk than butter. From the severe losses experienced by those storing butter last year, I do not think that creameries will be able to command the price they formerly did, through contracts made during the spring. If they are so situated that it is impossible for them to make cheese, I would suggest that they pack their butter in boxes for the export market, as Great Britain this coming year is going to buy large quantities of American butter, and although the style of package may seem odd, and the chances against disposing of the product packed in this manner, yet still I would be willing to guarantee that all butter put up in this manner will meet a ready sale, and sell at relatively higher prices than if packed in tubs.

Before closing this paper, I wish to say a few words for the Milwaukee Cheese Exchange. This institution was started last summer by several gentlemen interested in the cheese business, but owing to the unfortunate state of affairs in mercantile circles at the time of starting, they were unable to do as much business as they expected. Still I am assured that they are satisfied with the results, and from all I have heard, believe that those who consigned there were also pleased.

Right here I wish to say that I consider this exchange a good thing and should be encouraged, and that while they may not be able to secure the patronage of the factories making the finest cheese, still there are always those who, while not making the best, imagine that they do, and feeling sore on the buyers who wish to make a cut on account of the quality, think that if they sent their cheese for sale to this exchange, would be satisfied with the returns and be fully assured their cheese brought exactly what they were worth.

I wish to say that I have not the slightest interest in this concern further than as a buyer. I think there is room and need of such a market in Milwaukee. The cheese-factories in this state are mostly small ones and too widely scattered for a buyer to be able to secure the quantity he often has orders for. With such an institution ready to sell their product on reasonable terms, I think it would be a decided advantage to these factories not selling on regular boards of trade to send their cheese to this exchange to be sold.

DISCUSSION.

J. W. DECKER.—I believe that most of the makers here do not know what this exchange is.

MR. WHITE.—It was an exchange started by the sanction of the Chamber of Commerce in Milwaukee, for the sale of cheese.

J. W. DECKER.—They have a store house where the cheese is kept, and is it sold under the trier?

MR. WHITE.—Yes, sir.

J. W. DECKER.—Do they have daily auction sales, or how are they sold?

MR. WHITE.—They sell on commission.

MR. ADAMS.—The buyers objected to it or in fact the Chicago buyers objected to it. On what grounds I do not know, but they seemed to think irresponsible parties advocated the question, and that they would never get their commission. But there are some parties up there who are interested in that Board of Trade, and they thought probably they would be deprived of the business.

MR. WHITE.—I desire it understood that I have no interest in the thing at all.

MR. ADAMS.—I think if the Chicago buyers objected to it that was the best endorsement it could have.

PRESIDENT.—I wish to say a word here that I hadn't intended to say, as I was interested in the exchange; but I am not here to advertise my business. The idea of selling cheese in that way was to have the cheese shipped in there every week and have a regular sale day. The cheese was required to be lined up in proper shape, and it was sold under the trier to the highest bidder. The greatest trouble we experienced was in getting buyers enough. The only two buyers were Mr. White and Mr. Simon, both Wisconsin buyers. We never sold a cheese to a Chicago buyer in the three months we were there. We couldn't get but one to come there, and he wouldn't offer within half a cent as much as he would offer us at New Lisbon. They never gave any good reasons for not buying, except that it was too much trouble to inspect. I am not here to advertise our business, or anything of the kind, only I will say that we expect to start again when the cheese season opens, and we hope to get some more buyers. There isn't competition enough between Mr. White and Mr. Simon. They gave us fair prices, however, without competition. I will give them both credit for giving all the cheese were worth; and in fact Mr. White came there and was the only buyer, and gave all we thought the cheese were worth.

MR. J. W. DECKER.—Mr. White, in what shape should the cheese be put up for this English market; and what color?

MR. WHITE.—They should be a light straw color; not too high a color.

MR. J. W. DECKER.—Isn't it important that they should run just as even as possible?

MR. WHITE.—Yes, it is.

MR. J. W. DECKER.—Don't you buy some white cheese?

MR. WHITE.—Yes, we buy white cheese. It is best to stick to a colored cheese, then we will all be sure of a steady market for them.

MR. AUSTIN.—How early would you advise starting in the spring?

MR. WHITE.—As soon as you can make them.

MR. FAVILLE.—What did you say about putting up butter in your boxes?

MR. WHITE.—I said, use the Australian boxes. They are a box made from white or poplar wood, weighing about ten pounds and measuring twelve inches each way over the cap. They will hold fifty-six pounds of butter. It makes a very nice form to sell butter in. We send them across in refrigerator steamers, and when it lands there it is frozen solid; it is cut into pound pieces, and makes a very desirable package. And the English trade are now calling for that and are paying more for butter in that style, and I think there is going to be a steady demand, owing to the lack of butter in England.

Q. You referred to filled cheese not being made any more. Don't you think the skim cheese of Illinois took the place?

MR. WHITE.—No, they were made before.

J. W. DECKER.—Don't you think our market would be better off if we did not send any across?

MR. WHITE.—How are you going to remedy it?

J. W. DECKER.—In Canada they don't make any, do they?

MR. WHITE.—I don't know.

J. W. DECKER.—That is what they say, and they are getting the market because they don't put up anything but straight full cream cheese.

Q.—Do you have any difficulty with our common made boxes here; are they stout enough for shipping cheese?

MR. WHITE.—We never have any complaint about broken boxes. If buyers when they send cheese across will spike the covers well, they will go through in pretty good condition.

You can't get the boxes too heavy. I think the Muscoda boxes and Lone Rock boxes are the best made. The sections making the poorest boxes are at Port

Washington, Plymouth and Fond du Lac. They have very poor lumber, and make a very cheap, poor box.

MR. JOHNSON.—I would like to ask Mr. White if we use a heavy cap cloth, is it more preferable to grease them? Some buyers won't allow you to grease them at all.

MR. WHITE.—I think they will come all right without greasing them. It is my impression that where a heavy cap cloth is used, and where factories have greased them the rinds rot.

MR. JOHNSON.—I know a good many of them over there don't like to have them greased; but I have seen cheese where a heavy cap cloth has been on them for six weeks, and they have a perfect rind.

MR. WHITE.—Circles are used by some, and prove very satisfactory.

Q.—Would you leave them on?

MR. WHITE.—If they are to be shipped you can tear them off before shipping. The cheese will carry very well in cold storage with those circles on them.

Q.—If one were to get a light cotton cloth, a very light cloth, and leave them on there, would not it be better than those circles?

MR. WHITE.—It might perhaps; it would be just as good. In Canada they use very heavy cap cloth, and it reaches down the sides. They pull them off when they ship them and use them over again.

Q.—In Canada I understand they don't grease them at all.

MR. WHITE.—It would be a good thing if you could get cheese made uniform in quality and color. The only board that has been able to accomplish this is the Muscoda Board of Trade.

MR. VAN ELSTON.—We have laid a good deal of stress upon that point down there. The instructors who have gone about have talked it over at the board meetings that cheese should be made with uniform style. The instructor has had that point in mind, and has urged them all to have the cheese about the same color.

PRESIDENT.—They most always attend the cheesemakers' conventions, too.

MR. WHITE.—My experience with the cheesemakers up north is that although they make a very fine cheese individually, when you buy a cheese there they are not uniform. One will weigh 72 pounds and another will weigh 60 pounds in the same factory. They don't like it on the other side.

MR. JOHNSON.—Don't you think it would be a good idea if the different Boards of Trade, and all the rest of them, would shut up for one day, and all come together, and the instructor show them what he wants done?

MR. WHITE.—You would have the farmers out with their guns if you didn't show up that morning to make cheese.

MR. WHITE.—How many cheese instructors did we have last year?

A.—Two.

MR. WHITE.—Mr. Aderhold and Mr. Baer, I believe. Doesn't it seem to you as though the state of Wisconsin ought to have more than two instructors for cheese?

MR. ADAMS.—I think it would be a good idea if we could have an appropriation from the legislature. I advocated that in the Milwaukee Sentinel.

MR. FAVILLE.—I want to say in behalf of the Dairymen's Association—in behalf of the executive committee—that we have employed all the instructors that we could afford to; if we had more money we would want to put more men into the field.

MR. ADERHOLD.—There ought to be an instructor for every twenty-five factories at least. Under the present system the instructor feels under obligations to visit as many makers as possible, especially when everybody is having trouble. They all want him to come as soon as he can, and he cannot get around often enough. He could do a great deal better work, and it would be more satisfactory to himself, as well as to the makers, if he could get around to all often enough, so that he could see all or nearly every cheese that they make, on the shelves; but in a good many cases he does not see the maker after his visit for several months, and he may be doing unsatisfactory work all the while, where if the instructor would see him off and on, he could brace him up with explanations, and the maker do a great deal more creditable work.

MR. VAN ELSTON.—Two years ago in 1895, we made application from the

Muscoda Board of Trade for money. They appropriated us money, and we hired three instructors, and those three men went wherever they were asked to go.

MR. WHITE.—That is, in your own section.

MR. VAN ELSTON.—Yes, sir.

MR. WHITE.—You had good results from it?

MR. VAN ELSTON.—First rate.

MR. WHITE.—I think it was money well spent, and I think it would be money well spent if the state could be induced to appropriate \$5,000 a year to be placed either in the hands of the Dairy School, or in some association, to furnish instructors. I do not think we have enough.

MR. VAN ELSTON.—You have had cheese from that section; of course you know what they were; whether they showed that somebody had been there to tell the boys to get them all about alike and of uniform quality, or not.

MR. WHITE.—I think when the legislature is asked for the appropriation, it should be asked to hire competent cheese instructors.

J. W. DECKER.—Can this association ask the legislature for it?

Mr. White asked if it was his idea to put it in the hands of the Dairy Association. Mr. Monrad thought it would be better to put it in the control of the Dairy School. Mr. Decker suggested that the School and the Association were working together.

Mr. White suggested that it would be a good idea to have a motion made to that effect, a committee appointed to draw up the bill, etc.

The president thought it would be a good idea to leave it to the Committee on Resolutions.

MR. FAVILLE.—I have a suggestion to make in regard to this. The annual meeting of the State Dairymen's Association is next week, and we want some way to cooperate. I do not think there is anybody expects to make any money out of it, only to improve the quality of our dairy products. I think this association should adopt some resolution; I don't care how it comes, only that we have harmony of action, and let the matter come before the Dairymen's Association next week when we meet at Edgerton.

MR. WHITE.—Still, if this matter is endorsed it would be of some good.

MR. EVERETT.—Our association at this time has an annual appropriation. It is in the shape of an annual \$2,000; not in the shape of an appropriation. It has not become a law that we shall receive an appropriation; so I think it would be wise on the part of this Cheesemakers' Association to appoint a committee to cooperate with the Executive Committee of the Dairymen's Association in regard to this matter. I think perhaps that more might be accomplished in that way. Of course it would be well enough to pass resolutions perhaps, I think the cheesemakers are all in favor of it. If we appoint a committee of good men to confer with a committee of the Dairymen's Association, I think something will be done, and the law as it stands now might be changed and the appropriation doubled.

MR. WHITE.—I would make a motion that the president appoint a committee to meet the committee of the Wisconsin Dairymen's Association at their meeting next week at Edgerton.

The president put the motion, which was carried.

ADDRESS BY J. H. MONRAD.

I feel a good deal embarrassed, because it seems to me that we have covered the whole ground so thoroughly in the past sessions; and besides this, I really did not feel when I came out here that I had anything new, or anything worth while to say. Nevertheless I am always glad to meet with you, and am always glad to chip in and have my little say. There have been a few points brought out in this convention that I would like to emphasize. There is one thing that you boys must remember, in speaking of cheesemaking—or of anything else—and that is that when we try to speak the truth and nothing but the truth, we must of necessity repeat ourselves again and again, and the same ideas have to be repeated over and over again. Now, what struck me of all that Governor Hoard

said, as the most important point, was this: that "you have the power for good or evil." You are scattered over the state; you are the "lactic ferment" that we are sending out amongst the farmers. Now, a great deal depends upon whether that lactic ferment is in good condition, or whether it is tainted some way. You have a great power, not only so far as your immediate surroundings are concerned, but your influence may be far-reaching. Your own example in cleanliness teaches the farmers, silently, perhaps, but effectively, the value of cleanliness, that will in a short time spread to the neighboring factories. So you will see that you have a far greater power for good or evil than you had perhaps thought you possessed.

Now another point. The question came up, how to educate your patrons. I for my part think we have got to come out to the small meetings. These annual meetings we must have to stir us up, but we must have these smaller meetings, school-house meetings. The more I have thought over this matter, the more I see the necessity of starting from the very foundation, and that is good milk and cheap milk. That is where you have work, not only to teach them to take care of the milk but also to teach them how to produce cheaper milk.

I shall never forget what State Dairy Commissioner Adams once said when he declared it would be a blessing to Wisconsin if lightning would strike one-third of the cows. Of course at that time we may have observed that "lightning ought to discriminate a little." It is true. It would be a blessing. The farmers of Wisconsin and Illinois would be better off if one-third of the cows were struck by lightning. Now that is another point. That is, the cheapness of production.

Now I would emphasize the importance of your little school-house meetings. Try and get up some little attraction. If you have some good singer, or player, or other talent in the community, get up an entertainment, and get the young folks there. Get the farmer's wife there. They will then listen a little more to what you say about cleanliness. I think Mr. Aderhold struck the right key, and I think school-house meetings once a month is what you want to strike for; and that is a point that can never be emphasized too much. And then in these school house meetings it is my idea that what we want to show the farmers is that true cooperation is needed. Now, how is it at the present time? Mr. Aderhold runs a factory, we will say, and agrees to make up the cheese for so much. He guarantees the make. The farmer looks upon him and the factory as an enemy, and they don't care a snap as long as they dispose of the milk. You want to explain to them how it is that their responsibility does not cease when you have received the milk. That their responsibility has not ceased when Mr. White has purchased your cheese; that their responsibility has not ceased when you send it across the water, and that their responsibility does not cease until the cheese is consumed. Now, as soon as you can make them see that as sure as fate this comes back step by step and reduces the price of milk, then I think you can get them with you. It is very important that the farmers, the milk sellers, catch this cooperative spirit.

Now, I want to warn you against this moisture. We have our attention called to the question of moisture, the curing room, etc., and we have heard what the benefits were in the increase of yields, etc. I want to earnestly warn you against that. Take care and not put in too much water in the cheese. Referring to that, I would like to have had an analysis made of that cheese Governor Hoard showed here. I am not a betting man, but I would guarantee that there is 37 per cent. in that cheese. It was straight fat, Uncle Faville.

MR. FAVILLE.—That didn't make it soft, though.

MR. MONRAD.—No, that is right. Now another point we have touched on. It is like this in everything—we have got to have things in moderation. It is all right to be enthusiastic, but we want to be a little careful and not be too enthusiastic. When I was over in Canada the cheese buyers and instructors, one and all, stood up and denounced the use of starters, just as badly as the use of turnips, apples and grapes. Now I am a believer in a starter if used properly, but I say it is a dangerous weapon to put in the hands of a careless maker. There is the temptation of using too much. There is no use of talking—there is danger, and we must be on the lookout against that danger. There is no danger if you are careful to begin with. But you hurry; you have lots of work, and then before you know where you are your starter is a little off. And you simply dump in your starter. I have been in creameries where they complain of the quality of

the butter, and I immediately inquire about the use of a starter. I find they do use a starter, and so I go and smell it. I won't call it rotten, but it is often not far from it. In one case the maker called out, "How do you like it?" I was selling butter color at the time, and of course I had to be a little careful, and said, "I don't pretend to know much about it, but I don't like the smell." He came over and smelled it. "It is rotten," he said. I said to him, "Don't you wash that every day?" And he replied, "Oh, no, I have no time for that." There was a man who got into the routine and before he knew where he was he had a poor starter. And so you see there is need of working against those things.

Now, with even the curd test I think there is also some reason for warning you against danger. That danger is that you fool yourself and your patron by not having your bottles perfectly clean. They should be sterilized, in fact. If you don't have your bottles perfectly clean, or if you use the same knife each time without cleaning, you are running an enormous risk. That is another danger. You cannot be too careful to have the bottles very clean.

Then we have the danger of public demand. I cannot fully agree with Governor Hoard when he laid stress on Wisconsin's encouraging export trade. Our home market, I believe, will be the best; and yet there is danger of this always giving way to the public demand. We often get fooled by that. I remember of visiting one of the first centrifugal creameries. I noticed the maker was putting in water pretty liberally. He said they like it better. That was true. He had found by experience that they liked it better. Of course you will say, "That is all right." But in the long run I do not believe he would increase the trade; not in the long run.

There is the same danger in the making of soft cheese. I confess I don't know how we are to get over the trouble; but the soft, soggy cheese will not increase the consumption of the cheese. You want to get nearer the standard of the cheese shown us by Governor Hoard. I confess I cannot solve the problem, but there is the danger of going too far. The store-keeper tells you he wants a soft, mild cheese; but he does that because you have given him a cheese between that quality and a sharp, biting cheese.

Now there is a danger. You will say, "Well, I will try it." And you go home to your patrons, and you say, "I want to make such a cheese." Your patrons want the money. They want it for the milk. And so you will acknowledge the practical difficulties. Now there is one thing where I believe you ought to act as missionaries, and that is in getting more members. When you go home try to get your neighbors and cheesemakers together, even if there are only three or four of you. You can get up a good, interesting discussion. Get together regularly now and then, say once a month, and try to work in harmony with them. Get them interested. If they have not attended the dairy school, don't be too "stuck up." Don't show that too much. But you can get a great deal from the men who have not been in the dairy school, just as they can get a great deal from you.

Mr. Hoard spoke on the subject of instructors. They tried this last year in Canada. Beside the regular association instructors, there were four. They tried to organize what was called the "Syndicate System." The association paid, I believe, nearly all the expenses, and they enlisted seventeen factories. They had great trouble, but they induced seventeen factories to agree to join together in a syndicate to buy supplies, all together. You say there is one great step towards the desired uniformity. And they hired this maker. He had only seventeen factories to look after. I believe he could take twenty-five, as Mr. Aderhold says. It seems to me that there is a thing which your factories should take hold of a little themselves, but not too much. I believe in fostering industries, but I also believe that you as men should help yourselves a little. You ought to say to the government if you will pass a bill guaranteeing to pay half of the expenses, we will pay the other half. I throw that out simply as a hint. It would be a great deal easier to get the government to help you if you help yourselves a little. If you will join together, eighteen or twenty-five factories and buy the same supplies, hire a good man and tell him to go on and be your instructor. He need not be a better man than yourself. I don't care if he doesn't know a bit more than you do. He may see things that you can't see. You have been there day in and day out and do not see it, and he will come in and see it right away.

You know that to be the case. If the government don't help you, don't wait for the government. Chip in and get together; it is only an extension of your co-operation system. We want to get the factories to co-operate together; ship together and sell together.

Finally, there is only one thing that I want to touch on. I want to pay Professor King a high compliment. I think that he gave us a paper that if you will go home to your factories and just look on, use your senses, you will find that you can apply in one way or another what he showed us to be practical. Just as was said in this convention, the curing room is the first problem you have to solve.

DISCUSSION.

MR. ADERHOLD.—Did that combination of factories in Canada sell their cheese together?

MR. MONRAD.—As I understood it, they did. They bought all their supplies together; I know that sure.

Q.—They tried a year ago last spring to organize cooperative factories of twenty-five, did they not?

MR. MONRAD.—They hung back. They found it harder work than they thought. As I understood it they only got one syndicate started, but the success was such that they had hopes of getting all factories to organize.

MR. VAN ELSTON.—I think, Mr. Monrad, that the instructor finds a good deal of false pride among the cheesemakers. They think they do not need him and that it is against them if they have him. They think that the farmers will think they cannot make cheese, and the wrong view gets spread among the patrons of the factory.

MR. MONRAD.—That is the difficulty. And that is why I say this: Don't have that false pride. Many a time I know myself I have learned a great many things from outsiders, and it is the same with you. The instructor comes in, and that false pride shows itself. You think it is a sort of criticism on your ability. Why, some of the best engineers in the country are not ashamed of calling in a consulting engineer when they have a difficult job.

Q.—Do you think they ought to stand the expenses of an instructor? There seems to be quite a question among the makers and the factory-men who is to pay the expenses, whether the factory should pay it or the maker.

MR. MONRAD.—Well, it seems to me that the patrons ought to pay if they are the people who get the benefit. They know he has no interest in it and will be just by them. The only thing I criticize in Canada is that they let these instructors fool away their time in testing the milk.

MR. VAN ELSTON.—The farmers look at this in another way. They say, "We pay the cheesemaker \$50 or \$60 a month, and we suppose he understands his business; and if he doesn't, if he needs any help from outside, he should pay for it." They consider it is the cheesemaker that needs him and not them, while perhaps he is of just as much benefit to one as to the other. But I think if any cheesemaker is having lots of trouble, he can well afford to pay \$5 to an instructor, or to anybody that can help him out. If he can get it out of the patrons, all right, I should say get it if he can.

MR. MASON.—I am willing to give \$5 to get an instructor to come, but I don't know whether I can get him or not.

MR. VAN ELSTON.—The factories down in our country have always paid the instructor.

MR. SCHOENMAN.—A good many factories if they think they have to pay \$5 don't want the instructor. And it is pretty hard for an instructor to get around and make things come out all right. If he could commence at one end, and go around, it would save him lots of trouble. I know a good many factories in our section think they don't need any instructor, and then if they get into trouble, no matter if he is out forty miles, they call him in.

MR. MONRAD.—That is like some people who won't call in the doctor unless their child is pretty nearly dead.

MR. HALL.—It seems to me that is a question that will have to be settled between the patrons and the cheesemakers. It certainly is true that there are very few of the factories but what want and think they need more instructors, and the resolutions we offer will cover that.

MR. ADERHOLD then addressed the convention. He said:

Mr. President and Gentlemen: I feel myself under a disadvantage for two reasons: First, because the ground has been well covered, and second, because I am occupying the last position on the programme. I cannot see why the Programme Committee put me on the tail end, unless it was because they expected me to keep the flies off this convention. (Applause.) I am not going to make an address, because there is as much difference between me and a speaker as there is between the cow-slip and the milk-weed—speaking in the lore of my profession. However, I have jotted down a few conditions with which some of you may be least familiar.

NOTES ON CHEESE INSTRUCTION.

E. L. Aderhold, Neenah, Wis.

I simply wish to touch a few conditions with which most of you may be least familiar.

The negligence employed by many makers in the preparation of the starter is striking. One maker had a modus operandi of his own as follows: After all the milk was in the vat and warmed up to the setting temperature, he would mix in the starter, and refill the starter can with the mixture, and so on day after day. You will observe he always had part of the previous starter, as well as part of each patron's milk in all his starters. To make results more complete, he never washed his starter-can. Of course, his starters were literally rotten, and, I understand, the consequences were not lacking in the cheese. I found several makers who used whey starters, the preparation of which incorporates about the same principles described above. My experience is that if a whey starter is used for two consecutive days, the second starter will do considerable injury. I found two students who were using wooden paddles for stirring their starter milk, using them for months without renewing.

The lactic ferment starter is the best weapon I know of in fighting bad flavors in milk, and I am surprised its use does not increase faster. In September I stepped into the Dale factory and found them using 400 pounds of lactic ferment starter in 6,000 pounds of milk, and in flavor their cheese was superior to the average. They informed me they had propagated their starter for three months, at the end of which time the flavor was still good.

In no manner could a more extraordinary improvement be effected than by perfecting curing rooms. I will give my experience with two sub-earth ducts which differ in construction and results, and in describing them I will designate them as A and B. In A a box with inside dimensions of 8x12 inches, and 400 feet long, was lowered four feet. It has 1,333 square feet of inner surface. This duct cooled the air at first to 52 degrees Fahrenheit, but later in the summer only to 64 degrees F. The curing room floor was kept wet continually, and the moisture was kept at 80 degrees, or higher. There was no tendency of cheese to mold after the duct was in operation.

In B a ditch was dug 6 feet deep, 3 feet wide, and 100 feet long. The roof of this duct consisted of plank 3 feet above the bottom, supported by posts. This duct has an inner surface of 1,200 square feet. I cooled the air to 62 degrees F. As there is no wall on the sides and bottom the air becomes loaded with moisture as it passes through. I am sorry to note that the hygrometer at B did not register correctly, but the cheese exhibited unmistakable signs of greater moisture than the cheese at A. No water was used in the curing room at B, but there was some trouble with mold after the duct was in operation.

I have learned from numerous inquiries that the shrinkage of cheese held in common curing rooms is about 4%, and of those held the same length of time in cellar curing rooms, from 2 to ½%. With a perfect curing room we can save from 6 to 16 cents on every 100 pounds of cheese, in shrinkage alone.

The progress of the cheese industry is considerably hampered by the reluctance of makers to adopt improved methods. I explained the sub-earth duct to scores of makers, and while most of them thought it would be a grand improvement,

the idea of building one never entered their minds, and yet, if they undertook to build one, they would find it not so difficult after they got under way.

After the paper was read he proceeded temporarily as follows:

This is a mistake common to most of us. In considering a new undertaking, we are apt to allow ourselves to become hampered by anticipations of failure, which are often unfounded.

I will relate a little instance of that kind. A man one day was reading about a certain blind person who had such a delicate sense of touch that he could distinguish the colors of cloth by simply feeling of them. After he had read this he could not dismiss it from his mind. He kept thinking of it day after day, and after several weeks he was still brooding over the same question, and he didn't feel satisfied until he decided to try that himself, and see if he could learn it. He went to a dry goods store where they had all colored goods, and told them what he wanted. They blind-folded him, and brought goods of different colors to him for him to feel of. Now, naturally anybody would say that that man was undertaking an impossibility, but just let me tell you it was not but a few days until he got so he could tell when he felt "blue." (Laughter and applause.)

I want to expostulate a little more on the starter. This unusually heavy starter that I speak of—there are not many milks that will allow the use of such a heavy starter. It is something very unusual. They use four hundred pounds every day in six thousand pounds of milk. That was in September. But I want to say one thing in defense of the starter. The starter the last three years has been a great deal more necessary than it ever was previous to that, on account of the weedy flavors we have had in milk. Last summer I saw more floating curds than I ever saw before, and a good many of those curds would have been all right if they had got their whey off sooner. I found a good many curds that had a good flavor at ten o'clock, and from then on the flavor grew bad, and got so bad sometimes that the curd floated before they had acid enough to draw the whey; where if they had had a starter so they would have acid enough to draw the whey by half past ten o'clock, they wouldn't have noticed anything wrong with their curd.

MR. MICHELS.—I would like to ask Mr. Aderhold if, in his opinion, it would be just as well to use a common starter and use it in the same way as you would the lactic ferment? I would like to know what your idea would be in preparing a common starter, whether in the same way as we do the lactic ferment? I have tried it both ways and do not find much difference.

MR. ADERHOLD.—I have never had that question presented to me, but my first idea would be that it would improve the starter considerably. My second idea, that it would not be as good as the lactic ferment starter, with tainted milks; because I think it wouldn't control the development of acid and the flavor as much as the lactic ferment does. I have never seen a starter made of common milk that does control it as much.

MR. MICHELS.—What I had in mind was this, that if the cheese makers could go to work and prepare their own ferment in that way, I think it would be used by nearly every cheese-maker; where in this way they have to pay \$2 every three or four weeks.

MR. ADERHOLD.—I think if the cheese-makers had to prepare their own ferment, it wouldn't be worth much, and there is no use of paying \$2 for a new dose of it. Sixty-five or seventy-five cents' worth is just as good as two dollars' worth. That will enable him to make a starter, and he should use the whole of it at one time anyway. So what is the use of buying \$2 worth when 65 cents' worth will do just as well; and if there were a number of cheesemakers in the circuit, when one lost his starter, he would not have to renew it. He could borrow some. The expense is very light.

Q. I would like to ask Mr. Aderhold if this lactic is lobbered when added to the milk?

MR. ADERHOLD.—It always should be.

Q. Would you recommend putting in the home-made starter, providing it is a good wholesome starter?

MR. ADERHOLD.—There is a change somewhere that it oughtn't to be allowed to reach. I do not know where, exactly, but I think some time after the milk is lobbered. I think when milk lobbbers the acid is yet mild, and should be

used while the acid is yet mild. If allowed to set too long the acid becomes sharp, and then it is not as good. It affects the flavor of the curd.

J. W. DECKER.—How do you put in that lobbered starter?

MR. ADERHOLD.—Through a strainer or seive.

Q. I would like to ask Mr. Aderhold if he has ever tasted of this lactic starter, and the other?

MR. ADERHOLD.—Yes, sir, I have tasted of it many times. The lactic starter is milder than the other kind.

Q. I use about eighty pounds of a starter a day to forty-five hundred pounds of milk, and I use just this common starter. I take a can and fill it about half full of milk, and then in the afternoon dilute that with water and in the morning it would have a splendid flavor to it, and when put in the milk it would dissolve right in the milk. Have you ever tried that method?

MR. ADERHOLD.—I have tried that somewhat and have recommended others to try it to see how they liked it, and have seen some starters made that way that are very nice, and I think there is an advantage in hot weather especially, when the starter would be apt to go too far unless the acid was checked in some way.

MR. CARSWELL.—I would like to ask Mr. Aderhold if the starter has gone so far as to show why development in the starter, if that would not be detrimental to the cheese?

MR. ADERHOLD.—It would be detrimental before it got to that point.

MR. DECKER.—We carried on a series of experiments last year in the use of a starter. We tried the Hanson lactic ferment and others. The way we prepared the starters was to take pasteurized, or better, sterilized milk, and add a little of the starter to this new starter at a temperature of about ninety degrees. It varies with the temperature of the air, whether warm or cold weather, and we measured the amount of acid that was developed the next day when it was ready for use. If it stood too long it would get to be a tough curd. We found its point of curdling would be about 8-10 per cent. of acid. The starter would cool down to about 70 degrees. Now when it was added to the milk, we would pour warm milk through the seive. A little whey would probably go through in that way so that it does not leave the clots. The clots were left behind.

MR. ADERHOLD.—When milk clots like that it has been held too long. It should be so it would work through readily.

MR. DECKER.—Just when it comes to that point of curdling; then it is uniform, but if it stands too long, it will cause trouble.

MR. MONRAD.—That is just what I wanted to draw attention to. While I have not been using starters for cheese, I have had some experience in making starters just the same. And here is what I have learned: that as soon as it is coagulated, if you are not then ready to use it immediately, the thing is to chill that thing down as soon as possible, but to do it without disturbing it. If it wheys you will have a white curd and white specks in your cheese. But if you take that can and carry it out into the refrigerator carefully as you would a babe, and set it down gently so as not to disturb it—why, I have actually kept a starter in first class condition for twenty-four hours. And I believe this is the key to it, that you must not disturb that starter. As soon as it is coagulated, chill it down so as to stop the acid development that Prof. Decker speaks of.

MR. ADERHOLD.—That is the right idea. I have at times tried this with the common starter. If the ripening process was going on faster than I desired it in the evening I would add cold water to it and with good results.

Q. I would like to ask Mr. Aderhold if he would recommend a man to use this common starter when the milk material is good, and you are not likely to have any bad flavor?

MR. ADERHOLD.—There are times when he might not receive any benefit over that which he would from the old starter, the common starter; but there are times when he would, and it is very well for every cheesemaker to familiarize himself with the preparation of the lactic ferment starter.

I want to say this much, that in November, in cold weather, those who use the common starter have trouble, but those who use the lactic ferment starter get along just as nicely as at any other time.

MR. DECKER.—That is simply because you know what you have got when you use the ferment, and with the other you don't know what you have got.

MR. AUSTIN.—I would like to ask Mr. Aderhold what per cent. of acid in the starter would be too much? Could you get too large a per cent.—before it lobbered?

MR. ADERHOLD.—Not unless there is something abnormal about the milk.

MR. AUSTIN.—What per cent. after lobbered would be the tarting point?

MR. DECKER.—About 8-10 per cent.

MR. AUSTIN.—Would that be too high?

MR. DECKER.—No, that is about what it would develop. You can't develop a great deal more acid than that. I do not believe you can get over 9-10 per cent. acid.

MR. FAVILLE.—How long has this idea of a starter been prevalent among cheesemakers in Wisconsin? How long since they first got to using it generally?

MR. ADERHOLD.—I cannot say. The first that I really knew about it was when I attended the Dairy School here six years ago. Since then it has been used extensively.

MR. FAVILLE.—What is the advantage of a starter when you have good milk?

MR. ADERHOLD.—There is no necessity for a starter when the milk is good, except to shorten the time. But last summer I did not see much milk but what a starter would improve the cheese, if used intelligently. We have had so much tainted milk during the dry seasons. I expect next year it will be a great deal better.

MR. FAVILLE.—I can't see to-day where any benefit can come, and I can see where a great deal of injury will come from putting in too much starter in hot weather. Do you have to get milk sour before it is right? My trouble has always been in getting milk that was sweet enough. I didn't have to hunt around to get something to sour it. It must be a new demonstration, or something; I don't know what.

J. W. DECKER.—Mr. Faville has been telling us about the good cheese they used to have, and Mr. Faville has given us some good points. There were some discussions that came up last year, and Dr. Russell and I went home, and it led to a series of experiments. We developed some good points that will be published later. It was through the suggestion of Mr. Faville in the convention that we got the idea. So perhaps there are some things that Mr. Faville found out years ago that we do not realize to-day. I want to extend an invitation to Mr. Faville to come out to the school to-morrow or some day next week and show us how he used to make cheese.

WISCONSIN CURD TEST.

John W. Decker, Madison, Wis.

The first thing necessary for the manufacture of good cheese is good milk. Cheese is bad in two ways; namely, in flavor and in texture.

FLAVOR.—Bad flavor is produced in two ways; first, by high flavored feeds, such as onions, garlic, cabbages, turnips, watercress, etc., or by absorbing bad odors from foul air; and

Second, from germs that get into the milk and produce foul odors by their growth. All of these bad flavors in the milk will be carried into the cheese.

TEXTURE.—Cheesemakers have been put at their wits' end the past few years by gasy and floating curds. Such curds are produced by the growth of certain germs that produce gas in the milk and later in the curd. The gas collects in little cavities, producing the so-called pin-holes, and if there is gas enough produced before drawing the whey the curd will float.

All these conditions are produced by improper care of the milk. If the milk is cold when delivered at the factory the germs are dormant and the maker cannot detect their presence at the time, and consequently the milk is accepted as good. In cases where the maker guarantees his cheese this often works a great injustice to him. The Wisconsin Experiment Station has developed what is known as the Wisconsin Curd Test. With this test the maker is able to locate where bad milk comes from. It was used during the season of 1896 with good results. In a certain brick cheese factory the cheese would begin to puff up in about twenty-four hours from the time it was made. The maker guaranteed his cheese, but failed

to overcome the trouble and gave up the factory, and two other experienced makers undertook to operate it, but without any better success. I was then called in to locate the difficulty, if possible, and I suggested the use of the curd test.

There were thirteen patrons and the gas was soon located in the milk of two of them. A test was then made of each cow's milk, and finally it was narrowed down to three cows. The milk of these cows was kept out and there was no more trouble with gasy cheese. The test in this case saved at least three cents a pound on all cheese made after that time.

The apparatus for the test consists of the following things:

1. A set of sample jars, one for each patron, labeled for taking samples of milk. A lightning stopper pint jar is best, but a common Mason fruit jar may be used. The bottles should be numbered with paint or metal tags put on the covers, to distinguish between them.

2. A water-tank with a faucet in the end and lined with galvanized iron for holding the jars, and there should be a wire frame to hold the jars in place, otherwise they will topple over when surrounded with water. The tank should also be provided with a tight fitting cover to hold the temperature of the water around the bottles constant for a number of hours.

TO MAKE A TEST.

1. Take a sample jar about two-thirds full of each patron's milk.
2. Place the jars in the tank and pour warm water around them and let stand until the milk is heated to 98 degrees F. Do not transfer a thermometer from one bottle to another for fear of contaminating one sample with another.
3. Then add ten drops of rennet and shake to mix it well.
4. As soon as curdled firm, break up the curd with a case knife. Do not leave any large chunks of curd.
5. After the curd has settled pour off the whey. It is necessary to get a firm curd to have a good test, and the curd will not be firm when any large chunks are left, or if the whey is not poured off thoroughly.
6. When a firm curd has been obtained close up the tank, leaving water at 98 degrees F. around the bottles. The curd will ferment and in the course of six to twelve hours the bad milks can be located.
7. After the proper length of time has elapsed open up the tank and examine the curds. Take a knife and cut the curd into strips. If gas is present it will show itself.

Examine for Texture—

Is the curd solid?

Are there any holes?

Are these holes ragged or smooth?

Are there pin-holes?

Are there large gas-holes?

If the whey was not well poured off there may be ragged mechanical holes that are not the fault of the milk, and these should be carefully distinguished from pin-holes or larger gas-holes.

Examine for Flavor—

Work the curd up in the fingers.

Is it good?

Is it lacking?

Is it bad?

What does it resemble?

Curds will of course produce acid and may have a little sour smell, but it should be like rich, ripe cream.

8. Make careful, full notes of the test for future reference. Do not trust to your memory.

9. CAUTION.—As the bad conditions of milk are largely caused from germs, it will be necessary to use every precaution to have the apparatus clean and not contaminate one sample with another. The bottles should be thoroughly washed and then scalded with boiling water. I believe this test will fill a long-felt want of the cheesemakers.

TREASURER'S REPORT.

Mr. President and Members of the Association:

The following itemized report is made, showing the source from which all moneys paid into the treasurer's hands were received, and the disbursements paid on orders from the secretary, which I hold as vouchers.

RECEIPTS.

Cash on hand.....	\$68 13
Membership, 1896.....	32 00
From Butters & Peters.....	5 00
From Wisconsin Dairy Supply Co.....	5 00
From Cornish, Curtis & Greene Mfg. Co.....	15 00
From David Muir & White.....	25 00
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Total receipts	\$150 13
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DISBURSEMENTS.

C. A. Leicht, for printing.....	15 00
Jurgens Anderson, medals and express.....	6 25
C. A. Leight, for printing.....	15 00
U. S. Baer, Secy., express, postage and badges.....	4 00
J. A. Carswell, traveling expenses to Madison.....	5 00
C. A. Leicht, printing programs.....	12 00
A. H. Furstnow Co., medals.....	16 50
C. A. Leicht, printing entry blanks.....	2 50
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Total disbursements.....	\$63 75
Balance in hands of treasurer.....	86 38
	<hr/>
	\$150 13

Respectfully submitted,
 THOMAS JOHNSON, Treasurer.

The treasurer's report was submitted to the Executive committee and by them approved.

ANNOUNCEMENT OF SCORE AND PRESENTATION OF MEDALS BY THE PRESIDENT.

CLASS 1. MEDALS—GOLD, SILVER AND BRONZE.

Three Cheese Entry—June, August and October Make.

- First premium—Wm. Nesbit, Hub City, Wis.
- Second premium—Julius Berg, Madison, Wis.
- Third premium—Adolph Schoenman, Plane, Wis.

CLASS 2. SPECIAL CLASS.

Single Cheese Entry.

- First premium—Thomas Johnson, Boaz, Wis.

The following table shows score of all cheese exhibited:

CLASS 1.

Name of Exhibitor.	No.	Flavor	Tex-	Color	Make	Total
		45	ture	15	up	100
			30		10	
Wm. Nesbit, Hub City.....	1	44	29½	14½	10	98
Julius Berg Madison.....	2	43	28	14	10	96
Adolph Schoenman, Plane.....	3	40 1-3	26	12 2-3	9 1-3	88 1-3

CLASS 2.

Thomas Johnson, Boaz.....	1	44	29	15	9½	97½
Will Nesbit, Hub City.....	2	44	28	14½	10	96½
Wm. Zwickey, Van Dyne.....	3	43	28	14	9	94
John Carswell, Lone Rock.....	4	42	28	14	9½	93½
John Decker, Madison.....	5	42	27	13	9	91
Adolph Schoenman, Plane.....	6	40	27	13	10	90
A. C. Werth, Neenah.....	7	40	26	14	9½	89½
G. C. Bickel, Waterloo.....	8	42	26	13	8	89
W. H. Spooner, Madison.....	9	30	20	15	6	71

REPORT OF COMMITTEE ON RESOLUTIONS.

The committee on resolutions beg leave to submit the following resolutions:
 RESOLVED, That our representatives in congress are hereby earnestly requested to give their active support to the Grout Bill now pending in the United States Senate, which gives to the states full authority in the matter of regulating in original packages or not.

the manufacture and sale of imitation dairy products, whether such products are
 RESOLVED, That we heartily endorse the State Trade Mark Bill introduced in-to congress by Hon. Edward Sauerhering.

RESOLVED, That our secretary be and he is hereby instructed to send copies of these resolutions to each member of the Wisconsin Congressional Delegation.

RESOLVED, That we respectfully and earnestly request that ex-Governor Hoard appear before the Dairy and Food Committees of the House and Senate and ask said committees to prepare a bill creating the office of Wisconsin commercial agent, whose office shall be in some city in England and whose duty shall be to promote the sale of Wisconsin dairy products in England and other foreign countries.

WHEREAS, We, as cheesemakers of Wisconsin, recognizing the valuable work of the cheese-instructors sent out by the Wisconsin Dairyman's Association, through the work of whom our cheese has been of enhanced value and returned many times the amount of money to the farmers that has been so expended, be it

RESOLVED, That we petition our representatives in legislature assembled to increase the appropriation of the Wisconsin Dairyman's Association to five thousand (5,000) dollars per annum.

RESOLVED, That the thanks of the Association are hereby extended to ex-Governor Hoard for his kindness in securing the fine old Canadian cheese for our examination.

CASH CONTRIBUTORS.

David Muir & White, dealers in fancy cheese, Fond du Lac, Wis.....	\$25 00
Cornish, Curtis & Green Mfg. Co., manufacturers of and dealers in all kinds of dairy utensils, Fort Atkinson, Wis.....	15 00
Wisconsin Dairy Supply Co., cheese boxes and dairy supplies, White-water, Wis.....	5 00
Bulters & Peters, salt and lumber company, Ludington, Mich.....	5 00

MEMBERS FOR 1897.

Austin, E. E.	Boscobel
Austin, Bert.	Homer
Aierhold, E. L.	Neenah
Arkins, F. J.	Bowers
Alexandria, C. B.	Chicago, Ill.
Baer, U. S.	New Lisbon
Bender, F. J.	Boaz
Berg, Julius.	Ahnapee
Bickel, G. C.	Waterloo
Bruhn, Aksel.	Plane
Buschke, J. C.	Columbus
Bock, John.	Muscoda
Bremner, Charles.	Muscoda
Briggs, James.	Mineral Point
Biddulp, J. R.	Providence, Ill.
Bane, C. A.	Dana, Ill.
Boyd, R. M.	Racine
Brown, W. E.	Montford
Bothenbach, Jacob.	Arkerville
Cross, J. W.	Mauston
Carswell, John.	Lone Rock
Cross, Milo.	New Lisbon
Cosgrove, Thomas.	Boaz
Decker, J. W.	Madison
Driscoll, J. L.	Ironton
Dixon, W. C.	Madison
Dixon, Thomas.	Boaz
Didge, M. E.	Windsor
Dalley, B. H.	Milwaukee
Elmer, H. E.	Hussler
Ellefson, H. J.	Spring Green
Engelhaupt, C. F.	Amelia
Elston, A. C. Van.	Muscoda
Green, R. C.	Edgerton
Hauk, Edwin.	Dale
Homann, W. L.	Plane
Hansen, P. N.	Bakerville
Johnson, Thomas.	Boaz
Kepler, E. L.	Boaz
Kasper, P. H.	Nicholson
Kapelka, John.	Highland
Kachel, T. A.	Whitewater
Monrad, J. H.	Winnetka, Ill.
Mason, Peter.	Black Earth
Michels, Mat.	Calumet
McNamara, C. F.	Spring Green
Nisbet, William.	Hub City
Phelps, S. D.	Briggsville
Powell, J. K.	New Lisbon
Pheatt, H. D.	Milwaukee
Raffensperger, W. L.	Madison
Remmington, F. E.	Boscobel
Spooner, W. H.	Madison
Spooner, E. C.	Mineral Point
Schoenman, Adolph.	Plane
Stussic, G.	Madison
Stewart, W. A.	Little Prairie
Scott, E. D.	Milwaukee
Schafer, Bruno.	Muscoda

Timmerck, Otto.....	New Lisbon
Vater, Arthur.....	Plymouth
Warnke, H.....	Fond du Lac
Werth, A. C.....	Neenah
Winsor, G. B.....	Mauston
Wallington, Frank.....	Clarksville
Warner, J. A.....	Viola
Zwickey, William.....	Van Dyne
Ziemer, L. B.....	New Lisbon
Cornish, Curtis & Green.....	Ft. Atkinson



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Wisconsin State Ag. Society.
Transactions

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