



LIBRARIES

UNIVERSITY OF WISCONSIN-MADISON

Proceedings of the sixth annual meeting of the Southern Wisconsin Cheesemakers' Association held in the court rooms at Darlington, Wisconsin, Wednesday and Thursday, March 7 and 8, 1906. 1906

Southern Wisconsin Cheesemakers' Association
Monroe, Wisconsin: Times Printing Co., 1906

<https://digital.library.wisc.edu/1711.dl/7XZNVDJRBTLCF8K>

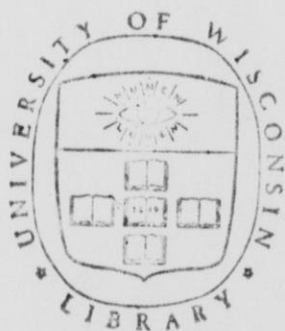
Based on date of publication, this material is presumed to be in the public domain.

For information on re-use, see

<http://digital.library.wisc.edu/1711.dl/Copyright>

The libraries provide public access to a wide range of material, including online exhibits, digitized collections, archival finding aids, our catalog, online articles, and a growing range of materials in many media.

When possible, we provide rights information in catalog records, finding aids, and other metadata that accompanies collections or items. However, it is always the user's obligation to evaluate copyright and rights issues in light of their own use.



AGRICULTURAL
LIBRARY



1077
8
6

no. 11-4
pub. *Large 5 + 29*
WHD has SK COLLEGE OF
UNIVERSITY OF WISCONSIN

MADISON

PROCEEDINGS OF THE

was 9/45

Sixth Annual Meeting

OF THE

7-24/47

1-4 Not Published (Serial 44)

Southern Wisconsin

Cheesemakers'

Association

HELD IN THE

Court Rooms at Darlington, Wisconsin

Wednesday and Thursday

March 7 and 8, 1906

Proceedings of the
SIXTH ANNUAL MEETING
of the
SOUTHERN WISCONSIN
CHEESEMAKERS'
ASSOCIATION

Held in the
Court Rooms at Darlington, Wisconsin

WEDNESDAY AND THURSDAY

MARCH 7 AND 8, 1906

Officers, 1906.

- President—JOHN LUCHSINGER, Monroe, Wis.
 Vice-President—CHAS. ZUERCHER, Brodhead, Wis.
 Secretary—HENRY ELMER, Monroe, Wis.
 Treasurer—JACOB REGEZ, SR., Monroe, Wis.
- Executive Committee.
- JACOB KARLEN, SR., Monroe, Wis.
 ALBERT C. TRACHSEL, Monroe, Wis.
 ALBERT POOLE, SR., Darlington, Wis.

Membership of the Southern Wisconsin Cheesemakers' Association, 1906.

A

Ackermann, J.	Monroe	Wisconsin
Alexander, C. B.	Chicago	Illinois
Aderhold, E. L.	Neenah	Wisconsin

B

Blum & Stauffacher	Monroe	Wisconsin
Blumer, Fred	Monroe	Wisconsin
Baer, U. S.	Madison	Wisconsin
Barlow, E. G. & P. B.	Darlington	Wisconsin
Bennett, Geo.	Darlington	Wisconsin
Bower, U. W.	Darlington	Wisconsin
Bruce, Bert	Darlington	Wisconsin
Bower, N.	Darlington	Wisconsin
Benedict Orville	Darlington	Wisconsin
Bothwell, W. A.	Darlington	Wisconsin

C

Callahan, Bros.	Darlington	Wisconsin
Conley, P. H.	Darlington	Wisconsin
Conley, E. F.	Darlington	Wisconsin
Carey, J. H.	Darlington	Wisconsin
Clark, L.	Darlington	Wisconsin

D

Dodge, Chas. S.	Monroe	Wisconsin
Dibble C. A.	Milwaukee	Wisconsin
DeMuth, Gus.	Darlington	Wisconsin
Driver, R. H.	Darlington	Wisconsin

E

Elmer, Henry	Monroe	Wisconsin
Elmer, John H. & Son.	Monroe	Wisconsin
Earle, T. H.	Darlington	Wisconsin

F

Figi, & Co.	Monroe	Wisconsin
Frehner, Carl	Darlington	Wisconsin
First National Bank	Darlington	Wisconsin
Francis, O. W.	Darlington	Wisconsin
Farrington, E. H., Professor	Madison	Wisconsin

G

Gilbank, Ancella	Darlington	Wisconsin
Grossman, J.	Darlington	Wisconsin
Greene & Van Matre.	Darlington	Wisconsin

H

Hawley, A. G.	Argyle	Wisconsin
Hansen, E. R.	Madison	Wisconsin
Hardiker, Frank H.	Chicago	Illinois
Hoskin & Wilson	Darlington	Wisconsin
Howery, L. B.	Darlington	Wisconsin
Hugill, Ed.	Darlington	Wisconsin
Halloran, E.	Darlington	Wisconsin
Hastings, E. G., Professor	Madison	Wisconsin
Hawley, Celia B.	Darlington	Wisconsin

	J	
Jally, H. L.	Darlington	Wisconsin
	K	
Karlen, Jacob, Sr.	Monroe	Wisconsin
Karlen, Jacob, Jr.	Monroe	Wisconsin
Karlen, Fred J.	Monroe	Wisconsin
Kelly, H. O.	Waterloo	Iowa
Kammer & Lory	Darlington	Wisconsin
Kiefe, J. H.	Darlington	Wisconsin
	L	
Lamb, L. L.	Monroe	Wisconsin
Lappin & Mc Connell	Darlington	Wisconsin
Lindsay & Howery.	Darlington	Wisconsin
Luchsinger, John	Monroe	Wisconsin
Luchsinger, Thomas	Monroe	Wisconsin
Lehnkering, C. F.	Darlington	Wisconsin
	M	
Monroe Lumber & Fuel Co.	Monroe	Wisconsin
Marti, Joe & Co.	Monroe	Wisconsin
Mueller, Fred	Darlington	Wisconsin
Meyer, F. M.	Apple River	Illinois
Meyer, Henry	Darlington	Wisconsin
Marty, Fred	Monroe	Wisconsin
Meehan, John	Darlington	Wisconsin
Miller & Riemer.	Darlington	Wisconsin
Martin, H. C.	Darlington	Wisconsin
Meyers, Sam	Darlington	Wisconsin
Murphy, J. E.	Darlington	Wisconsin
Mackin, Jno.	Darlington	Wisconsin
Micka & Huss	Darlington	Wisconsin
McKelly, R. C.	Milwaukee	Wisconsin
McGraw Bros.	Darlington	Wisconsin
McCarville, J. A.	Darlington	Wisconsin
McConnell & West	Darlington	Wisconsin
	N	
Nelson Hardware Co.	Darlington	Wisconsin

Orton & Osborn
 Oates, J. C.
 O'Brien, John
 Oates, Geo. F.

O

Darlington Wisconsin
 Darlington Wisconsin
 Darlington Wisconsin
 Darlington Wisconsin

Poole, A. & Sons.
 Palmer, C. F.

P

Darlington Wisconsin
 Darlington Wisconsin

Roth, Christ
 Regez, Jacob, Sr.
 Regez, Jacob, Jr.
 Rowe, Oscar
 Rothlisberger, Simon
 Ryan, J. W.
 Roy, J. B.
 Roberts, W. C.
 Roy, F. L. & Son
 Roselip, Gus.

R

Monroe Wisconsin
 Monroe Wisconsin
 Monroe Wisconsin
 Darlington Wisconsin
 Apple River Illinois
 Darlington Wisconsin
 Darlington Wisconsin
 Darlington Wisconsin
 Darlington Wisconsin
 Darlington Wisconsin

Schnebeli Edwin
 Stauffacher, Peter
 Stauffacher, Sam
 Schepley, Chas. R.
 Stoeri, Peter
 Schenk, Jacob
 Stauffer, Fred
 Skinner, David P.
 Steffin, Nick
 Schreiter, H. D.
 Swift, J. V.
 Schreiter, D.
 Steil, Geo. J.
 Sandefor & Metcalf
 Scott, H. E.
 Stevenson, G. W.

S

Brodh ead Wisconsin
 Monroe Wisconsin
 Monroe Wisconsin
 Monroe Wisconsin
 Monroe Wisconsin
 Mineral Point Wisconsin
 Blanchardville Wisconsin
 Darlington Wisconsin
 Milwaukee Wisconsin
 Darlington Wisconsin
 Darlington Wisconsin
 Darlington Wisconsin
 Darlington Wisconsin
 Darlington Wisconsin
 Darlington Wisconsin
 Darlington Wisconsin
 Darlington Wisconsin
 Argyle Wisconsin
 Darlington Wisconsin

6.

T		
Thaler, M.	Darlington	Wisconsin
Trachsel, Albert C.	Monroe	Wisconsin
Treat, Ben	Monroe	Wisconsin
Tarrell, R. E.	Darlington	Wisconsin
V		
Van Matre, R. E.	Darlington	Wisconsin
W		
Wenger, John C.	Monroe	Wisconsin
Wilson, Alex.	Darlington	Wisconsin
West, Geo. F.	Darlington	Wisconsin
Ward, Geo.	Darlington	Wisconsin
Werkenand Jos.	Darlington	Wisconsin
Winter, W. H.	Darlington	Wisconsin
Z		
Zimmermann, Fred, Agent	Monroe	Wisconsin
Zumkehr, Peter	Monroe	Wisconsin

Report of Secretary.

Henry Elmer, Monroe, Wis.

Mr. President and Members of the Association:

I beg to submit the following condensed statement for the Association Year just ended:

Total receipts	\$215 71
Total disbursements	63 75
	<hr/>
Balance in treasury	\$151 96

Itemized accounts of the receipts and expenditures are given in the Treasurer's Report. The Association Books of the Secretary and Treasurer are open for inspection at any time by any member of the Association.

We, as an Association can be proud of the good work that is done through our conventions, and the fruits of the labor done begins to show everywhere. Let the good work go on and on.

Treasurer's Financial Report for 1905.

Jacob Regez, Sr., Monroe, Wis.

Mr. President and Members of the Association:

The following itemized report shows the source from which all money paid into the Treasurer's hands were received, and the disbursements paid on order from the President and Secretary:

RECEIPTS.

Balance on hand from the year	
1904	\$ 95 71
Paid memberships	120 00
	<hr/>
Total	\$215 71

DISBURSEMENTS.

The Schwab Stamp Co.	\$ 23 60
Robert Kohli, for printing	10 00
Hall rent	15 00
Times Printing Co., printing	1 00
Jacob Mueller, cash prize	3 00
Emrick, for medals	6 65
Pres. Jno. Luchsinger, postage	1 00
Sec. Henry Elmer, postage	3 50
Balance on hand for 1906	151 96
	<hr/>
	\$215 71

Scales of Points for Judging.

Swiss and Block Cheese.

Flavor	35
Appearance on Tryer (holes) ..	30
Texture	20
Salt	10
Style	5
	<hr/>
Total	100

Brick and Limburger Cheese.

Flavor	40
Texture	40
Color	10
Salt	5
Style	5
	<hr/>
Total	100

Cheese Exhibit Rules.

At every convention there will be a fine exhibit of the various kinds of cheese made by members of the association. There will be awarded gold and silver medals, finely engraved with the winner's name and score for first and second prizes Swiss, Block, Brick and Limburger cheese. Every other exhibitor whose cheese scores over 92 points will receive a diploma signed by the judges and the president and secretary and share pro rata in a cash premium of \$30. Exhibitors must be members of the association and will be limited to one exhibit of not less than thirty pounds each. No cheese shall be considered for prizes that has previously been bored or cut. Entry cards and directions will be furnished by the secretary, Henry Elmer, P. O. box 623, Monroe, Wis., who will also send membership cards and badges upon payment of \$1.00 each. All marks or cards showing the ownership of the cheese will be removed upon entry. In no case will the name of any exhibitor be made known to the judges or others, until the award is announced. All cheese must be entered the first day the convention begins.

Address of Welcome.

Capt. P. H. Conley.

Gentlemen of the Southern Wisconsin Cheesemakers' Convention, to me has been assigned the pleasant and agreeable position of welcoming you to our beautiful city of Darlington. I know of no more pleasing position in which I could be placed, for I esteem the membership highly and know the good work you are doing.

No set of men in this part of the state have done so much for us. You have made the waste places glad, and have changed the whole face of the country. You have changed the worn out fields to grassy pastures and lifted the hard working mortgage from many a home. Let me assure you that the farmers of Lafayette County and the Citizens of Darlington appreciate the honor which is signified by your presence here.

I have wondered why I was chosen for this position because I can not tell the digerence between a Polled Angus and a Durham cheese. I think I can tell a Limburger by the smell, but even at that I might be mistaken. I sometimes think that the position was assigned to me for the same reason that the lawyers are asked to deliver addresses at county fairs—for the reason that the less they know about a subject, the more they can talk about it. Again I think that I may have been chosen for the reason that two years ago I spent part of the summer in Switzerland, and if you get as much pleasure out of this meeting as I got out of that beautiful country, you will go away well satisfied.

You have carried with you to this country the reputation you had at home for honesty and hard work and it is largely owing to these traits that you have made the cheese industry what it is.

One thing we can promise you is an unlimited supply of the best water in the world and this convention is famous for its use of that beverage. You will find it on tap here in

this room and I recommend it to you earnest attention.

We are new at this cheese business compared with most of the members of this convention and we hope to be educated, and we know that we will be much benefited by your presence. You will find our people hospitable, and if there is anything you want and don't see, ask for it—the freedom of the city is yours. We hope that you will carry away a kindly remembrance of your visit and we hope and trust that you will come again, as I feel certain that if you do, you will find a renewed interest and larger attendance.

Again in behalf of our people I bid you welcome and I assure you that nothing will be left undone for your comfort and I bespeak for the convention a very pleasant and profitable meeting.

Response to Address of Welcome.

By John Luchsinger, President.

Mr. Conley and Citizens of Darlington:

For myself and for the Southern Wisconsin Cheesemakers' Association I thank you most sincerely for your kind and gracious words of welcome. Such a welcome makes one feel at home, convinces us that we are among friends.

Neighbors and friends our interests are the same. Whatever may be of advantage and profit in this our annual gathering we gladly share with you, and hope that with the kind help of your own dairy and cheese men our sessions will be helpful to the great and growing cheese industry of Southern Wisconsin. I am well advised when I say growing, for I know your county, its soil, its grasses and its general fitness for the dairy business. I predict that in the not far away future your city will be the center of cheese production as truly as it is now the center of the splendid limestone hill country clad with rich everlasting blue grass and watered by springs and brooks in generous abundance, all so indispensable to good milk production. It is true that our great Swiss cheese industry originated in Green county, brought across the ocean 60 years ago by a cluster of poor Swiss immigrants who tramped their weary way on foot across your prairies from Galena to the land in Green county selected for them to settle on, but the greatest milk production has reached or nearly reached its limit there. Swiss cheese making is not successful in the low lying though rich meadow lands to the east of us, it attains its best on the great limestone hills and uplands that stretch from Sugar River westward in great waves of hill and valley to the Mississippi. South-western Wisconsin is, and always will be, the best milk producing section of the middle west, best in quality, and most abundant in production.

To develop and make the most of this choice gift of na-

ture it requires only the right kind of people. You have them, they are willing and eager to learn what must be learned to become successful milk producers. This association has come here to meet with them to talk of the best methods to pursue in all the many details of cheese production, to instruct and be instructed, to talk of the failures as well as the successes of the past and apply the lessons. My observation has been that in the matter of building cheese factories. Lafayette county people are no way narrow or niggardly, as a rule they will freely provide good, substantial, sanitary buildings and the best known equipments and this is especially the rule where new factories are being built. They are eager to do all in their power when they are informed of what is required, so that no blame may be thrown on them in case of failure.

I trust that every one attending our meetings will feel free to take an active part, especially in the discussions, for the very best thoughts are most often awakened and brought out in a free open talk. Again thanking you for your kind invitation and generous welcome we will now proceed to the business of the meeting.

Annual Address.

John Luchsinger, President.

Members of the Southern Wisconsin Cheesemakers' Association, Ladies and Gentlemen:

The time has arrived to open the proceedings and transact the business of the sixth annual meeting of our association. It is a great satisfaction to see on this first day of our meeting such a good attendance of members and others who are interested in your business. It is evidence that your efforts in the past to improve the conditions of your business, and of the product you make are watched with eager eyes, for in your business the city of Darlington as well as all of this section of Wisconsin take a lively interest. Everybody, not merely the cheesemaker and shipper, is affected by your success or failure. When you prosper so does every farmer, merchant, mechanic and laborer in the community. When for any reason you fail every other interest suffers loss. One of the great objects of your association is to reduce, if not entirely wipe out, the chances of disaster from bad workmanship, poor management, and oppressive conditions of every kind. What is impossible for any one or two to accomplish may be very easily done by an association of bright, earnest and expert men. Be it to cause the furnishing of better factories, and machinery, the employment of expert cheesemakers, the best methods of producing milk and converting it into number one cheese, the most improved ways of curing, marketing and shipping your product and the obtaining of fair and reasonable rates of freight from the railroads, in all things belonging to your great business your association has been a great power for improvement. You have been the means of introducing instruction by competent teachers into our State Dairy School in the making of Swiss cheese and other fancy varieties. You have but to make the request and the University sends its most skilled experts to ascertain wherein trouble lies. When for any unexplainable cause this or that factory is having disastrous losses, the state experts in-

investigate the source of trouble and be the fault with the patron or his cows, or with the cheesemaker and his methods it is impartially investigated and exposed, and the remedy applied. Only by such methods has it been possible to bring the quality of our Swiss cheese especially to the high degree of excellence and uniformity which makes it possible to hold and extend the demand for it so that it more than keeps up with the increased manufacture. That the percentage of less than first quality of cheese of all kinds made by us has grown less and less since this association has existed is a plain fact and each member who has given his best thoughts and brightest ideas for the benefit all has contributed to bring about the great good you have accomplished as a body and at the same time has received in return some other good thought and bright idea. Let no one who may be wiser than another miserly keep back from his brother his wisdom. Whatever he may contribute to better methods is sure to benefit himself in the higher reputation and consequent better demand and prices of the product of all.

We have a good program before us which will take up fully the time allotted. We have Professors Hastings and Farrington, Messrs. U. S. Baer, Aderhold, and Marty and others whose scientific and practical experiments and work has done much throughout our state to bring about the improved conditions in our industry.

We have also the equally useful because strictly practical papers and addresses of our and your best farmers, cheesemakers and dealers. All and each of these men will at the close of their addresses, give attention to and answer if possible any question in the line of their paper, and no information or explanation will be withheld no matter by whom requested. There will be a few papers in German for the benefit of those who may have difficulty in fully understanding English, and discussions in German will also be in order on those papers. So let us have open and free discussion on what so greatly affects the present and future of this section of Wisconsin, and when our sessions close every one who has taken part will say as usual, it has done me good to be here.

The Training of the Cheesemaker.

By U. S. Baer.

A complete revolution in cheesemaking has taken place in very recent years. This has been brought about: 1st, by introduction of the Babcock test for fat; 2nd, by the Wisconsin cured test, teaching a more definite knowledge regarding the various fermentations that so greatly influence milk and its products; 3rd, by the recent experiments in curing cheese at low temperatures; 4th, by the requirements of the markets for higher grade of excellence in cheese and the increasing public demand for pure, clean dairy products. All this has created a need in Wisconsin for educated cheesemakers; cheesemakers who are not only skilled in their profession over the cheese vat or cheese kettle and in the curing room or curing cellar, but makers of a broader education and caliber.

One of the greatest needs of the Wisconsin cheese industry is that of trained cheesemakers, capable of teaching the farmers the improved methods of handling stock, what and how to feed that stock with a view of securing economy in the production of milk, perfection in caring for it, and intelligence in marketing it, thus correcting the mistakes, uncleanness and disorder of careless and incompetent dairymen.

We need cheesemakers who can and will take the pains to show the patron that when he delivers tainted or sour milk to the factory it means a direct loss of dollars and cents to him and his neighbors associated with him. The business of cheesemaking, before we can attain the highest degree of success, needs a higher standard of intelligence among dairymen regarding the necessity of furnishing good milk in good condition for cheese making purposes. We need to be more careful in keeping our cheese factories and whey tubs in a clean and sweet condition, thereby setting a good example before the patrons. We need better factories, better makers, and higher ideals concerning cleanliness and otherwise good management in the factory. We need a more extensive and

closer supervision of all factories, so that instead of each maker feeling himself independent and unanswerable to nobody for the condition and management of his business, there shall be a union of feeling between all makers so that while each is independent, and striving as best he may to excel in his own factory, yet all are governed by the same general principles.

With regard to makers we find they are growing more teachable and more willing to advance; in fact we are finding them to be well trained and intelligent, with a large number of factories employing dairy school students who are doing themselves and their trainers credit by the work they are turning out. Yet we still find factories to criticise in their lack of cleanliness and slack method of keeping curing tables clean, and in their manner of looking after the floors, windows, walks and more especially the whey tank and whey barrels. All these things are the maker's business, and their neglect scores against his good reputation.

Every cheesemaker is to a certain extent responsible for the condition of his patron's milk. He should gain their loyalty, and in order to do this he should be well read and should thoroughly understand his profession. He must set himself as an example to his patrons by keeping his factory and factory surrounding in first-class shape. An up-to-date maker will not order the patron who brings a can of tainted or dirty milk to the factory to take it back to his hogs, without first using his brains in trying to educate that patron to properly care for his milk. He will tell the patron, as well as he is able, just what condition his milk is in and how it would effect the entire vat or kettle of milk and the product obtained from the same. He will explain further, showing him how in the end, his pocket book also will be affected.

He must interest himself in the matter, thereby interesting the patron, thus assisting him in righting the wrong. Where the makers goes at his patrons in this way they usually will willingly take back all milk that is unfit to go into cheese, and the cheesemaker's reward is sure and his reputation established. It is gratifying to note that the greater part of the cheesemakers are of a progressive nature

and seem to realize the fact that their business is one in which any circumstance tending to throw any additional light upon the work is not to be disregarded. However, we occasionally encounter that maker who has (unfortunately for him) reached the top round of the ladder, that is, he gives you to understand that what he does not know about the business is not of sufficient importance to admit discussion.

Recently I inspected a cheese factory which in its surroundings gave the impression that the swine had been making the pools of whey and slop water underneath the factory floors a sort of headquarters for some time. Filth had accumulated everywhere. The maker immediately began to complain of his milk supply, saying that his patrons did not keep their cans clean and that the milk was very seldom delivered in first-class condition. He gave me to understand that he had made cheese for nearly fourteen years and had learned how to make fine cheese from very bad milk, but he could not accomplish the feat with the rotten stuff such as he had been getting all the fall and winter.

In order that a maker of this stamp may rightly demand of his patrons that they bring their milk to him in good condition, he must first preach by examples. He must show that his factory is well kept in every sense, he must take more care of his personal appearance; wash his face oftener, also his hands and arms; clean his finger nails otherwise than in stirring cheese curds; change his work clothes, which in this particular case were disgustingly filthy. Then he must begin scouring and scalding at his reception porch, not forgetting the weigh can and scales; in fact everything that comes in contact with milk or curd must be thoroughly washed and dressed down with salt or lye. His factory doors, windows, walls, ceilings and floors must be in spotless condition. Then he must look after the outside; cleansing out the drain that carries off the water used for washing; clean up the whey tubs inside and out; shut up his neighbor's hogs; learn to be cleanly, orderly, active, quiet and civil.

Until he does possess these qualifications he has no just right to ask his patrons to clean up or supply him with good

milk. He can not expect to have sufficient influence on his patrons to persuade them that they should bring their milk in better condition than they usually do, unless he himself practices thorough cleanliness. I know of nothing more inconsistent than for a cheesemaker to scold and berate his patrons for having dirty milk cans and untidy surroundings, when the receiving can and floors of his factory are not perfectly clean. The cheesemaker himself should be a living example of cleanliness in all his surroundings. Nothing is more detrimental to the making of uniformly fine cheese than untidy cheese factories. Not only that which is outwardly apparent must be kept tidy, but every corner must be kept so, or the flavor of the cheese will tell tales of neglected corners that the eye does not perceive.

If the proprietors have good buildings, well fitted up, and the makers keep these establishments neat and in first-class order, then I assert that the cheesemaker has a just right to exact from every patron milk of good quality in every respect, and to refuse positively any that is not so. By acting differently they are unfair to those patrons who, attentive to their duty, bring only good milk, for these are made to suffer loss by the careless deeds of others. Milk is either good or bad; if it is good accept it and credit the patron with full weight; if it is bad, refuse it and do not practice the method that some makers follow by accepting more or less damaged milk on condition of deducting a certain percentage from its weight.

I have made use of the foregoing circumstance, not for the purpose of venting any ill toward any one, but to show forth the narrow minded meanness of those who have acquired that habit of shifting the responsibility onto others. They seem to be incapable of appreciating the noble, praiseworthy motive to raise if possible the industry to a higher plane of excellence, not for selfish purposes, but for the general good of the community and the consuming public at large.

Bovine Tuberculosis and the Public Health.

Address Delivered Before the Lafayette County Medical Society By H. E. Scott, M. D.,
of Argyle, Wis.

I am prompted to present this paper upon the subject of bovine tuberculosis because of my interest in it as a local health officer, and because I am associated with Dr. Roberts, State Veterinarian, Dr. Russell, State Bacteriologist, and Prof. Emery of the State Dairy School, in superintending the exomation, slaughtering and burial of the largest herd of tuberculosis cattle in the state.

The concensus of opinion of present day authorities is to the effect that the tubercular bacilli that effect the human system and those attacking domestic animals are identical in their growth, developments, the results produced upon tissues, and in their culture characteristics. To Prof. Koch most of our knowledge of tubercle bacillus and tuberculosis is due. Briefly, the morphological characteristics of the bacillus are: a short, fine rod, often slightly curved, with an average length of nearly half the diameter of a red blood corpuscle. Staining brings out a beaded appearance which has by some been attributed to the presence of spores. The bacillus grows on blood serum, glycerine agar and potato, but most readily on blood serum at body temperature. Its growth is slow, appearing at about the end of the second week in colonies that form thin, grayish white, dry, scale-like, masses on the surface of the medium. Successive inoculations may be made from cultures indefinitely and all will be found virulent.

Much discussion was aroused by Koch in his address on tuberculosis at the British Congress, when he maintained

that human and bovine tuberculosis were distinct entities and that the human could not be transmitted to cattle. He claimed that it was not yet proven that man was susceptible to bovine tuberculosis, but that he was nevertheless at liberty to say that if such a susceptibility really did exist, the infection of human being is a very rare occurrence. He emphasized this view in the following manner: "I should estimate the extent of infection by the milk and flesh of tubercular cattle, and butter made of their milk, as hardly greater than that of hereditary transmission, and I therefore do not deem it advisable to take any measures against it." Koch based his conclusions upon the failure to produce tuberculosis in cattle and other domestic animals by inoculating them with tubercular material of human origin, and his progress in causing progressive and fatal tuberculosis in the same kind of animals when inoculated with tubercular material of bovine origin. Following this announcement experiments were made by Hamilton, Smith and the German tuberculosis commission, and directly opposite results were obtained—their experiments proving that tubercle bacilli through the human animal affected cattle just as virulently as did bovine bacilli.

Martin experimented by feeding the sputum to six calves with the result that two showed no lesions, one 53, one 63, and two 13 tubercular nodules in the intestines. Experiments by Chauveau, are more conclusive; he fed and infected three cattle with emulsion made from tuberculous human lungs. In this case the different organs of the animals were affected and the virulence of all three cases was pronounced. The autopsy, made about 57 days after inoculation, revealed in one case 200 tubercles in the small intestine, also some in the cecum, colon and peritoneum. The two retropharyngeal glands were enlarged, and typical tubercular infiltration was found. At the same time three cattle were infected in like manner with bovine material, and at the autopsy it was impossible to distinguish any difference between the animals infected with the human, and those treated with bovine material. All were affected, and in all the tuberculosis lesions has the same characteristics.

From these experiments we draw the conclusion that human tuberculosis virus acts upon the bovine species exactly like bovine tuberculosis. Ravenel has recorded three cases of veterinarians whose hands were infected with tuberculosis in performing autopsies upon tubercular cattle. Typical tubercular nodules developed at the point of infection. These were excised and recovery was complete. In the fourth case, however, pulmonary tuberculosis developed and the patient succumbed to the disease.

Another interesting case of primary subcutaneous tuberculosis is that of a little girl, six years of age, who had suffered from an eruption on the left leg supposed to be due to ivy poisoning. This was treated at home by the topical application of cream. When it first came under the care of a physician, there was a painless ulcer of irregular shape, the size of a twenty-five cent piece, on the posterior aspect of the leg, having the characteristic appearance of a tubercular ulcer, with reddish tinged borders slightly overhanging the floor which was covered with the granulations and sero-pus. There were also a dozen light, mahogany colored spots confined to the calf of the leg and the lower third of the thigh, varying from the size of a hazel nut to half the size of a walnut, and containing masses of caseous material. The cow from which the cream was taken was examined and the udder seemed normal; yet inguinal and intraperitoneal inoculation of two rabbits with a mixture of this milk and cream gave positive results of both inguinal inoculations and one peritoneal. The caseous material from the nodules of the girl's leg, injected into the peritoneum of a rabbit, produced tuberculous peritonitis and death in three weeks.

Infection through milk. One of the many interesting cases, and the only one which I will cite, is that reported by Oliver: Twelve girls contracted tuberculosis at a boarding school; of these three died. From the fact that the sick and deceased girls were descended from healthy ancestors, and without question showed the phenomena of intestinal tuberculosis there was a suspicion of infection due to the food. Full confirmation of this suspicion was found after the slaughter of a cow which for a year had served as a source

of milk supply for the school. The cow had extensive tuberculosis of the intestines and udder.

In tuberculin we have found an unfailing means in diagnosing tuberculosis in cattle. Tuberculin is prepared by sterilizing, filtering and concentrating the liquids in which the tubercle bacillus has been allowed to vegetate. This substance has the effect, when injected into tissues of tubercular animal, of causing a decided rise of temperature, while it has no effect on animals free from the disease.

In testing a suspected animal the temperature is at first taken at intervals of about two hours, and a sufficient number of times to establish the normal temperature of the body under ordinary conditions of life. The proper dose of tuberculin about 2 cc., is then injected underneath the skin with a hyperdermic syringe. In tubercular cattle elevation of temperature is generally detected in from five and one-half to six hours after the injection, and reaches its greatest height from the sixteenth to the twentieth hour, then gradually subsides, reaching normal again by the twenty-eight hour. During the first of May a herd of seventy-two cattle in the town of Argyle were tested with tuberculin; in 69 of 72 a decided reaction was obtained. The state authorities demanded and conducted the destruction of these 69 head, and a complete autopsy was performed on each and every animal. Lesions of various degrees were found. In only one case which reacted to tuberculin no microscopical lesion was found, in others only the peribronchial glands were involved, but in some abscesses were found in the lungs, liver and stomach, vary from the size of a pea to that of a large potato. These organs as well as the intestines, peritoneum, and bladder were studded with the characteristic nodules of the disease. In most cases ulceration of the udder and mammary glands were found. At the same time twelve calves were slaughtered, varying in age from a few days to three months. In eleven of these no lesion were found and these were allowed to be shipped and used as food. This incident goes to show that the disease is not hereditary, but that the predisposition may be. In the twelfth and oldest calf which was suckled the longest by the mother, lesions were found in the

stomach, intestines and mesenteric glands, and this shows conclusively that the milk is the richest source of infection. After the burial of these cattle the premises were thoroughly disinfected by the removal of all debris, and by spraying the barn with a carbolic mixture—one gallon of the crude acid to a barrel of water—and whitewashing the interior of the barn.

In closing I would formulate the following conclusion:

First, that human and bovine tuberculosis are identical, are caused by the same germ, and are intercommunicable.

Second, that the disease may be contracted in three ways, ingestion of food, inoculation and inhalation.

Third, that the greatest danger to the human being is the consumption of infected milk.

The medical and veterinary professions have approached the problem of the relation of bovine tuberculosis to the public health with equal zeal, and much has come to light within recent years that enables them—at least, in a measure—to protect the human race, and it should be the urgent duty of authorities, owners and consumers, to join the medical and veterinary professions in their fight against the ravages of this disease.

What Is Lawful Milk.

E. L. Aderhold, President Wisconsin Cheesemakers' Association.

UNCLEAN AND UNSANITARY MILK.

Penalty for. [Section 4607, Statutes of 1898, as amended by ch. 138, laws of 1905.] Any person who shall sell or offer for sale, furnish or deliver, or have in his possession with intent to sell or offer for sale or furnish or deliver to any creamery, cheese factory, corporation or person, any adulterated milk or any adulterated cream shall be guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine of not less than twenty-five dollars nor more than one hundred dollars or be imprisoned in the county jail not less than thirty days nor more than sixty days.

Standard for pure; evidence. [Section 4607a, Statutes of 1898, as amended by ch. 138, laws of 1905.] In all prosecutions under the preceding section, or any other section of these statutes, or laws amendatory thereof or supplementary thereto, relating to the sale of adulterated milk or adulterated cream, the term adulterated milk shall mean: Milk containing less than three per centum of milk fat, or milk containing less than eight and one-half per centum of milk solids not fat, or milk drawn from cows within eight days before or four days after parturition, or milk from which any part of the cream has been removed, or milk which has been diluted with water or any other fluid, or milk to which has been added or into which has been introduced any coloring matter or chemical or preservative or deleterious or filthy substance or any foreign substance whatsoever, or milk drawn from cows kept in a filthy or unhealthy condition, or milk drawn from any sick or diseased cow or cow having ulcers or other running sores, or milk drawn from cows fed unwholesome food, or milk in any stage of putrefaction, or

milk contaminated by being kept in stables containing cattle or other animals. The term adulterated cream shall mean cream containing less than eighteen percentum of milk fat, or cream taken from milk drawn from cows within eight days before or four days after parturition, or cream from milk to which has been added or introduced any coloring matter or chemical or preservative or deleterious or filthy substance or any form substance whatsoever, or cream from milk drawn from cows kept in a filthy or unhealthy condition, or cream from milk drawn from any sick or diseased cow or cow having ulcers or other running sores, or cream from milk drawn from cows fed unwholesome food, or cream contaminated by being kept in stables containing cattle or other animals, or cream to which has been added or into which has been introduced any coloring matter or chemical or preservative or deleterious or filthy substance or any foreign substance whatsoever, or cream in any stage of putrefaction; provided, that nothing in this act shall be construed to prohibit the sale of pasteurized milk or cream to which viscogen or sucrate of lime has been added solely for the purpose of restoring the viscosity, if the same be distinctly labeled in such manner as to advise the purchaser of its true character; and providing that nothing in this act shall be construed as prohibiting the sale of milk commonly known as "skimmed milk," when the same is sold as and for "skimmed milk." Milk drawn from cows within eight days before or four days after parturition, or milk to which has been added or into which has been introduced any coloring matter or chemical or preservative or deleterious or filthy substance or milk drawn from cows kept in a filthy or unclean condition, or milk drawn from any sick or diseased cow or cow having ulcers or other running sores, or milk drawn from cows fed unwholesome food, or milk contaminated by being kept in stables containing cattle or other animals and cream from any such milk, or cream in any stage of putrefaction are hereby declared to be unclean and unsanitary milk or unclean and unsanitary cream, as the case may be.

Unclean and unsanitary milk. [Section 1, chapter 67,

laws of 1903.] Milk which shall be drawn from cows that are kept in barns or stables which are not well lighted and ventilated or that are filthy from an accumulation of animal refuse or from any other cause, or from cows which are themselves in a filthy condition, and milk in or from cans or other utensils that are not kept in a clean and sanitary condition, or milk to which has been added any unclean or unsanitary form substance, is hereby declared to be unclean and unsanitary milk; provided, that nothing in this act shall be construed to prohibit the sale of pasteurized milk or cream to which viscogen or sucrate of lime has been added solely for the purpose of restoring the viscosity, if the same be distinctly labeled in such manner as to advise the purchaser of its true character.

Sale of. [Section 2, chapter 67, laws of 1903.] No person, firm or corporation shall knowingly offer or expose for sale, or sell, or deliver for sale or consumption, or to any creamery or cheese factory or milk condensing factory, or have in his possession with intent to sell any unclean or unsanitary milk.

Manufacture of food from. [Section 3, chapter 67, laws of 1903.] No person, firm or corporation shall knowingly manufacture for sale any article of food from unclean or unsanitary milk or from cream from the same.

Premises and utensils to be kept clean. [Section 4, chapter 67, laws of 1903.] All premises and utensils employed for the manufacture or sale or offering for sale of food products from milk or cream from the same which shall not be kept in clean and good sanitary condition are hereby declared to be unclean and unsanitary. Any milk dealer or any person, firm or corporation furnishing milk or cream to such dealer, or the employe of such person, firm or corporation, who operates a creamery, cheese factory or milk condensing factory, or manufactures, reworks or packs butter for sale as a food product, shall maintain his premises and utensils in a clean and sanitary condition.

Cans, bottles or vessels to be washed. [Section 5, chapter 67, laws of 1903]. Any person, firm or corporation, who

receives any milk or cream in cans, bottles or vessels, which has be transported over any railroad, or boat line, where such cans, bottles or vessels are to be returned, shall cause the said cans, bottles or vessels to be emptied before the said milk or cream contained therein shall become sour, and shall cause said cans, bottles and vessels to be immediately washed and thoroughly cleansed and aired.

Penalty for violating either of the preceding five sections. [Section 6, chapter 67, laws of 1903, as amended by ch. 154, laws of 1905.] Whoever violates any provision of this act shall, upon conviction thereof, be punished by a fine of not less than twenty-five dollars nor more than one hundred dollars for each and every offense, or shall be imprisoned in the county jail not less than thirty days nor more than sixty days.

Cheese Industry and the Farm.

By Col. G. W. Stevenson.

What I shall say on this occasion will be from the standpoint of a farmer who has been engaged in general farming for some thirty years and knows the ups and downs as they occur to the man who has raised grain and stock for the general market.

For many years after the Civil war the masses emigrated to the western states and territories and opened the fertile western lands and become competitors to all who were engaged in the same industry nearer to the markets.

The results were such that for a long period of time farming was up-hill work and unprofitable. This depression caused the farmer to look for some avenue of escape from this western competition and over production; some change by which he could make his farm more profitable.

Creameries came into existence and were located in various localities of our state and the farmer looked favorably upon the scheme and stocked his farm with cows and patronized the creameries; the result was a move in the right direction, still the Mecca was not found. He had by this move taken himself out of the close competition of the western cheap lands, where corn could so easily be raised as to become cheaper for fuel than wood or coal, and a steer could be placed on the market for one-half the cost of production here. This competition put us out of the steer trade and for a time long held us down to the scratch line and our lands remained at a low value, but the farmer who kept cows and sold to the creameries, although receiving an unfair dividend for his capital and labor, was doing better, even handicapped as he was in the one-sided deal, than he could have done in the old way. He could feed the by-product to his pigs and make pork quicker and cheaper than by the old method. He could carry more stock on his farm, have more to return to his land and of better quality, So he was building up his farm in fertility instead of shipping it to Chicago.

The value of land has not disturbed his Rip Van Winkle sleep; he was only dreaming how he could make the old farm pay, that he might some day drive his bay colts to town in a rig as fine as the man in the city who had loaned him money for the past ten years.

In changes and evolutions of farming came the cheese factory. It heralded its coming in a way that there could be no mistake. If it was not visible to the eye, its malodorous odor proclaimed its presence. The farmer looked askance at the new order of things with fear and doubt, as to the feasibility of tackling an institution that appealed so strong and forcibly to his olfactories. The buyer of milk was on hand with his speech not unlike the book peddler or apple tree friend, and soon struck up a deal with the reluctant farmer at a range of price of about 50 to 60 cents per hundred pounds for his milk. "It was a trial trade only." The buyer of milk of all the first factories started had full control of the entire business and made most of the money in the enterprise.

A little schooling however, in the dairy business put the farmer in a position to see the importance of managing his own affairs, and now the business is rapidly falling into the hands of the patrons interested, where it justly belongs. In this section the industry found a footing in the eastern part of Lafayette county. It has grown rapidly and is now the chief and most important branch of farming. It has spread slowly westward until the county is well represented in the western half. It has and is now, a boom to the poor man, it has given employment to the laborer, has increased the railroad traffic, has added business to the city and has furnished ready money to pay the way of all who are engaged in the cheese industry.

Our section of the country is well adapted to the manufacture of Swiss cheese; it is the home of the blue grass and white clover, it is watered by the two Pecatonica rivers and clear cold springs of lime water abound and streams of living water are found meandering over pebbly beds and through green pastures making it the ideal dairy section of the west.

From evidence and experience before us at the present time we can form no other opinion as to the cause of the

great advance in land values, unless it is the dairy business. Merchants no longer carry the farmer a year on his books. The dairy industry furnishes the farmer with ready cash. The farms by reason of this cheese industry have become more fertile thereby giving the farmer more to sell, whereby he can improve his surroundings. The long wished for carriage is in his possession and he drives to town and is the peer of the best. This and more the dairy business has done for Lafayette county.

Although I have been a patron of a cheese factory for some years I shall not attempt to discuss its management here farther than to say, that the first and most important factor to success is the cheesemaker. If he fails to be skilled in the art of making and curing his product he can do you a great damage. Your season's profit may be swept away by his imperfect knowledge or his neglect in curing and caring for the cheese on the shelves.

Maintaining a proper temperature of the cellar is important and requires diligent supervision. A want of interest in the welfare of the patrons is often costly to those interested.

Mice often make a lodgment in the cellar and damage is done and a loss in price of the goods is the result. This pest should be carefully excluded.

Buyers often come to your factory, examine and run the trier into the cheese to note the quality without any intention of buying. This is a practice that should not be tolerated in a well regulated factory. Cheese on the shelves should in no case be mutilated until a grade price is determined between a buyer and seller. Then is the time to examine and try the quality of the goods. If this rule is adhered to a leak in the business would be stopped.

Bad or impure milk should in no case be accepted or milk from dirty, unsanitary cans taken at a factory. This duty of determining the quality of milk is in the hands of the cheesemaker and if he neglects to perform this important duty he is not competent to handle a cheese factory so as to return a profit to the company.

The building and surroundings and the cellar should be kept clean and sanitary. Disposal of the whey must be

managed so as to avoid bad odors. This the cheesemaker should control. Your cheesemaker should be regarded as a partner in everything pertaining to the business. He then will take an interest in the welfare of every patron and will do his best to turn out a good quality of goods that will sell at the top price. While he is making money for the company he is establishing a reputation which means money to him. Comfortable quarters should be provided, good wood furnished and the contract on the part of the company should be honestly and cheerfully performed. Then the cheesemaker can be held responsible for a violation of his part of the contract and trouble avoided which to often occurs in the cheesemaking business.

Handling and care of the dairy herd is just as important as making and caring for the cheese. Bad feed and stagnant water can produce only unwholesome milk and if the proper precautions in this respect are not taken with the dairy herd a loss is sure to result and is too often charged to the unoffending cheesemaker. Regular hours to feed and milk can not be neglected without loss in production and can not be recovered even if the change in time is but for a single day.

On my farm I use no stanchions; I stand my cows in stalls and tie with chains. The driveways are cemented and the cows stand on a plank floor raised about two inches above the level and are liberally bedded with straw which serves a two-fold purpose. It makes the herd comfortable and clean and absorbs the liquid waste and can be returned to the land.

I have no desire to inflict my methods of handling a dairy herd on others and have only briefly stated my way on some of the many points of the business connected with the cheese industry. With a careful study of a system of management of the dairy herd—their feed, the ventilation of the barn and the sanitary conditions of everything pertaining to the business marks the high way to success and whoever violates these general principles invites failure and disaster in the dairy industry.

Much as we have gained by this new method of farming, we hope to gain through the deliberation of this convention composed of a class of gentlemen who have given the sub-

ject much study of scientific knowledge and culture, whom we trust may illucidate and make clear and comprehensive the correct mode of managing and working the cheese factories of our country so as to bring profit to its patrons, the country and state at large.

I trust I voice the sentiments of the farming masses when I say our state has done nobly in advancing the interests of the farming public. The institutes and dairy centers are laboring to spread the gospel of better methods, instilling in the minds of our farmers principles, which are of untold value, educating and sending out our young men equipped for the stern duties of an agricultural career.

Gentlemen—We hope your coming and presence here may be fraught with success. And the impressions left at the close of this convention may bear fruit and that we can say that you have given us a better and clearer understanding of the great cheese problem, its failures, its needs, and its possibilities. That as farmers and dairymen we can work and labor more intelligently by reason of this exchange of views on an industry that in my opinion is the keynote of success of our farming public.

Swiss Cheese Making.

Fred Marty

Deputy Dairy and Food Commissioner

Swiss cheese making is the title of the subject assigned to me by your worthy secretary. A book perhaps could be written if we were to go into every particular detail of the manufacturing process of Swiss cheese. I am, however, only going to touch upon some of the effective wants and needs which we are today contemplating, and how these may be overcome.

Let us first consider of what value this foreign cheese industry is to our state. It means that southwestern Wisconsin is chiefly depending upon this industry; its yearly production consists of over 20,000,000 lbs. or \$2,000,000 worth of foreign cheese. Our cheese finds a constant market, and an Ideal Drum Swiss cheese is desired by the dealers and shows evidence that we are in need of a Fancy Swiss cheese, since there are annually over 85,000 cwt. Fancy Swiss cheese imported.

This cheese is of a fancy brand, but if we were to trace it back to its manufacturing point, we would find a cheese factory with a valuation of from \$10,000 to \$15,000, equipped with all the modern improvements. It is evident that many of our best cheese makers cannot manage their work in a satisfactory manner, due to the ineffective and poorly constructed buildings. After three years of study and inspection of the foreign cheese section, convinces me of the lack of equipment, and the necessity of putting forth every energy to improve conditions in this line of our industry. It is my desire to impress upon your minds this particular branch of cheese making.

The foreign cheese, including Swiss, Block, Brick and Limburger, is known as a sweet curd cheese, entirely depending upon the condition of the milk. The milk for a Swiss cheese dares not exceed over 12 per cent acidity in order not to destroy that characteristic nature of developing

the eye or holes in a Swiss cheese due to breaking down of milk sugar. The milk for Brick and Limburger cheese may contain a higher per cent of lactic ferment, but if over-ripe milk is used for either Swiss, Brick or Limburger, it will cause, when cured, a pin hole cheese in Swiss, and a sour cheese in Brick and Limburger, due to the large amount of moisture contained. A gassy milk is beyond control for either kind in our present method of manufacturing, yet many of the faults of our cheese may be traced back to poorly equipped factories and factory equipment.

It will be seen, therefore, that the lack of a Fancy Swiss cheese lies greatly in our poorly constructed factories. It has been shown that in the modern constructed factories where skillful methods can be employed, a very rare Fancy Quality is manufactured.

However, many faults I have observed are due to the maker who has not yet become master of the art. The manufacturer of Swiss cheese requires skill, judgment, yes years of practical experience, for an ideal Swiss cheese has many details, and is made up very defective under different temperatures in the curing process,—I mean to say it is so under our present conditions; we have no guide to go by as you Cheddar cheesemakers have. Many of these defects could be overcome by the use of the rennet and acid tests, to determine the ripeness of the milk, thus doing away with the home made rennet which is so uniform in its strength. The application of these tests would aid us in making a more uniform cheese, and if we can determine the point to which our milk should be ripened, a commercial rennet extract can be used.

This particular point of getting ways and means of controlling the ripeness of the milk and strength of the rennet at the time of setting the milk, would undoubtedly be a great aid to us.

The application of scientific tests along these lines has, in the manufacture of Cheddar cheese, worked wonders, and I am at a loss to see why the results would not be the same in our branch of manufacturing. But I think I am safe to say that it is evident that the question of ripening the milk

for Swiss cheese, will in time, belong to the past. It is evident that we are depending upon lactic ferment; the skilled judgment which is the secret of our maker, to obtain a uniform quality of cheese, will then be overcome. This would be a guide to the beginner and would not require years of practical experience to become master of this particular point. I do not mean that the milk for a Swiss cheese must be ripened to a comparative point as the milk for a Cheddar cheese, but it is evident that a large per cent of the Swiss cheese which is made in this state is classed as No. 2 cheese for the very reason that the milk from which these particular cheese were made did not contain sufficient lactic ferment to produce the proper fermentation necessary to develop the eye, or hole. The milk for a Swiss cheese is hauled two miles and immediately after drawn from the cows. This will not allow the lactic fermentation to develop to a high point; but it is evident that the ripeness of the milk in a period of six months will be influenced by the temperature of the atmosphere. I earnestly trust that this particular point will be considered by the authority of our station, and an experiment carried out in the regular factory plants, say one factory and location on high land, and one in low lands, where a record of each making should be carried out by the aid of a rennet test and acidity test, whereby each cheese could be compared by the record of manufacturing, and its final results.

I am much pleased to state that the condition of our factories are much improved, and strong efforts are being made to overcome that architectural plan of a Swiss cheese factory which was constructed so extravagantly of four posts and a roof. Let it be understood that we are not living in the time of our grandfathers; our circumstances today demand us to keep step with the times. The financial standing of our patrons today are not such that they can not comply with the state laws in maintaining a sanitary factory that would assure them higher returns of their product.

The map, showing the distribution of creameries and cheese factories will serve to show you that the cheese factories in our section have not only been drilled in one way, but

sowed down in full measure. These types of cheese factories are, with few exceptions practically of the same type, consisting of only from one to two curing rooms, which are in length 20 feet too short and in width 6 feet too narrow. It will not until then be under the Swiss cheese maker's control to guide the fermentation process of a Swiss cheese when three curing rooms are provided. Say, one room for salt brine tank and young cheese, second fermentation room with controlling heat temperature, third, storage room of somewhat natural lower temperature. This would greatly be appreciated by the skillful Swiss cheese maker which would give him control of the fermentation process, where at the present construction of a Swiss cheese factory of only from one to two curing rooms the cheese maker and the cheese is at the mercy of the surrounding temperature. Under natural condition the fermentations in a Swiss cheese varies greatly and can only be controlled where the cheese is placed under different temperature.

Let us hope that this particular point may be considered as many other improvements which has been accomplished by the co-operative efforts of the Dairy and Food commission and by those who have this industry at heart.

Some of the Causes of Inferior Cheese.

Prof. E. G. Hastings, Madison.

A considerable portion of the Swiss cheese made in our state each year is of inferior quality, due to abnormal fermentations. Through this cheese which must be classed as No. 2 or worse a large financial loss is placed upon those engaged in the production of milk and in the manufacture and handling of the cheese. This loss which can only be measured in thousands of dollars each year can in large part be prevented, if patron maker and dealer will make use of our present knowledge in regard to the production and handling of the milk and to the manufacture and curing of the product. In other words a part of the causes of inferior cheese can be overcome, can be removed, while another portion is undoubtedly beyond our means of control for our present knowledge in regard to these fermentations is far from complete, and until we know the cause of any trouble its prevention is well nigh impossible.

Of course, these causes of inferior and gassy cheese that can be prevented are the ones of greatest interest to us until we overcome those that can be overcome there is no use of worrying about those concerning which nothing is known. So today I simply wish to bring before you, very briefly, some of these preventable troubles that worry the cheese maker, and cause financial loss to the patron.

That the loss falls upon the patron is a point that should be emphasized, for until the patron can be made to see this clearly changes in the manner of producing and handling of milk which will be slow in appearing. In a large number of the factories of the district the milk is purchased at a definite price for the season. As soon as the milk passes the weigh-can the farmer thinks it is no longer of interest to him. The milk has been accepted, he will receive his money therefor, why should he be interested. This is the thought that passes through the mind of the farmer. Nothing can be more false than this for it is clear to everyone that the price of

milk depends upon the price of cheese, the price of cheese upon the demand, the demand in large part upon the quality of the cheese, the better the cheese the more will be used, and this finally reacts upon the patron in the shape of more dollars for a given quantity of milk. Again when contracts are made for the purchase of milk the buyer consciously or unconsciously, takes into account the losses he is likely to suffer through poor milk. If his experience with a certain set of patrons has been good, if he has been able to make from their milk a fine product, through a number of years, he will be willing to give more than if he had found that from the milk furnished, he was unable to make a No. 1 product constantly. This point cannot be discussed here more in detail, but it is evident to any one who gives it a moment's thought that all losses ultimately fall upon the farmer, hence it is of importance to him to produce the best milk possible whatever may be the way in which he is selling it, by contract or otherwise.

Two things go into the kettle of the Swiss cheese maker, milk and rennet. The kind of cheese obtained will depend almost wholly upon the quality of the milk and rennet, always admitting that the cheese maker is a man of experience, and makes and cures the cheese with intelligence and judgment. If the milk is poor the cheese is sure to be poor and the same is true of the rennet; poor spoiled rennet, inferior cheese.

For the way in which these raw products are produced and handled must be sought the causes of gassy cheese. It is often asserted by Swiss cheese makers that milk from cows suffering from udder troubles, inflammation of the udder, garget, etc., is often the cause of bloated cheese. undoubtedly this is true, for a number of the organisms causing inflammation are known to produce gassy fermentations. Such milk should be excluded from the supply for it is the product of a diseased udder, and as such is not to be looked upon as healthful food. Again it is believed that milk from cows suffering from digestive troubles is likely to cause gassy cheese, that sudden changes of feed from dry feed to pasture, spoiled feeds, are likewise often a source of

trouble. This unuoubtedly has a basis of truth for unwelcome as it may be to us, a large part of the bacteria that gain entrance to the milk come from the manure, even under summer conditions. With sudden changes of feed, with digestive troubles, come a change in the kind of bacterial life in the manure, and the result is often a gassy milk. The remedy here is not exclusion of the milk from the supply, but greater care in feeding, greater cleanliness in the production of the milk. The farmer should remember that he is the loser, and should use all care in the production of the milk.

While undoubtedly some of the gassy fermentations are due to milk drawn from cows whose udders are in an inflamed condition, that still others are due to the gas-forming bacteria that gain entrance from the manure, the great source of these obnoxious forms is to be sought elsewhere. It is to be found in certain practices common to the Swiss industry, namely in the method of preparing the whey rennet, and in the method of whey disposal.

The whey is returned to the farms in the same cans in which the milk is brought to the factory. On account of careless cleaning of the cans on the farms the milk is contaminated with the bacteric found in the whey. Even under the best conditions on the farm it is impossible to wash the cans so that a considerable number of germs will not find their way from the whey to the milk and where the washing is done in a careless manner the danger is greatly multiplied. Hence the condition of the whey, the kind of bacteria found in it is of great importance from the stand point of contamination of the milk supply. The condition of the whey depends largely upon the treatment it receives at the factory for the purpose of recovery of the butter fat.

A brief discussion of the present methods of recovering the butter fat is important in this connection. The hot process, formerly more used than now, is undoubtedly the best from the stand point of the contamination of the milk. The heating of the whey to the scalding point effectually pasteurizes it, the placing of this hot whey in the barrels or tank is equivalent to a scalding out of the same twice a day. Since

this whey is but 8-10 hours old when it is returned to the farms it has but little opportunity to be the seat of injurious fermentations, hence even though it is taken back to the farm in the milk cans it is not likely to contaminate them to any serious degree. Thus from the standpoint of milk contamination this process is far superior to any other, and it is to be regretted than on account of expense and the demands made upon the time of the maker, it has fallen into disrepute. The "cold process," the setting of the whey in tanks for 24 hours for the cream to rise is very bad from the stand point of the milk. For in order to have the acid fermentation necessary for the complete separation of the fat, it is essential that a small portion of the previous whey to be left in the tank, hence in practice the tanks are never cleaned out, often times during an entire season. If an abnormal fermentation becomes established in these tanks, it is propagated from day to day. The whey is, after remaining in the tanks 24 hours, and in an advanced state of fermentation, returned to the farms in the milk cans. The germs in the whey thus gain entrance to the milk and the cheese and a gassy product is often the result. In some factories where there has been trouble efforts have been made to remedy matters by the installation of a whey tank instead of the separate barrels. It is clear to any one who stops to think for a moment that such a move as this is absolutely without excuse of the cold processes of recovering the fat is used, for the whey as it comes from the tanks inside the factory is as bad as it can be, and a little additional contamination from unclean barrels can do it no farther injury. If tanks which are not cleaned out from one season's end to another are used inside the factory do not think you can overcome trouble by putting in a tank instead of barrels outside.

In many of the more progressive factories separators are being introduced for the recovery of the fat. There is an element of danger here for the maker having recovered all he can from the whey loses interest in it, and is likely to be neglectful of the conditions under which it is stored for the 8-10 hours before it is returned to the farms. If placed in dirty tanks or barrels this warm whey will be far advanced

in fermentation by the time it is carried back to the farm and may be almost as dangerous to the milk as that where the whey is set for 24 hours.

If dangerous organisms gain entrance to whey tanks or barrels and there set up their specific fermentations, there is a constant source of infection for the milk, through the milk cans, hence the fermentation is carried on from day to day.

With any method of recovery of the butter fat from the whey there is more or less danger. The only way in which it is possible to avoid danger from the whey is to use a separate set of containers for this by-product, the milk can to be used for milk alone. There is no valid objection against this plan for the milk furnished to the Swiss factories is drawn from a limited territory, each farmer drawing his own, the extra can needed for the whey can be easily carried, in the case of Cheddar factories where the milk is hauled in large loads to the factory the carrying of an extra set of cans would be a great inconvenience, but not so under the conditions obtaining in the Swiss district. If the patron can only be made to see the great financial loss he is bringing upon himself through this method of handling the whey, it is certain that a reformation would come and that at once. The makers are a unit in favor of this plan and it is their duty to educate their patrons until it shall be evident to the patrons that the carrying of whey in milk cans is a constant source of loss to them.

The sources of infection discussed have been those over which the farmer has immediate control. The farmer is not the only one that employs methods that are likely to cause gassy cheese. The maker is often at fault. One frequent source of trouble is the whey rennet. It is desirable that this represent, as far as possible, a pure culture of the lactic acid organisms. These are absolutely essential for the production of a typical Swiss cheese. The milk as it reaches the factory contains but few of this type, and the rennet furnishes the necessary supply. It is for this reason that rennet extract cannot be successfully used in the making of Swiss cheese. If the lactic acid organisms are supplanted

by gas producing bacteria, as frequently happens, the results are sure to be disastrous to the cheese. The injurious organisms may come from the dried rennets, or from the milk which has been contaminated from the whey. When the fermentation is once started in the rennet jars, it is likely to persist for the whey taken from the kettle is used in preparing the next day's rennet and further more, the jars even though well washed will retain enough germs to start the fermentation afresh in the raw rennet. A fermentation that is likely to occur in the rennet is such a one as has been described in Bull. 128 of the Wis. Exp. Sta., the causal organism being a yeast that ferments milk-sugar. This organism finds favorable conditions for growth in the whey tanks, where the whey is set for the fat to rise. From here it gains access to the rennet jars through the medium of utensils used about the factory, and through the milk supply. In several instances, beside the one described in the bulletin mentioned above, several outbreaks of gassy cheese due to bacteria fermenting yeasts have come to the writer's attention. In these the fault seemed to lie in the rennet solution, for a change to rennet extract at once caused the trouble to disappear. The rennet solution is more frequently at fault than is usually supposed. Investigation made by Von Freudenreich and others in Switzerland have shown that in a number of outbreaks of gassy cheese the trouble was due to the poor quality of the rennet solution.

The cheese maker should constantly test his rennet as to the presence of gas forming organisms. This can be easily done by the use of the "gas-probe" as employed by the maker in testing the patrons' milk. Two tubes should be filled with milk; to one tube should be added a few drops of the whey rennet, to the other nothing, if the tube to which the rennet has been added shows a gassy curd, and the control tube a good curd it is evident that the rennet is at fault. If both show gas, of course no conclusion can be drawn, and another test must be made, with a good sample of milk. The testing of the whey rennet should be a regular procedure in the work of the inspectors in aiding them in locating the source of troubles in the factories.

If the patrons will do their share in the production of a good quality of milk by rejection of all milk coming from animals which show any sign of udder troubles, by intelligent handling and feeding of the animals and by the use of separate cans for the carrying of whey to the farms, if the maker will pay as much attention to the way in which he prepares his rennet, as he does to the making and curing of the cheese, it is certain that gassy fermentations will be much lessened, that the strained relations that are to be found between patron and maker in so many of our factories will not exist, and that both will have a pocketbook that is "huffed" instead of the cheese.

How to Produce Milk at a Profit.

Orville Benedict, Darlington.

As far as I know there is no royal road to success in the dairy business. The milking machine is not yet in general use. In studying the cow census, taken in the several states we find in many instances the returns from the factory fall below the estimated cost of production. Something is wrong. Unless we, or dairymen, can market the products of our farms through our dairy cows, at the market price of these products, we had better quit the business.

We need to study all the details of the dairy carefully.

1st. We need a machine working for us, which will return the largest amount of milk and cheese for the food consumed.

We can buy a Deering binder or a McCormick mower with our eyes shut, and be reasonably sure that these machines will do as good work for us, as other machines of the same kind. With the dairy cow it is different. She may have the same form as her sister, she may have the same color and general appearance, but her ability to be an economical producer may be entirely lacking. This is an unseen power, and no man can judge the dairy cow accurately, only by the use of the scales and Babcock test.

Weigh the milk from each cow. If you do not care to weigh each day weigh one day in a week. At the end of the month make an average, and see how much she gave for that month. Continue this for the year and it is an easy matter to know, just how much each cow has brought you. Sell all that have not made a profit. I said yearly records. There is no room in a profitable dairy for the cow that comes in in May or June and dries up when the flies begin to bite. The dairy cow to produce milk at a profit must give milk 9 or 10 months.

Three years ago I began weighing the milk from each cow. I found that a cow that freshened in Sept. or Oct. would give from 2 to 3 thousand pounds more milk in a year

than an equally good cow that freshened in April or May. Let me say these were the results from dry feeds. I never have used ensilage. It is no trouble to get an ordinary dairy cow to give from 6 to 8 thousand pounds of milk in a year with reasonable feed and care. I said "dairy cow." There are many cows not worthy the name dairy cow.

How shall we get better cows?

1st. Use the best of dairy sires.

2nd. Save only heifer calves from the best cows.

3rd. Sell all that do not prove good milkers.

We may have the best of cows but if we do not feed and care for them wisely, we cannot expect a profit. The subject of feeds and feeding is the greatest subject before the American dairyman.

The cow need not be kept fat but she must be in a strong healthy condition all of the time. If she is to freshen while on dry feed she should be grained for two or three weeks previous. The feed at this time should consist of oats and bran, very little corn. If this feed is neglected no amount of after feeding will make her do her best for that season. As long as she is on dry feed it is safe to say she should have 1 lb. of mixed grain, consisting of bran, oats and corn, for every 3 lbs. of milk produced. In addition to the grain she must have a variety of good coarse fodder. All she will eat without unnecessary waste.

Variety amounts to a great deal. Beans are good but we do not want them three times a day, neither does a cow want hay, morning, noon and night. In the morning give her some nice bright corn fodder either cut or shredded. At noon some early cut oat straw. At night, mixed hay, mostly clover, cut early, before the stem becomes too woody and indigestible. Do not allow the cows to get any grass until they are able to get enough to keep them. They will lose their appetite for dry foods. Continue the grain for several days after they are out to pasture. Here she will be happy and give a large flow of milk until the hot July sun causes the pastures to become dry and barren. The flies come in swarms and poor bossy has to grab a mouthful here and there and spend nearly all the strength gained thereby in driving the little tormentors from her body. We must come

to her rescue with some kind of green food, in early variety of sweet corn or second crop clover.

From this time on until winter we can not depend on our pastures to provide suitable food to produce milk in paying quantities. Do not expect your cow to give milk on dry June grass. She will not do it.

Plow up a part of your pasture and raise large quantities of some variety of fodder corn.

With good cows, good feed, still you will not produce milk at a profit without giving the cow good care. She must have warm, well lighted, well ventilated barns. You can not turn a milch cow out of the warm barn at 8 o'clock every morning in winter and allow her to stand in the cold until 5 o'clock at night and expect her to give you from 30 to 40 lbs. of milk per day. She will not do it. She must be kept comfortable all of the time.

We are in the midst of a great Swiss cheese factory country. How to make the thousands and thousands of cows, whose milk is used during the summer months in the production of Swiss cheese, to bring greater profits to their owners in the problem before us. I will say, have these cows come in 1st of January. Sell the veal calf when the prices is almost double what it will be in May or June.

Have separators, either on the farm or establish skimming stations at your cheese factories, (I am not agent for Gasoline engine or separator Co.) Sell the cream to some butter factory for manufacture. Butter is usually high this time of year. The fresh skim milk is worth 15c per hundred to feed on the farm.

In the 4 months, Jan. Feb. March and April these cows should give, beside veiling their calves 2,500 lbs. of milk. This is a low estimate. This milk should make 4 lbs. of butter to the hundred, or 100 lbs. of butter. This should net you 20c per lb. or \$20.

These cows will go onto grass the 1st of May and give nearly as much milk as a fresh cow, and I believe just as good milk for the manufacture of swiss cheese.

What have we to the cow's credit.

Veal calf 125 lbs. at 7c	\$ 8.75
100 lbs. butter at 20c	20.00

Value of skim milk.....	3.75
4000 lbs. milk for Swiss cheese at 85c.....	34.00
	<hr/>
Total.....	66.50
Subtract from this the cost of grain.	
20 days before calving at 5c.....	\$ 1.00
120 days to the 1st of May at 8c.....	9.60
	<hr/>
Total grain.....	10.60

\$66.50—\$10.60—\$55.90. Figure for yourself the cost of roughage. If these methods are followed I am sure we can produce milk at a profit.

How to Produce Good Cheese.

W. A. Bothwell, Darlington.

The successful cheesemaker of the day must not only have a thorough knowledge of the art of cheese making but his knowledge must extend to the production and care of milk. He should be genial in manner and possess great tact and judgment that he may advise and instruct his patrons, as occasion may require without giving offense thus securing their confidence and co-operation.

It is our purpose in this article to deal particularly with cheesemaking in detail, but the requisite of good cheese is pure milk of good quality and as this can only be obtained from healthy cows with proper surroundings we will leave the cheesemaker for the present and begin with the farmer.

The day has gone by when the only qualification a farmer needed was plenty of muscle and application when his social standing was estimated by how willingly he seized the big end of the log at the logging bee.

All this is past and as civilization advances and population increases and the natural fertility of the soil is reduced it becomes more and more necessary that the farmer should be an intelligent, well read man. While muscle is still a desirable quality application and brains are what tell in the end.

And as dairying or mixed farming is the best means of keeping up the fertility of the soil the successful farmer must be a successful dairyman.

No farmer can order the climate to his liking and few can have their farms located as they wish or the kind of soil they most desire. He must be able to adapt himself to circumstances as no set of fixed rules will apply to every farm. If his land is high and dry it will be necessary to provide green crops for his stock in summer. If low damp soil which produces abundance of grass it may not be necessary or profitable to do so. If there is pure running water so much the better. If not it should be provided by means of tank and wind mill as dairy stock should have free access to pure water.

Bad water will affect the health of the animal as well as the quality of milk produced. It is a safe rule to never allow or compel your stock to drink water which is unfit for human consumption. Stables should be warm and light with plenty of space and good ventilation. The mangers should be fitted with water buckets and pipes so that stock can be watered without leaving the stables in cold and stormy weather. In breeding or selecting a dairy cow it should be borne in mind that she is simply a milk producing machine and the object is to secure the one that will produce the most and best quality of milk with the least expense. Do not keep a poor cow. Weed them out or they will consume the profits of the good ones. The kind of food to use will have to be determined by the cost of production in the locality. Turnips or anything that will injure the flavor of the milk should not be fed. The food should be of good quality and while we advise liberal feeding care must be taken that the cost of food does not exceed the benefit derived from it. Many a farmer who is a liberal feeder and whose herd produces a large flow of milk is a loser in the end through his lack of knowledge of the milk of fat producing qualities of the food consumed. The feeding of dairy cows is too large a subject to be dealt with here but every farmer should study the matter for himself by practical experiments and reading of dairy papers.

The dairy cow should have full access to salt. She should be handled in a gentle manner. The use of dogs for driving cows should not be permitted. Anything that excites the cow reduces the quantity and injures the quality of the milk. Milking should be done at the same hour night and morning and by the same person. A soft cloth should be used to remove any dirt that might fall in the milk pail.

Wetting of the udder should be avoided. Great care must be taken to keep all dairy utensils perfectly clean. After using they should be washed, with warm water then scalded with boiling water. Whey from factory should never be put in milk cans. Milk should be aerated and cooled to the temperature of the atmosphere and kept away from bad odors arising from hog pens or any other

foul matter and should be delivered at factory early in the morning. Next in order is the factory which should be in a central location and be supplied with abundance of pure water and good drainage. It should have solid foundation perfectly tight hard wood or cement floor with proper slope and gutters for carrying off whey and water. The walls should be double with air space between and have double doors and windows. It should be equipped with modern utensils and machinery. The boiler should be large and well bricked in and plenty of space in boiler room. And if engine is used it should be in separate room. The curing room should be supplied with steam heat also with means for cooling in hot weather either by ice chamber overhead or the cold storage plan or sub earth duct or other modern methods as the temperature of a curing room should always be subject to the will of the cheesemaker.

The whey tanks should be elevated and have water and steam pipe connections and should be thoroughly cleaned at least once a week. We will now return to the cheesemaker. Taken it for granted, that he thoroughly understands his business it is also very important that he should be honest, cleanly, careful and thorough in all his work. There is more cheese spoiled by neglect and carelessness and the desire of the cheesemaker to hurry the process than the lack of knowledge. He would give his personal attention to weighing and testing of all milk and reject any that is not in proper condition.

Many farmers have the opinion that any milk which is not sour is fit for cheese. This idea should be speedily removed by the cheese maker rejecting all gassy or ill flavored milk. Steam should be turned on the vat while milk is being received so that the temperature of milk will be 86 degrees by the time the vat is full. A rennet test should than be made to ascertain the acid conditions of milk. If found to be too sweet a starter should be used to develop and care being taken to have the proper kind of starter. Never use starter before rennet test has been taken unless weather is cold and milk known to be very sweet. If milk is of good flavor and and will set in from 20 to 30 minutes without the use of a starter it is advisable to wait. But if milk is bad

or gassy a good flavored starter will improve it. If colored cheese are made the coloring may be added any time after weight of milk is known. Rennet test should be taken very frequently or milk may become over ripe. It should be ripe enough before the rennet is added as to be ready to dip or remove the whey in two and one half hours with from 1-8 to 1-4 inch of acid by hot iron test. In spring when quick curing cheese are required use from 3 to 5 oz. of good rennet extract for 1000 lbs. milk and 2 1-2 to 3 in summer and fall. Stir the milk thoroughly for about 3 minutes after adding the rennet. In the spring it should start to coagulate in about 8 minutes and ready to cut in about 20 minutes and in summer about 30 minutes. In cutting the curd care must be taken to cut it even and not bruise or break it as this allows the butter fat to escape and will reduce the average. Cut first with the horizontal knife and then crossways with the perpendicular then lengthways with the same. Stir carefully by hand for about 15 minutes before turning on steam then heat slowly to 98 degrees keep it well stirred while heating and also for about 15 minutes after steam has been shut off. Stir quite frequently afterward to prevent curd from matting on bottom of the vat. When curd shows 1-8 of inch acid by hot iron test or 1-4 in summer draw off the whey and if sink is used dip the curd into it and stir until quite dry. When dry enough pack it about 5 inches thick in end of sink or vat as the case may be and allow to mat. As soon as it will adhere together cut in strips about 5 inches wide and turn over. It should be turned every few minutes and if moisture is well removed it may be cut crossways and piled two or three deep or even higher. When it becomes flaky and shows from 1 to 1½ inches acid by hot iron test put through curd mill. Stir for about 15 minutes after milling and every few minutes until ready to salt, which will be as soon as it becomes mellow and fine in texture and if a smooth appearance something like newly made butter.

Use about 2 lbs best dairy salt in spring and 2½ to 3 pounds in summer, to every 1000 lbs milk. Salt must be free from lumps. The best plan is to salt with a sieve and apply about 1-3 of the amount then stir then add another 1-3 and stir again then add the balance and stir well. Allow

temperature to lower to about 80 degrees and put to press about half hour after salting. Cheese should be made of uniform size. This can be done by the same, partly fill all the hoops or better still by weighing the curd put in each hoop. Press lightly at first, and when whey flows freely let them stand a few minutes and then press again. Repeat this every few minutes for one hour. They will then be ready to bandage. The bandage should be of proper length so that there will be one inch turned over each end of cheese.

Cheese should be turned in the hoop in the morning to give a better finish. Cheese should be left in press until hoops are required next day. The proper curing of cheese is very important and requires a great deal of attention. The curing room should be at a temperature of about 65 degrees. The cheese should be turned over every day until they are at least two weeks old. The curing room should be moist but not enough to cause mold on cheese.

When preparing cheese for market weigh carefully and mark the weight in plain figures on the box. Close only boxes that properly fit the cheese and cut down top of box about 1-4 inch below surface of cheese so that the lid will rest on the cheese. This will prevent the breaking of boxes in shipping or when cheese is piled high on top of each other.

Oil cloth covers should be provided for wagons while delivering cheese to shipping point so that they may be kept clean and dry. No article of this kind or any set of fixed rules can ever make a successful cheesemaker. He may have long practical experience, quick judgment and good common sense for as the condition of weather and milk varies from day to day he must vary his methods to meet the conditions. But before closing we would advise when acid or over ripe milk has been received to set at lower temperature and use more rennet. Cut curd finer, cook faster and higher and dip as soon as curd is firm enough to permit and stir drier. It is some times necessary to wash curd in sink to remove acid whey. This can be done by pouring over it water which has been heated to about 100 degrees and stir well. Mill early and use more salt and allow it to stand one hour or even longer before going to

press.

For gassy milk use more starter than usual and do not cook quite so high as the more moisture there is left in curd the faster acid will develop and kill the gas. Stir and air well after milling and give more acid before salting.

In conclusion I would say accept only good milk for the old saying still holds good "An ounce of prevention is worth a pound of cure."

Einige der grössten Nothwendigkeiten in Käsereien.

Henry Elmer, Monroe.

Werther Herr Präsident, sowie geschätzte Versammlung!

Es ist mir dieses Jahr sehr schwer geworden, ein passendes Thema zu finden, das ich dieser werthen Versammlung gegenüber einigermaßen zufriedenstellend hätte behandeln können.

Nach längerem Hin- und Herfinnen gelangte mir zufällig der vierteljährliche Bericht unserer Milchwirthschaft- und Lebensmittel-Kommission (Dairy and Food Commission) in Madison, Wis., vom 1. October bis 31. Dezember 1903 in die Hände, und da kam ich beim Durchlesen des Berichtes der Käserei-Inspektion auf den Gedanken, über genanntes Thema einige Bemerkungen zu machen.

In dem Bericht wird angegeben, daß vom 1. October 1903 bis zum 28. Dezember 1903 75 Käsereien inspektiert wurden; von diesen 75 Käsereien liegen 31 in Green County, 12 in La Fayette County, 3 in Iowa County und 2 in Dane County, im Ganzen 48 Käsereien, mit denen wir uns näher beschäftigen wollen, indem die übrigen 27 Käsereien für uns zu weit abliegen.

Von diesen benannten 48 Käsereien sagt der Bericht unter Anderem Folgendes:

Von allen 48 Käsern, die die Milch auf diesen 48 Käsereien verarbeiteten, war kein einziger, der einen Kurs in der Versuchstation unserer Milchwirthschaft zu Madison durchgenommen hatte. Wie ich alle die Namen nachsah, so meinte ich, es könne nicht möglich sein, daß ich nicht Namen finde, wo es heißen würde, der und der habe einen Kurs durchgemacht, aber leider konnte ich keinen einzigen Namen finden.

Alle 48 Käsereien hatten keine Babcock Milch-Probe, 43 Käsereien hatten keine Gähr-Proben (Wisconsin Curd Test), 4 Käsereien hatten ausländische Gähr-Proben, und eine einzige Käserei hatte die Wisconsin Curd Test. Keine einzige von allen 48 Käsereien hatte weder Fliegthüren noch Fliegenfenster.

24 Käsereien hatten den Abzugs-Graben für Ablaufwasser in ziemlich guter Ordnung. 20 Käsereien hatten schlechte Abzugs-Gräben, 3 Käsereien waren sehr schlecht damit bestellt, und eine Käserei hatte

fogar gar keinen.

(Ich weiß nicht was schlimmer ist, ob sehr schlecht oder gar keinen.)

8 Käseereien hatten die Molken-Fässer in ziemlich gutem Zustande, 36 Käseereien hatten sie in schlechtem, mehrere davon in sehr dreckigem Zustande, eine Käseerei hatte dieselben 72 Fuß weit weg von der Käseerei, und 3 Käseereien hatten keine Fässer. 20 Käseereien sind auswendig angestrichen, 27 Käseereien sind nicht angestrichen, und eine Käseerei ist so schlecht, als man sie nur sehen kann, also wahrscheinlich von Farbe keine Spur vorhanden.

Auf 37 Käseereien waren die Farmer-Milch-Kannen in ziemlich gutem und reinlichem Zustand (ein direkter Beweis, daß die Frauen hier ihre Hände im Spiel hatten), auf 8 Käseereien waren welche Kannen alt und beschädigt, auf 2 Käseereien waren welche Kannen nicht reinlich und auf einer Käseerei waren die Kannen in schlechtem Zustande, weil die Molken zu lange darin gelassen wurde.

Was nun dazumal Uebel waren, sind es noch heute, und will ich nun einige der wichtigsten Bedürfnisse der heutigen Käseereien nennen.

Vor allen anderen Bedürfnissen ist:

Erstens: Keine, unverfälschte, gute Milch von gesunden Kühen am nothwendigsten; dann

Zweitens: Ein guter Käser, der einen oder mehrere Kursus in der Molkeerei-Schule in Madison durchgemacht hat.

Ein Käser soll in seinem Fach ein gelehrter Mann, ein Chemiker sein, um die verschiedenen Zerfetzungen in der Milch, die während des KäSENS vor sich gehen, und sich dann auch wieder in dem hergestellten KäSE zeigen, erklären zu können. Wir wissen im Allgemeinen wohl, daß das Laab die Milch gerinnt, daß die Wärme dann mit dem Laab vereint den KäSE von der Molken scheidet, daß der KäSE im Keller auf Lager in Gährung übergeht und je nach dieser Gährung entweder zu viel oder zu wenig, oder gar keine Löcher macht, aber wenn wir erklären sollten, wie alles das zugehe, so sind wir eben am Hang an, und können nicht weiter. Ein guter Käser kann stolz sein auf seinen Beruf, und ist in seinem Fach ebenso ein gelehrter Mann, als einer, der in einer Universität hinter dem Pult steht und eine alte Sprache lehrt. Jedem Käser wird überhaupt eine große Sache, die einen Werth von vier bis zehn Tausend Dollars repräsentirt, anvertraut, und soll sich hiermit auch ein jeder Käser in Hinsicht auf sein Wissen und Können, sowie des großen Vertrauens, das man in ihn setzt, auch demgemäß betragen, und ist in der Hinsicht im Allgemeinen nur Gutes zu melden, denn die Käser heutigen Tages sind

im großen Ganzen ein viel veredelter Schlag Menschen als sie früher waren.

Drittens sollen sich in jeder Käse- die Babcock Milch- Probe, sowie auch die Gähr- Probe (Wisconsin Curd Test) vorfinden, wenn es auch etwas Geld kostet, dieselben anzuschaffen, so würden sie doch vielen Streitigkeiten ein schnelles Ende bereiten, sowie dem Käser sehr viele Unannehmlichkeiten und dem Milchkäufer viel Geld ersparen, indem durch solche Proben die Ursachen des Fehlgehens viel schneller entdeckt werden können. Natürlich muß dann der Käser auch gelernt haben, wie mit diesen Proben umzugehen.

Viertens sollten in einer jeden Käse- Fliegenthüren und Fliegenfenster angebracht werden, um der Bequemlichkeit und der Reinlichkeit willen.

Wenn der Käser nach harter Arbeit etwas ausruhen will, so kann er, wenn den Fliegen der Eingang abgeschlossen ist, ein Schläfchen machen, und liegen bleiben, wo er sich hingelegt hat, ohne daß er die Gefahr laufen muß, mit dem wilden Hin- und Hererschlagen, um die Fliegen zu vercheuchen, von seinem Ruhebett hinunterzufallen, oder seinen Arm weh zu thun — und ungeachtet, daß Fliegen billiger sind als Korinthen, so ist es doch viel besser, wenn sie aus dem Käse und ganz besonders aus der Butter wegbleiben.

Fünftens sollte in jeder Käse- streng darauf gesehen werden, daß das Abwaschwasser in einem besonders dafür gemachten Abzugs-Graben von der Käse- weg in ein entferntes, gut gemachtes Sinkloch geleitet wird, so daß nicht Pfützen von stinkendem Wasser um die Käse- herumstehen und Brutstätten von Krankheitskeimen und verschiedenen Bakterien werden. Noch nicht lange zurück machte eine Gesellschaft von Damen und Herren von Monroe einen Ausflug nach New Glarus — von Monroe nach Monticello per Eisenbahn und von Monticello per Fuhrwerk nach New Glarus — und sie behaupteten, daß sie jedesmal eine ganze Meile zum Voraus eine Käse- mit ihrem Geruch-Organ sehen konnten.

Sechstens sollten anstatt der Molken- Fässer Molken- Behälter aus Holz oder noch besser aus Cement gemacht und gebraucht werden, um die Molken der Farmer darin aufzubewahren; solche Behälter, die mit einem großen Hahnen (oder auch mehreren) versehen sein können, sind dann viel leichter zu waschen und rein zu halten. Die Molken- Fässer geben den Käse- ein trauriges, übelriechendes Aussehen und glaube ich, im Falle die Fässer wegtämen, daß ganze unzählbare Familien von

Bakterien sich um andere Wohnungen umsehen müßten. Ein Fremder, der die Straße daher kommt, müßte dann fragen, was das für ein Gebäude sei, und nicht schon lange im Voraus riechen können, daß er zu einer "Cheese Factory" komme.

Siebtens sollten alle Käseereien in gutem Zustand gehalten werden und auswendig auch schön angestrichen sein, so daß Jedermann, der vorbei fährt oder geht, den Eindruck bekommt, hier herrscht Ordnung, hier ist Wohlstand im Land. Eine niedere, schiefstehende Käseerei macht einen erbärmlichen Eindruck, man meint, man sollte sich mit dem Rücken auf die andere Seite stellen und probieren, die Sache wieder in die gehörige Lage zurück zu drücken; man bekommt überhaupt den Eindruck, daß die Farmer, denen die Käseerei gehört, der Käser, der darin waltet, sowie auch der Käse, der darinnen gemacht wird, nicht weit her sein können, obgleich manchmal der Schein trügt. Die Käseereien sollten auch nothwendig im Allgemeinen mehr Keller-Raum haben, und für die Verbesserung der Käser-Wohnungen ist Raum genug vorhanden. Milch-Käufer sollten besonders darauf sehen, und für Milch, die in schlechten, baufälligen Käseereien verarbeitet wird, nicht so viel bezahlen als für Milch, die in moderne Käseereien kommt.

Achtens sollten die Milchkannen, in denen die Milch von der Farm zur Käseerei gefahren wird, nicht alt, rostig, beschädigt oder unrein sein, sondern blank, rein und schön aussehend. Ein jeder Farmer kann heut zu Tage bei den hohen Milch- und Käse-Preisen Alles in bester Ordnung halten. Für die Molken aus der Käseerei heimzufahren, sollten extra Kannen dazu benutzt werden. Wir alle, Farmer, Käser, Milch-käufer und Käsehändler, wollen unser Bestes thun, um der guten Sache voranzuhelfen, so daß endlich einmal die Zeit kommen mag, wo es in dem Bericht der „Dairy and Food Commission“ heißt, daß ein jeder Käser im südlichen Wisconsin einen Kurs in der Versuchsstation zu Madison durchgemacht habe, daß in einer jeden Käseerei die Babcock Milch-Probe und die „Wisconsin Curd Test“ gebraucht werden, daß eine jede Käseerei mit Fliegenthüren und Fliegenfenstern versehen sei, daß bei einer jeden Käseerei auf's Beste dafür gesorgt sei, das Abwaschwasser auf guten Wegen von der Käseerei zu entfernen, daß anstatt der alten Mode von Molken-Fässern die neue Mode mit Holz- oder Cement Molken-Behälter auf einer jeden Käseerei eingezogen sei, daß eine jegliche Käseerei im südlichen Wisconsin sich ein neues Kleid angezogen habe, sowie daß ein jeglicher Farmer in der Reinlichkeit betreffs der Kühe, der Milch und der Milchkannen sein Bestes thue.

Die Milchfehler.

August Schnebele, Brodhead, Wis.

Als Milchfehler bezeichnet man abweichende Eigenschaften der Milch von ihrer sonstigen Beschaffenheit, Abweichungen, die in der Regel die Verwendbarkeit derselben für gewisse Verwertungsarten beeinträchtigt.

Ueber die Ursachen der verschiedenen Milchfehler und deren Folgen für die Verarbeitung der Milch zu Milchprodukten hatte man früher wenig Kenntnisse und auch jetzt sind dieselben bei weitem noch nicht alle erforscht. Immerhin haben die Bakteriologen und die praktischen Erfahrungen der letzten Jahre über manchen Punkt Klarheit gebracht.

Auf alle die wissenschaftlichen Entdeckungen, die bis jetzt schon gemacht wurden, komme hier nicht ein und besaffe mich nur mit solchen Milchfehlern, die speziell für die Schweizertäfererei in Betracht kommen.

1. Salzige Milch.

Oft liefert eine Kuh an einzelnen, oft auch an allen Strichen salzige Milch. Der salzige Geschmack ist ein Ueberbleibsel einer Entzündung der Milchdrüsen und rührt her von einem hohen Aschengehalt, oder einer veränderten Zusammensetzung der Milchsahe. Die salzige Milch reagirt häufig alkalisch und koagulirt schwer mit Lab, weshalb dieselbe für die Käsefabrikation schädlich.

Die Nachweisung dieses Fehlers kann durch die Sinnesprobe constatirt werden.

2. Bittere Milch.

Dieselbe kann verursacht werden:

a. Durch Futtermittel, welche einen bitteren Geschmack haben oder einen Bitterstoff enthalten wie Suppen, Senf, Rübenblätter etc.

b. Durch altmeltige Kühe, die häufig an einzelnen, oft auch an allen Strichen salzig-bittere Milch geben.

c. Durch infectiöse Euterentzündungen.

d. Durch Bacterien, welche die normale Milch bitter zu machen vermögen. Solche Bacterien wurden von Prof. G. v. Freudenreich in Proben von Emmenthaler und Spalenkäse gefunden.

Die Richtigkeit dieser Entdeckung bewies v. Freudenreich damit, indem er solche Bacterien züchtete und nachher mit gesunder Milch verimpfte, die dann ebenfalls bitter wurde. Solche Milch giebt einen bitteren Käse und ist deshalb im Interesse des Milchkäufers auszuschließen.

3. Ziegriige Milch.

Dies ist ein sehr häufiger Milchfehler, der als Folge einer Euterkrankheit anzusehen ist. Beim Auftreten des Ziegers in der Milch, der entweder schleimig oder körnig sein kann, ist die Krankheit, der Euterkatarrh oder die Euterentzündung, gewöhnlich schon im Abnehmen begriffen und nicht, wie Viele meinen, daß dann die größte Gefahr vorhanden ist. Immerhin ist solche Milch für die Käsefabrikation schädlich und beginnt die schädliche Wirkung häufig schon, ehe und bevor der Zieger wahrgenommen wird, sofern es sich um einen Euterkatarrh handelt. Das Vorhandensein von Ziegerklümpchen wird bei einiger Aufmerksamkeit in der Regel beim Melken schon bemerkt, sonst aber beim Seihen der Milch, weshalb die Käser hierzulande an dem Schweizermodus festhalten, d. h. die Milch muß ungefeicht in die Käserei geliefert werden.

Die Dairy School zu Madison empfiehlt die Milch auf der Farm zu seihen und zwar aus folgenden Gründen:

Der Schmutz, bestehend aus Rinderkot, Hautschuppen, Haaren und Milchresten, der häufig beim Melken in die Milch gelangt, enthält zum Teil nicht nur selbst schon eine Anzahl von Spaltpilzen, sondern ist auch ein ausgezeichnete Nährboden für diese. Ebenso bietet die Temperatur der Milch, die dieselbe nach dem Melken hat, das beste Wachstum für die Bacterien, die sich oft in kurzer Zeit verdoppeln und dann häufig auf die Gährung der Käse einen schlechten Einfluß ausüben können, was vielleicht, wenn die Milch auf der Farm gefeicht würde, bei der geringen Anzahl nicht der Fall wäre. Diese Ansicht finde für gerechtfertigt, da übrigens auch die Chamer Milchgesellschaft schon seit vielen Jahren den Farmer die Seier gratis zustellt und ebenfalls dasselbe vorschreibt, dergleichen kann es gut sein für Creameries und Käsereien, die amerikanischen Käse fabriziren, wo die ziegriige Milch so viel wie keinen Einfluß ausübt; auch für die Schweizertäsereien wäre dieses Verfahren zu empfehlen, wenn dann jeder Farmer so viel Einsicht hätte, die ziegriige Milch dazim zu behalten, und nicht, wenn sie schön gefeicht, dem Käser bringen würde. Ich meinerseits denke, daß jeder Farmer mehr zur Reinlichkeit beim Melken angehalten wird, wenn er die Milch nicht seihen

darf, da andernteils, was man sauber nennt und die Qualität der Milch, die in die Kanne gelangt, oft viel zu wünschen übrig lassen.

4. Nicht gerinnende Milch.

Dieser Fehler besteht darin, daß die Milch durch Zusatz von Lab nicht in normaler Weise zum Gerinnen oder Ausdicken gebracht wird. Das Dicken folgt entweder viel zu langsam, unvollständig oder gar nicht. Solche Milch zeigt vielfach einen salzigen Geschmack und eine alkalische Reaction, in andern Fällen dagegen schmeckt sie süß und ist durch die Sinnesprobe nichts Abnormales zu konstatiren. In jedem Fall haben wir es zu thun mit einem unrichtigen Verhältnis, zwischen dem durch Lab fällbaren Käsestoff in der Milch und den übrigen durch Lab nicht fällbaren Eiweißstoffen, wie Albumin, Lactaprotein und Lactoglobulin. Für den direkten Konsum kann diese Milch unter Umständen ganz gut verwendbar sein, sowie auch zur Butterfabrikation, für die Schweizerkäsefabrikation dagegen ist sie nicht nur wertlos, sondern direkt schädlich. Infolge dem unvollständigen Ausdicken bleiben in der Sirte mehr Eiweißstoffe zurück und dieselbe behält eine weiße Farbe, eine Erscheinung, durch welche man zuerst auf den Fehler aufmerksam gemacht wird. Mit dieser weißen Sirte, die sich meist schwer und unvollständig ausdrücken läßt, bleiben aber immer im Käse leicht zersetzbare Eiweißstoffe (Albumin) zurück, welche eine zu rasche Gährung, ja sogar Fäulniß verursachen. Die Folge davon sind nasse, faulende und tönende Stellen, Sirtenspalte, nitzrige und geblähte Käse. Die Nachweisung dieses Fehlers geschieht durch die Labprobe.

5. Rasch gährende und treibende Milch.

Dieser Milchfehler zeigt sich namentlich bei der Prüfung in der Gährprobe und Labprobe in dem Vorhandensein einer starken Gasentwicklung. In der Gährprobe wird hierbei die Rahmschicht emporgehoben und häufig sogar zum Uebergießen über das Probeglas gebracht, in der Labgährprobe (Curd Test) dagegen zeigt sich der ausgeschiedene Käsestoff einen Klumpen schwammig aufgetriebene Beschaffenheit, mit überriechendem gasigen Geruch. Die Ursache dieses Fehlers liegt wohl meist in der starken Verunreinigung der Milch durch gasbildende Bakterien, herrührend von der Verabreichung verdorbener Futtermittel, schlechtes, verdorbenes Tränkewasser, wie dies das Vieh zuweilen bei

trocknem Sommer auf der Weide findet, und unreinlichem Melken. Indessen kann auch eine abnormale Zusammensetzung und krankhafte Beschaffenheit der frischgemolkenen Milch, dieselbe zu leichter Zersetzung und rascher Gährung bringen. Besonders zeigt sich dieser Fehler, wenn eine Euterkrankheit vorangegangen ist. Für die Käsefabrikation ist solche Milch schädlich, da sie frühe Gährung und Blähung verursacht.

6. Leicht zersetzbare Milch.

Dieser Fehler zeigt sich ebenfalls bei der Prüfung der Milch in der Gährprobe. Die Milch scheidet dabei leicht aus, d. h. es findet schon nach 9—12 Stunden eine mehr oder weniger vollständige Trennung der Sirte und des Käsestoffes statt. Letzterer ist dabei entweder griesig oder zähflockig, zigerig oder klumpig ausgeschieden, die Sirte dagegen weißlich oder trüb. Vielfach, jedoch nicht immer, geht dieser Fehler Hand in Hand mit starker Gasentwicklung. Die leicht zersetzbare Milch rührt her von der Verabreichung verdorbener, namentlich saurer Futtermittel, schlecht gereinigten Milchgeschirren, erstickter Milch, Euterkrankheiten, einem beginnenden Euterkatarrh, und namentlich auch von altmeltigen Kühen.

Für die Käsefabrikation ist dieselbe gefährlich, da sie eine unregelmäßige und unberechenbare Gährung veranlaßt und zwar eine im Anfang rasch und stürmend verlaufende, als auch eine lang andauernde, teilweise unterbrochene und wiederbeginnende Gährung.

7. Saure oder alkalisch reagierende Milch.

Die normale Reaction der Milch ist eine doppelte oder sogenannte amphotere Reaction, d. h. schwach sauer und alkalisch zugleich. Eine ausgesprochene saure Reaction ist die Folge einer zu großen Anzahl von Milchsäurebakterien, herrührend von einer zu langen Aufbewahrung der Milch oder aber das Vorhandensein von Brieschmilch. Der durch die Milchsäurebakterien verursachte Vorgang des Sauerwerdens der Milch wird besonders begünstigt durch die Verabreichung saurer Futtermittel und schlecht gereinigte Milchgeschirre.

Schlimmer, indessen weniger häufig wie die saure Reaction ist eine ausgesprochene Alkalische Reaction. Eine solche Milch wird durch Lab nur unvollkommen oder gar nicht zum Gerinnen gebracht. Die Folgen für die Käsefarbe sind dieselben wie bereits oben unter No. 4 besprochen, tönende Stellen, Sirtenspälte etc. Die Nachweisung dieser Milchfehler geschieht durch die Säurebestimmung.

8. Schleimige, fadenziehende Milch.

Dieser Milchfehler zeigt sich entweder schon beim Melken, oder er tritt erst zu Tage bei der Aufbewahrung der Milch. Im letzteren Falle wird er verursacht durch einen Microkokus, durch dessen Wachstum der Milchzucker in schleimige Gährung versetzt wird. Dabei läßt sich besonders der Rahm, oft auch die Magermilch zu mehr oder weniger langen Fäden ausziehen.

Dieser Fehler ist übertragbar, indem gesunde Milch durch Zusatz von fadenziehender Milch ebenfalls in schleimige Gährung versetzt wird. Ebenso tritt der Fehler auf in der Sirte, die nach zirka 12 Stunden auf der Presse aus dem Käse tritt, sowie in Lab und Sauer.

Die Ursache, d. h. der fragliche Microkokus, kann herkommen aus verdorbenem Futter, verdorbenem, lang gestandenem Tränkewasser, aus der Streue, dem Stallboden, den Milchgeschirren etc.

Die Folgen dieses Milchfehlers denke sind jedem Milchinteressenten bekannt von einer Käseerei bei Gratiot her, über dessen Fall Herr Dr. Ruffel in Madison letztes Jahr ein Bulletin veröffentlichte, das jedem Käser frei zugestellt wurde und den Fehler, dessen Ursachen und Verhütung genau behandelte.

9. Andere Milchfehler.

In der milchw. Literatur findet man noch manche Milchfehler angegeben, die aber hier fast unbekannt sind und denen eine größere Bedeutung nicht zukommt, wie blaue, rote und sandige Milch.

Blaue Milch denke sieht man hier keine, ohne sie sei dann abgerahmt; rote Milch kann herrühren durch Blut und Blutfarbstoffe, die in die Milch übergegangen sind, und sandige Milch herrührend von Milchsteinen, die sich im Euter gebildet haben und hauptsächlich aus Kalk und Magnesiumsalzen bestehen, welche als Folge von zu kalkreichem Tränkewasser anzusehen ist.

Bei der Butterfarbe treten gelegentlich auch abnormale Erscheinungen auf, die durch Milchfehler verursacht werden, womit ich mich hier aber nicht näher befasse.

Correct Methods of Packing and Weighing Cheese.

Chris. Roth, Monroe.

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

It is with pleasure I greet you here today. However, I feel somewhat out of place in addressing you on this occasion, for I am not gifted as a speaker which you all will realize before I finish reading my paper. It would be more in accord with my wish to receive instruction rather than attempt to instruct, we generally receive greater profit from the advice and help of others than the counsel we give.

The subject assigned to me by your worthy president, is "The Boxing and Weighing of Cheese." This subject naturally brings up the question as to the kind of cheese we desire to pack or box. In reply we would say nothing but good, fancy, round Swiss, block Swiss, brick and limburger cheese.

Cheese that will stand the test and reach the grade of any market in the United States. Do we know how and are we able to make such cheese? Certainly, not one of you here today would dare to stand up and declare that we are not able to make cheese equal to such a test. Good, fancy cheese alone will not satisfy the various markets of the United States, they require strong well made boxes or tubs with clean and neatly packed cheese. Many cheesemakers are careless or thoughtless in regard to making, boxing and packing cheese. They care little how it is made, simply so it is good and to them the matter of packing is of very little importance. This is a serious mistake. The best obtainable material should be used in boxing or packing any kind of cheese. In tubs for round Swiss cheese nothing but sound and best seasoned staves should be used, the top and bottom of the tub should be made of good planed lumber, nails driven through the cleats of the same should be well clinched if not they often damage the cheese in the tubs. Not less than two eight penny nails in each end of the stave

should be used in making a tub. Often I find but one nail in each end of the stave with hoop nailed over same. A tub thus made will not be solid and if for any reason the same must be repacked the top hoop will hinder the pulling of nails. The only possible way to get the cheese out of the tub is to remove the hoop then, nine times out of ten, after cheese is removed from the tub it will fall down so that before you can repack same, you will be compelled to rebuild your tub. Great care should be exercised in making tubs. A tub should be solid, without cracks so as to prevent mice from getting into the cheese. A tub weighing over 800 lbs. should have three hoops, one nailed directly with bottom of the tub, one about three inches from top, and about center of tub. Every tub should be so made that cheese will fit in closely and thus rest against staves of the tub. In packing cheese do not put large and small cheese in the same tub and by all means, do not pack No. 1 and 2 cheese in same tub. It is very unpleasant and moreover unprofitable for any dealer to ship out a tub of mixed cheese as No. 1 to his customer. It is sure to cause trouble which so often comes back upon the original party who packed the cheese. No. 1 and 2 and damaged cheese should be put in separate tubs and positively marked according to kinds. In weighing and packing round Swiss be sure and weigh empty tub first. The weight of each cheese should be placed on the lid of the tub, also, the sum total of the aggregate weight of cheese. Do not fail to place the weight of empty tub on the lid, if this is done it will greatly assist the buyer in packing cheese. For every 100 lbs. of round Swiss 1 lb. should be allowed for shrinkage. Be sure your scales are right—short weights are mischief makers to all concerned, the cheesemaker and milk patrons as well as dealer and jobber. There has been cases where cheesemakers gave 101 to 105 lbs. of milk for every 100 lbs. and at the close of the season he realized that it took 12 to 13 lbs. of milk to make 1 lb. of cheese. Suppose he has bought the milk. He condemns the milk for containing so little cheese, this rumor spreads and the next season the milk patrons of said factory get 5 or 10 cents per 100 lbs. less. Should it be a cooperative factory the patrons will be free to censure the cheesemaker for using 13 or 14 lbs. of

milk to make a pound of Swiss cheese. All this trouble is caused by an old worn out scales such as we often see in many factories today. Take care of your scales and if possible have them tested each spring.

Block Swiss cheese boxes properly made, the frame must be nailed with four 8 penny nails on each corner, top and bottoms can be nailed with 6 penny nails, four nails to each board except boards of more than 6 inches wide should have 6 nails. Carefully weigh each empty box and with lead pencil plainly mark same in right hand corner of box. A box weighing $19\frac{1}{4}$ lbs. should not be marked 19 lbs. but 20 lbs. in packing block Swiss put a scale board between each cheese, do not pack same too closely, pound or drive cheese in box so that the box will have to be broken in order to get cheese out. After the box is packed weigh the same and mark weights above the weight of empty box. If the box weighs 190 lbs. only 188 lbs. should be put down, brick and limburger boxes should be made the same as block Swiss boxes with the exception less nails may be used. Brick cheese should be packed in parchment paper first, and then in manila paper and not in manila paper first as I have so often seen it. Before placing same in the box cover the bottom with a big sheet of paper, also a sheet on top before closing box. A large sheet of paper known as "box lining" is the cheapest and more serviceable paper to use, in fact it is the only kind that is of any benefit to the cheese. Brick paper used for this purpose so often slips together thus proving a greater detriment to the cheese than benefit. Boxes packed with brick should not be left standing on ends but always laid flat and if piled, separated by a strip to prevent heating. Limburger cheese should be packed as follows: Wrap in parchment and manila paper then with tin foil, pack same in three rows the short way in box, when three rows of cheese are in the box put in a center board and nail same with two nails on each side, pack the balance of box and before closing same place a large sheet of paper over top of cheese. In weighing brick and limburger always allow 1 lb. per case for shrinkage. Be sure and pack No. 1 and 2 in separate box. Do not think you can pack a box of poor stuff

among 20 or 30 cases of good, if you do you are apt to spoil the whole lot. This method often practiced will cause the various dealers to pass your factory for they can never be certain what they will get. If packed in separate box the loss may be less than \$5 but if mixed with a lot of good cheese it may be \$50 or more.

Much more should be said on this subject, but on account of time I am obliged to close.

Whey Butter.

Prof. E. G. Hastings, Madison.

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

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

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

The Cold Process of Skimming.

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

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

The Hot Process of Cream Separation.

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

In the hot process of skimming, the cream is thoroughly pasteurized by the the continuous heating it receives and therefore it does not sour so quickly as the cold process cream. The butter made from the hot process is, therefore, considerably sweeter than that from the cold process cream, and on this account a better price can usually be obtained for it.

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

some cases as low as one-tenth of one per cent. fat.

Conditions of the Whey.

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

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

The Cheese Maker's Method of Ripening Cream.

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

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

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

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

cooled by stirring it.

The Use of a Separator for Skimming Whey.

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

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

Disposing of the Separator Whey.

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

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

milk. The separator, therefore, at a Swiss cheese factory makes it possible to deliver to the patrons a perfectly sweet whey.

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

The Swiss Cheesemaker's Churn.

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

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

Composition of Whey Butter.

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

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

Losses at Some Factories.

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

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

A Whey Butter Churning Station.

It has been suggested that a profitable business could be done if a churning station was built in a neighborhood where there was a considerable number of Swiss cheese factories, the cheesemaker at each factory skimming the whey with a separator, then pumping the whey into a clean storage tank, and the parties running the churning station gathering the cream each day from a number of cheese factories. This churning of the cream at one central place which is well equipped for the purpose would give a better quality of butter than that made at each of the factories and would also relieve the cheesemakers of the buttermaking. I am inclined to think that this proposition could be worked out advantageously to all parties interested. At the present time the

Whey butter made at Wisconsin Swiss cheese factories is not a first class article of table butter; it sells for about the price of lard and only about one-half the butter fat in the whey is recovered. The old methods that are responsible for these losses should be changed as the use of a separator for skimming the sweet whey, and modern appliances for ripening the cream and making the butter will easily double the amount that has been received for whey butter in the past.

Tuberculosis in Cattle.

Prof. E. G. Hastings, Madison.

The disease of tuberculosis in cattle is a most important one to every citizen, whether he is directly interested in the raising of cattle, or in the handling and manufacture of dairy products, or indirectly interested in the dairy business as a consumer of milk and its products. The consumer is, or should be, interested in the health of the cattle whose milk he uses.

There are several phases of the subject that might be discussed. I might tell you something of the disease in the animal, the tissues that are affected. I might discuss the relation of tuberculosis in cattle to the disease in man, the hygienic phase of bovine tuberculosis, but I have chosen a phase which I deem more important to you, as owners of dairy cattle, as manufactures of cheese. This, I think, may well be called the financial phase—that is, the relation of the disease to the future success or failure of the herd. If this disease is present in your herd, sooner or later you are sure to lose, to lose through the death of cattle, through decreased production in the case of animals in advanced stages of the disease. Every one is willing, yea glad, to pay a certain sum that he may be insured against loss of his home by fire. I wish to tell you today how you can insure your herd against loss by this most dreadful disease.

Again, if you suspect that a fire is smouldering in the walls of your house, every effort is made to discover if a fire really exists, and if it is found, it is extinguished, if it can possibly be. I want to tell you how you can find out whether you have the fire of tuberculosis in your herd, and if you have, how you can put it out.

First, I wish to bring to your attention something concerning the amount and distribution of the disease in the state. For a number of years tests have been made under the direction of the Experiment Station, or of the State Veterinarian, of herds that were suspected and of herds in

which there was no reason to suspect the presence of the disease. About 8000 cattle have been tested, only a drop in the bucket when we realize that there are over 1,000,000 dairy cows in Wisconsin. Yet a study of the data contained from the tests of these 8000 cattle, of all breeds, in all parts of the state, should give us a very true picture of what we may suspect to find among the 992,000 remaining. Of the 8000 tested, about 1500 have been found to be tuberculous. A closer study of the available data will possibly give us results which are more nearly true than the bare statement.

The following tables are taken from Bulletin 133 of the Wisconsin Experiment Station:

Table I—Tuberculin tests made on suspected herds.

	Number of herds tested	Number of herds showing reactions	Number of animals tested	Number of animals reacting	Per cent affected
State Veterinarian 1898-1900.....	.....	.....	588	191	32.5
Experiment Station to 1900.....	.....	.....	323	115	35.6
Live Stock Sanitary Board, 1901.....	43	36	807	242	30.0
Live Stock Sanitary Board, 1902.....	34	23	732	166	22.0
Live Stock Sanitary Board, 1903.....	48	39	1316	331	25.1
Live Stock Sanitary Board, 1904.....	67	51	929	209	22.4
	192	149	4695	1254	26.7

Table II—Tuberculin tests made on Non-suspected herds.

	No. of herds tested	No. of herds showing reactions	No. of animals tested	No. of animals reacting	Per cent affected
Under auspices of Exp. Sta. to 1901.....	.....	.....	935	84	9.0
Under auspices of Exp. Sta. in 1901.....	22	10	425	84	19.7
Under auspices of Exp. Sta. in 1902.....	14	5	306	42	13.7
Under auspices of Exp. Sta. in 1903.....	11	4	182	5	2.7
Under auspices of Exp. Sta. in 1904.....	33	13	688	44	6.4
Under auspices of Exp. Sta. in 1905.....	41	17	726	44	6.0
	121	49	3262	303	9.3

The results here detailed naturally show that the percentage of reacting animals is much larger in the case of suspected than in the unsuspected herds! In 4,700 examinations made in suspected herds, over 1,250 reactions were found, or about one in four. In the case of herds which had no especially bad history, the percentage of reacting animals in 3,262 cases was somewhat less than 10 per cent. From the above results it is evident that at least 10 per cent. of the milch cows of the cows of the state are tuberculous.

The disease is distributed all over the state, no section is free from it. In some parts, however, it is much more prevalent than in others. During the course of the work, two sections of the state have been discovered in which a much larger number of cattle have been found to be tuberculous than the average shown by the figures given. In the eastern part of Dane County, over 50 per cent. of the cows furnishing milk to certain creameries have been found to be diseased. Conditions about as serious as those that obtain in northern Germany and Denmark.

The uneven distribution of the disease in the state is paralleled by the uneven distribution of the disease in herds. Many herds in which there was absolutely no reason to suspect the presence of the disease have been found to have from 50 to 75 per cent. of the animals affected. In others but a single animal was found to be tuberculous. Thus it is clear that from a casual examination, the owner can tell absolutely nothing concerning the condition of the herd as regards the presence or absence of tuberculosis. The question may well be asked, how can this be so, for it would seem that if a large number of animals were affected with the disease, some at least should show evident physical symptoms. Here is where the danger lies. This is the great difference between tuberculosis and other transmissible diseases in cattle. On account of this fact, it is very difficult to bring people to realize the importance of this disease to the dairy interests of the state. If tuberculosis ran its course with the frightful rapidity of anthrax, or black-leg, the difficulty to which I have referred would not be present. Tuberculosis may be present in the system of

an animal for years and yet the animal show no physical evidences of the disease. Yet this animal may be a constant source of danger to the remainder of the herd. The long-continued developments of the disease gives an opportunity for wide-spread infection of the herd before the trouble is apparent to even the most watchful owner.

The disease is introduced into the healthy herd in a number of ways. The promiscuous purchasing of cows is one of the most frequent ways in which the disease is brought into a healthy herd. From what we learned in regard to the distribution of the disease in the state, it is evident that if a farmer buys a cow, the chances are one in ten that the animal is tuberculous, or if the farmer purchases ten animals, one of them is likely to be tuberculous. The effect of this factor is well shown in the prevalence of the disease in those districts engaged in the production of milk for city consumption. Here it is desirable that the output be about the same during all seasons of the year. This necessitates the buying and selling of many cattle.

The disease is frequently introduced in the attempt to improve a herd by the purchase of pure-bred stock. A striking instance of the role of the public auction in spreading the disease has been described in Bulletin 114 of the Wisconsin Agricultural Experiment Station. The disease was introduced into thirteen herds through the disposal of a single tuberculous herd.

Another way in which the disease may gain a foothold in the herd is through the use of mixed creamery skim milk as a feed for calves. In the case of the creameries mentioned above, where over 50 per cent. of the cows were affected, it was evident from the distribution of the disease in several herds that the skim milk had been the introducing agent.

When the disease is once brought into the herd, it may spread rapidly or slowly, depending upon a number of factors. The conditions especially favoring the spread of the disease are poor ventilation and lack of light. Where animals are forced to breathe an atmosphere saturated with the products given off from their own bodies, their bodily vigor is sure to be low and, as a result, they are much more

likely to acquire tuberculosis than if ample provision for ventilation had been provided. The effect of light is not only beneficial upon the animals themselves, but it tends to destroy the organisms causing the disease when the same are given off by diseased animals. A striking instance of the effect of poor ventilation and lack of sunlight was found by the state authorities at Argyle, Wisconsin, where 69 animals out of a herd of 72 were found to be tuberculous. The barn in which this herd was kept had no provision for ventilation and was so dark that one could not see to read in it at noonday.

Many are asking how can I determine the condition of my herd? The answer is to apply the tuberculin test. This test is not a fearful and wonderful thing to be applied only by experts. In bare outline, the test consists in taking a series of temperature readings on each animal, the injection of the tuberculin beneath the skin by means of hypodermic syringe, and then the taking of a second series of temperatures on each animal. Because it has been realized that the test can only be generally used if the farmer can apply it himself, an effort has been made to popularize the tests. The results have been very gratifying indeed. Thousands of tests have been made which would never have been carried out if the application of the test had been confined to professional channels. The farmer who has tested his herd and has found it free of this disease is in a position to keep it free, for since he has learned to apply the test, he can determine at the minimum of expense and trouble the condition of every animal he brings into his herd.

It is impossible to enter into the details of the application of the test here, the conditions to be observed, the interpretation of the temperature readings, etc. On application to the Experiment Station, Madison, any farmer can obtain literature describing fully and clearly how to test his own herd, and the conditions under which tuberculin is furnished free of cost by the Experiment Station.

In conclusion it may be stated that at least 10 per cent. of the milch cows of Wisconsin are infected with tuberculosis. That the presence of a single tuberculous animal in

a herd is a constant menace to the health of the herd; that sooner or later the owner is sure to suffer financial loss through it; that wisdom and prudence demand that every owner of cattle determine their condition at once, in order that if they are free from the disease, they be kept so, or that if some part of the herd is found to be diseased, the affected cattle be removed; that the Agricultural Experiment Station stands ready to aid in every possible way any Wisconsin farmer who wishes to test his herd.

Transportation and Freight Rates.

John Luchsinger, Monroe.

Mr. Chairman Ladies and Gentlemen. You may think that this subject of transportation is somewhat foreign to cheesemaking and dairying, yet, in fact, it is a vital part of the business, but for the convenient and rapid transportation of today our cheese industry would have no greater dimensions than would supply those close to the makers. Wherever any district produces only so much as its people can consume the question of transportation is not important, such product can be easily and cheaply carried to the consumer in many ways and without railroads, but when the product has increased much beyond the needs of such district then the question of rapid and safe transportation becomes of the first importance for without such transportation any surplus product is nearly worthless. Before the days of railroads the pack-horse and cart or wagon, and later on the canal and stream were relied on to carry goods of all kinds to market. The sailing vessel carried them across seas to distant lands. For centuries these were the common modes of carriage, slow but sure, and the progress of the world was just as slow and sure. Then came the present day railroad with its fast trains reaching with its rails to the farthest parts of civilization, opening up and filling with settlement vast stretches of country which but for them would have remained savage and unsettled for years longer.

There are countries yet where by reason of their roughness, the most primitive as well as the most modern modes of carrying freight are in use side by side. In Switzerland cheese is mainly made on the mountain pastures to which not even wagon roads can be built. It is carried thence to the highways and small towns by men or pack-animals thence by wagons to the railroads.

In our own country the cheese industry has grown from a very small home industry begun in the kitchens of the early

Swiss settlers of Green county in the years following their immigration in 1845. For many years their surplus product was carried by wagon to nearby towns for sale, later when factories multiplied so as to demand for their milk supply section after section of farms the immense product sought and found markets in all of the trade centers of this and other countries, railroads were a necessity, without them we could never have expanded the cheese industry until now it covers all of Green county, a large portion of Lafayette, Dane and Iowa and is moving across and going all over southwestern Wisconsin, they carried our cheese safely and speedily at reasonable rates and for nearly thirty years until 1898, shippers and railroads worked in harmony and peace as the cheese industry increased so did the earnings of the railroads and both prospered during that period. Cheese was rated as a commodity and carried for 20 cents per hundred to Chicago or Milwaukee from Monroe and from other shipping points in proportion as distance was greater or less. There was no complaint by shippers that this rate was excessive, nor any intimation from the railroads that it was not enough.

Suddenly and without warning, and without reason or excuse the railroads on which our cheese was being shipped got together on the idea that cheese production was profitable, that it was increasing and spreading on all sides and that therefore it could stand a raise in freight tariffs. There was no pretence that it cost more to carry it or that the risk of loss had increased. They simply severally issued an order that after a certain date cheese would be classed as second class freight same as butter and would be charged 33 cents per hundred in place of 20 cents as before. And the change was made and the high rate was charged and collected in spite of protests against such unjust extortion. It is but fair to mention that then the roads officially permitted cheese to be concentrated at half local rates from the smaller towns to the central shipping points, and thence if shipped in car lots the rate would be only 22½ cents per hundred. This plan would have been very plausible if after concentration all or a large portion of cheese were shipped in car lots, such a

plan of course would benefit the car load shippers, but on the other hand would extinguish the small dealer and hinder the producer in shipping their own product but the fact is, that but a small proportion, less than 1-5 of our cheese is shipped in car lots, and taking into account the large amount of cheese brought to the central points on wagons it is safe to state that as much cheese is shipped out at the high (less than car load) rate as comes into those central points at concentration rates.

In the American cheese districts near Sheboygan where conditions are different the raising of rates and the allowing concentration did not cause the complaints as with us. Of course the small shipper was there also forced out of the business and shipments except in large lots practically ceased. By reason of the many cold storage plants there, cheese from all over this state has been and is concentrated at very low freights and safely kept in storage until orders arrive for shipment in large lots. This system has practically created and maintained the great cheese markets of Wisconsin in Plymouth and Sheboygan Falls which are now the chief distributing points for Wisconsin American cheese for the whole state. Aside from these facts the nearby lake transportation has given those points a rate by rail of 22½ cents to our 28 cents for same distance to Chicago. Of course there was complaint and protest by individual shippers when the rate was enforced at 33 cents but no attention did the roads give to such complaints. But in 1900 this association was formed for the advancement of our interests, and a year or two thereafter this matter of rates was brought up and discussed, a resolution was adopted directing the president to confer with Railroad Commissioner G. L. Rice with the view of obtaining a reduction. It was then found that our laws gave the commissioner no power to change rates, nor much power of any kind to compel just dealing. But he did what he could. There was a conference held at Monroe by all the shippers with the representatives of the railroads at which Rice also was present, and the result was that the roads as a compromise reduced the 33 cents to 28

cents which it now is and which we deem is still excessive compared with 22½ cents on cheese from equal distant points in Illinois (where the R. R. Commission had power to fix rates.) Complaint has also been made that rates are excessive on material shipped in which goes to the making and shipping of cheese. Lead foil of which many thousand of pounds are annually used and which costs 5 to 7 cents a pound is charged as high a rate as tin foil costing 40 to 60 cents a pound. Also that packing paper is charged 29 cents freight to some places and only 13 cents to places beyond and more distant. A rank discrimination. That excessive rates are charged on heavy lumber for boxes and tubs averaging higher from Monroe to Darlington than from Marinette many times more distant. All or nearly all of these complaints are now before the new R. R. Commission of this state. At the last hearing it was proposed that an effort be made by the shippers and railroad men to settle these complaints by a conference to be held during this session in Darlington. I gladly agreed to it on the part of the association and sincerely hope that the differences may be adjusted in a spirit of fairness to both sides.

One more cause of complaint is the abuse of charges in icing cheese cars. Formerly until three or four years ago an extra charge for icing was not known. If cheese was shipped in warm weather all charges were included in the freight rate and no extra charge for ice was made. But somehow extra charges have crept in for amounts not known to the shipper for icing cars in transit, he had no way of verifying the amount of ice charged as having been put in. When such extra charge is presented to the consignee he must pay it and in turn he makes claim on the shipper and the latter is out so much more on the price he billed cheese for. A prominent shipper engaged a refrigerator car in the late fall at a season when no ice was needed, but desired the ice space to be packed with hay to keep the car warm this was done and the hay paid for. When the car reached California and extra charge for icing was exacted of the consignee, of course in such a plain case the shipper made complaint and the extra charges was refunded. This incident I relate

merely as evidence that the shipper knows nothing of the justness of ice charges. There should be one general freight charge covering icing, and then shippers could figure on prices with some degree of certainty.

The state and the United States should have power to provide speedy and just consideration of every complaint against railroads for excessive or discriminative rates and for rebates and favors shown one shipper over another. The rate bills now being considered by congress should first and of most importance make it possible for every complaint to be heard and decided as speedily as a complaint in any court in the land. There is no injustice in the theory that the government should control the rate charges of railroads, for railroads as no other private corporations have delegated to them the government's right of eminent domain, the right without your consent to take and use your property and mine for any purpose in their business and having a price fixed for it if you and they cannot agree. Before the days of railroads the government built highways and charged tolls for their use. Constructed canals and deepened river channels for the better and cheaper carriage of goods, but as a matter of course government cannot build and operate railroads in so great a country as ours as well as private corporations, hence the power to build such roads is delegated to private corporations with all the rights to take and use public or private lands for their right of way, but government has reserved the right in return for such grants to compel the roads to treat those who use them justly in every respect.

So it is to be hoped that the complaints of this association will be considered by the conference in good temper on both sides, with a disposition to be fair and just, so that whatever may be decided it will stand as satisfactory.

Should this conference fail in this, then of course the rate commission will consider and decide our complaints on their merits. It has power to enforce compliance to any reasonable order it may make.

