Thirty-ninth annual report of the Wisconsin Dairymen's Association : held at Neenah, Wis., February 8, 9, 10, 1911. Report of the proceedings, annual address of the president, and interesting essays a...

Wisconsin Dairymen's Association
Madison, Wisconsin: Democrat Printing Company, State Printer, 1911

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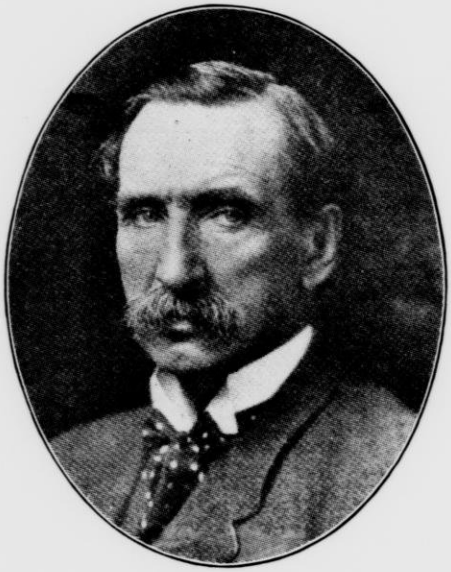

EX-GOVERNOR W. D. HOARD.

One of the Organizers of the Wisconsin Dairymen's Association.

THIRTY-NINTH ANNUAL REPORT

OF THE

WISCONSIN

Dairymen's Association

HELD AT

Neenah, Wis., February 8, 9, 10, 1911.

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

COMPILED BY
A. J. GLOVER, Secretary.

MRS. A. L. KELLY, Stenographic Reporter.

MADISON
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1911

OFFICERS

PRESIDENT,
H. D. GRISWOLD,
WEST SALEM, LA CROSSE COUNTY.

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President 1877.

W. A. HENRY, MADISON, DANE COUNTY
President 1890.

W. D. HOARD, FORT ATKINSON, JEEFERSON COUNTY,
President 1891-3.

C. H. EVERETT, RACINE, RACINE COUNTY,
President 1894-5.

G. W. BURCHARD, FORT ATKINSON, JEFFERSON COUNTY,
President 1896-7.

H. C. TAYLOR, ORFORDVILLE, ROCK COUNTY,
President 1898-9.

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President 1901-3.

CHARLES L. HILL, ROSENDALE, FOND DU LAC COUNTY,
President 1904-5.

W. J. GILLETT, ROSENDALE, FOND DU LAC COUNTY,
President 19 6-7.

F. H. SCRIBNER, ROSENDALE, FOND DU LAC COUNTY,
President 1908-9.

SECRETARY,
A. J. GLOVER,
FORT ATKINSON, JEFFERSON COUNTY.

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SHEBOYGAN FALLS, SHEBOYGAN COUNTY.

CHESTER HAZEN, RIPON, FOND DU LAC COUNTY,
President 1872-74. Died 1900.

HIRAM SMITH, SHEBOYGAN COUNTY,
President 1875-76. Died May 15, 1890.

H. F. DOUSMAN, WAUKESHA COUNTY,
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Z. G. SIMMONS, KENOSHA COUNTY,
President 1879.

C. R. BEACH, WALWORTH COUNTY,
President 1881-82. Died September 15, 1896.

W. H. MORRISON, WALWORTH COUNTY,
President 1883-86. Died December 15, 1893.

H. C. ADAMS, DANE COUNTY,
President 1887-89. Died July 7, 1906.

STEPHEN FAVILL, DANE COUNTY,
President 1886. Died —, 1906.

LETTER OF TRANSMITTAL.

WISCONSIN DAIRYMEN'S ASSOCIATION,
Secretary's Office,
FORT ATKINSON, June 30, 1911.

To His Excellency, FRANCIS E. MCGOVERN,
Governor of the State of Wisconsin.

DEAR SIR—I have the honor to submit for publication, as provided by law, the Thirty-Ninth Annual Report of the Wisconsin Dairymen's Association, showing the receipts and disbursements during the past year, also papers relating to the dairy interests read and discussions had at the annual convention held at Neenah.

Very respectfully,

A. J. GLOVER,
Secretary.

ARTICLES OF ASSOCIATION.

ARTICLE I. The name of this organization shall be the Wisconsin Dairymen's Association.

ARTICLE II. The officers of this association shall consist of a president, secretary and treasurer.

ARTICLE III. The vice presidents of the association shall consist of all past presidents.

ARTICLE IV. The president, vice presidents, secretary and treasurer shall constitute the executive board of the association.

ARTICLE V. The officers of the association shall be elected at the annual meeting and shall retain their offices until their successors are chosen.

ARTICLE VI. The regular annual meeting of the association shall be held each year, at such place as the executive board shall designate.

ARTICLE VII. Any person may become a member of this association and be entitled to all its benefits, by the annual payment of one dollar.

ARTICLE VIII. The executive board shall have power to call special meetings whenever and at such places as in their judgment its interests so demand.

ARTICLE IX. The officers of the association shall perform such other duties as usually devolve upon the officers of like associations.

ARTICLE X. The treasurer shall have the custody of all moneys belonging to the association, and authority to pay out the same whenever an order is presented, signed by the president and secretary.

MEMBERSHIP, 1911

A.

Anderson, G. V., 1004 Majestic Bldg., Milwaukee.
Anderson, Chas., Neenah.
Alexander, J. N., Green Bay.
Anderson, L. W., Neenah.
Anderson, A. W., Neenah.
Aderhold, E. L., Neenah.

B.

Bachman, J. F., Fremont.
Baer, U. S., Madison.
Bergstrom, J. W., Neenah.
Barnett Jr., Dr. J. R., Neenah.
Barnett Sr., Dr. J. R., Neenah.
Blakely, A., Neenah.
Beyer, J. M., Menasha, R. 12.
Bidwell, W. E., Neenah, R. 11.
Babcock, H. K., Neenah (2).
Blodgett, C., Neenah.

C.

Cannon, S. D., Neenah.
Clark, C. B., Neenah (2).
Cook, S. A., Neenah.
Clark, W. H., Rice Lake.
Chenevert, Mrs. M., Neenah (5).

D.

Durge, S. F., Neenah.
Defnet, E., Neenah.
Dennhardt, J. H., Neenah.

E.

Eldridge, A. D., Neenah.
Elwers, F., Neenah.

F.

Freeman, L. H., Neenah.
Freweger, Wm., Neenah.
Frank, H. J. & Co., Neenah.
First Nat'l Bank, Neenah (5).
Fritzen, F., Neenah.
Fisher. H. A., Neenah.
Freweger, J. L., Menasha.
Faas & Miller, Neenah.

G.

Gellingham, F. J., Neenah.
Goodrich, C. P., Ft. Atkinson.
Griswold, H. D., West Salem.
Glover, A. J., Ft. Atkinson.
Grove, B. B., Neenah.
Greenwood, Dr. S. B., Neenah (2).

H.

Haase, C., Neenah, R. 10.
Harper, H. E., Neenah, R. 9.
Hansen, H., Neenah.
Hunt, J., Neenah.
Hahl, Wm., Neenah.
Hough, A. J., Neenah.
Hauson, J. Co., Neenah (5).
Harford, F., Kaukauna.
Harris, R. T., Madison.
Hoard's Dairyman, Ft. Atkinson.
Harness, J., Neenah, R. 9.
Harder, S., Neenah, R. 11.

J.

Jorgenson, J. E., Neenah, R. 11.
Jennings, A. A., 4 Sherman St., Chicago.
Jensen, H. P., Neenah, R. 8.
Jensen, C. W., Neenah, R. 8.
Johnner Bros., Neenah.
John, F. J., Neenah, R. 11.

MEMBERSHIP, 1911—Continued.

Jandrey, E. E., Neenah (2).
Jacobson, E., Green Bay, R. 7.

K.

Kalfahs, G., Neenah.
Krahe, L. W., Neenah.
Kimberly, J. C., Neenah.
Krueger & L. M. Co., Neenah (5).
Kuehl, O., Neenah.

L.

Lake, F. D., Menasha.
Langnor, C., Neenah, R. 11.
Larson, N., Neenah.
Ladd, P. J., Neenah.
Lentregger, J. J., Neenah.
Lawson, P. V., Menasha.
Lenz, G., Neenah.

M.

Meulemans, L., Kaukauna.
Mason & Nagle, Neenah.
Mattart, E., Neenah, R. 8.
Manzer, E. J., Plainfield.
Miller, A., Neenah, R. 8.
Mott, Mayhew, Neenah.
Michels, M., Peebles.
McAllister, A. O., Neenah, R. 9.
Marquis, F. L., Neenah.
Martin, C., Neenah, R. 10.
Marsh, C., Neenah.

N.

Nelson, C. W., Neenah.
Nat'l Mfg. Bank, Neenah (5).
Newell, H. M., 302—15th St., Milwaukee.
Nelson, J., Neenah, R. 10.

O.

Ora, Mrs. H. F., Manawa, R. 2.

P.

Phillips, M., Kaukauna, R. 13.
Pride, E. B., Neenah.
Pierce, G. P., Menasha.
Ringel, J., Neenah.

R.

Retzlaff, H., Neenah, R. 8.
Race, O. H., Oshkosh.
Rasmussen, C. C., Neenah, R. R.
Raddick, E. C., Neenah.
Raddick, N., Neenah.

S.

Stone, J. N., Neenah.
Schueller, J., Neenah.
Sund, C. T., Neenah.
Schmid, G. Neenah.
Smith, Mrs. H., Neenah.
Schaefer, R. J., Appleton, R. 1.
Scribner, F. H., Rosendale.
Sensenbrenner, F. J., Neenah (2).
Shattuck, S. F., Neenah (5).
Stroebel, J. F., Neenah.
Schultz, C., Neenah.
Sorenson, C., Neenah.
Syme, D. H., Glenwood.
Searles, H. C., Fond du Lac.
Strange, A. N., Menasha.
Strange, Wm., Menasha.
Smith, C. R., Menasha.
Smith, H. S., Menasha.
Stitgen, J. B., Menasha.
Sturer, J., Neenah.

T.

Todd, Dr. S. G., Neenah.
Tuchscherer Bros.
Thomas, J. H., Eldorado, R. 10.
Thompson, C. L., Neenah, R. 10.
Thompson, E., Allenville.

U.

Ulrich, G., Neenah.

MEMBERSHIP, 1911—Continued.

V.

Vogt, J., Fremont, R. 2.

W.

Walter, J., Menasha.
W. T. L. H. & P. Co., Neenah,
Williams, E. A., Neenah.
Whiting, F. B., Menasha.
Welles, M. L., Rosendale.
Williams, C. E., Genoa Jct.
Wing, W. C., Neenah.
Wickert, A. H., Neenah.
Williams, W. R., Neenah.
Wilcox, C. R., Neenah.
Wilson, A. C., Neenah.

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS

OF THE

Wisconsin Dairymen's Association

AT THEIR

THIRTY-NINTH ANNUAL CONVENTION

Held at Neenah, Wis., February 8, 9 and 10, 1911.

President H. D. Griswold in the chair.
Prayer by Rev. F. J. Turner.

ADDRESS OF WELCOME

MAYOR MAX WERTZ, Neenah, Wis.

RESPONSE

EX-PRESIDENT F. H. SCRIBNER, Rosendale.

Mr. Scribner called to the chair.

PRESIDENT'S ADDRESS.

Ladies and Gentlemen and Members of the Wisconsin Dairymen's Association: I am glad to meet you once more at this, our thirty-ninth annual convention. I wish to thank the mem-

bers of this Association for the honor conferred upon me at the last annual meeting. I feel my inability to do justice to the position, but am willing and anxious to do all in my power for the best interest of the dairy business in this great state of Wisconsin.

Some who have been wont to meet with us on these occasions will not be here today. We shall miss them and feel a touch of sadness that we shall see them no more. We are glad that we have known them and our lives are richer and better for their influence—notably, Charles Linse of LaCrosse.

From earliest history the production and use of milk has been regarded as a necessity and a luxury. We read that when Abraham entertained the angels that came to him, he set before them milk and butter of kine. And the promised land to the children of Israel was a land flowing with milk and honey.

Wisconsin is a land of milk. Wisconsin, with its hills and valleys, its pure water, its luxuriant grasses, its delightful and invigorating climate, its energetic and intelligent farmers, is especially adapted to the dairy industry.

Milk is a perfect food in itself, and when a babe is born and the mother cannot nourish it, the dairy cow is the source of the food supply; and when old age comes on and all other food is rejected, milk still remains. No other article of food fills so large a place on our tables as milk and its products.

The value of milk as a food is not fully appreciated. More milk and less meat is cheaper and healthier and the increased consumption of milk and cream in our cities shows that people are beginning to realize this fact. The census just taken shows that our population is increasing very fast in our cities, but not on the farms. This means more consumers, for all must eat, but the number of producers has not increased. This means good prices and a demand for our products that will compel us to do our best if we are to supply the consumers.

The laws now in force requiring cows to be tested for tuberculosis and the inspection of dairy herds insure to the consumer a pure article, thus giving confidence to the public

and an assurance of good prices and a stable and enduring business.

We are justly proud of our state in the value of its dairy products, in the last year amounting to more than $79,000,000. We are proud of the fact that we have more pure bred dairy stock and more silos than any other state in the Union; and the splendid records that have been made and are now being made in this state of ours. And yet the number that is doing such good work compared with the whole number of dairymen is small. We still have a great army of farmers who are keeping poor stock poorly housed and poorly fed.

Our farmers' institutes and our agricultural schools have done much to enlighten these men, but there is still a great work to be done.

Our Dairymen's Association is so limited in its appropriation for this work that we are only able to keep one man in the field to go among the farmers and do personal work; to get them to form test associations and breeders' associations and co-operate with each other in this work of better dairying. It seems to me that the state could spend money no better or more wisely than in sending out competent men to interest the farmers in grading up their herds and discarding poor stock; in right ways of stabling their cattle and intelligent feeding.

The law requiring all cattle to be tested for tuberculosis, that are sold for breeding purposes, is one of the best for the interest of the farmer that has ever been enacted; it protects him from unscrupulous dealers and will, if continued, eliminate the disease from the state. And if our state can have the name of having stock free from that disease and coupled with that of the best stock in the land, we will have an industry in raising dairy stock which will be second only to the milk product.

Soil conservation is a subject now that we must not lose sight of, and the dairy cow above all things else is the machine to upbuild the exhausted soil, to return to the soil the fertility removed in the crops. She it is that enables us to rotate the crops to the best advantage; to use the clovers and alfalfa

and return the fertility to the soil; to utilize the land too broken to plow and make all things contribute to prosperity and peace.

The Chairman: I am sure we could spend a few moments profitably in the discussion of this paper, and I will ask Mr. Glover to lead.

Mr. Glover: Mr. Chairman and Gentlemen: Before I take up any topic suggested by the paper, I just want to remind you that this is your meeting, and that if you depend upon the officers to entertain you, you will not get nearly as much good out of it as if you take an active part. We have tried to get speakers who are practical as well as scientific, men who can be of all-around assistance to us in the discussion of problems connected with dairying and the fundamentals of farming. I have heard men say, "I don't want to ask questions in a meeting because I will show my ignorance." I am not very old, but I have already found out that the wise man asks more questions than the stupid one. I simply make these suggestions so that you may feel at home; if somebody makes a statement with which you do not agree, get up and say so; don't hold back and wait for the other fellow. Let us get the most possible out of this meeting.

I was asked to start a discussion on the president's paper. He said our present law relating to the governing of tuberculosis was going to be a wonderful help to Wisconsin, a big advertisement. If Wisconsin could send broadcast throughout the land the statement that there was not a single case of tuberculosis in the state, it would be worth millions to us. Still we hear farmers discussing that question and objecting to the tuberculin test. To be sure it is not infallible, it is not fool-proof, never will be, any more than scales are fool-proof. Did you ever feel that you were not given the right weight on a load of grain or hay? Of course you have. It makes a difference who balances the scales and so it makes a difference who applies the tuberculin test, but just the same it is the most accurate diagnosis that we have for tuberculosis. I do not feel there is very much danger of grown people getting

tuberculosis from drinking milk, but I know there is danger of tuberculous animals transmitting the disease to other animals. We never know when an animal is diseased. If any criticism is to be brought against the tuberculin test, it is that it is too accurate; it will reveal cases when the development of the disease is so slight that the great probability is that the animal will recover. It does not tell you how badly or where the animal is affected. If she is affected in the lungs sputum becomes infected, and there is great danger of its spreading the disease.

I want you to ask yourselves this question, Would you put a cow that had tuberculosis in your herd, if you knew it? Would you drink the milk from a cow that you knew had tuberculosis, notwithstanding she might not be dangerously affected?

The Wisconsin law does not force any man to test; none of you are obliged to test and you don't have to sell any of your cows, but the law simply says that if a man wants to sell a cow for dairy or breeding purposes she must be tested. The law does work a hardship in many cases, but can you mention a law that has been passed that did not work a hardship upon somebody? The auction sale has been a common way of disseminating the disease. Tuberculosis is discovered on a farm; the owner gets out a circular advertising an auction sale; announces to his neighbors that he is selling out. The real reason for his selling is to get rid of his tuberculous herd, and the innocent man goes to that auction, buys some of these animals and takes them back to his farm, and first thing he knows his whole herd is infected. The law was passed to try to stop that kind of practice, but they couldn't stop that without stopping any one from selling a diseased cow for dairy or breeding purposes. But now suppose you test your herd and find some that react, but still you have good reason to believe that your herd is healthy. In that case I wouldn't sell them; I would separate the animals that reacted from the healthy ones, and then in sixty days I would retest them. Even then if they were valuable breeding stock, and reacted on the second test, I would build a barn or shed for them and

raise their calves. The calves should be separated from their mothers as soon as born and fed on pasteurized milk. The germ is killed at 150 to 160 degrees Fahrenheit. It is a little troublesome, but you can in this way raise healthy calves from tuberculous cows and build up a healthy herd. Of course mistakes are sometimes made in making the tuberculin test; it is not infallible, but only 3 per cent of all reacting animals have been found healthy upon slaughter.

Mr. Aderhold: Does this law forbid the sale of cattle for slaughtering purposes, or for shipping outside the state?

Mr. Glover: No. It applies to animals sold for dairy and breeding purposes.

Mr. Loomis: Or for taking the milk to a creamery or a cheese factory?

Mr. Glover: No. The tuberculin test law has nothing to do with selling dairy products. The Dairy and Food Commission is given the power to regulate the selling of milk from diseased cows.

Mr. Blakely: The gentleman speaks of cows recovering from the disease. Tell us something about that.

Mr. Glover: Well, of course I don't know the reason any more than I know why some people recover from it. Two years ago the engineer employed by the W. D. Hoard Co. was affected with tuberculosis. A sputum analysis was made, and it showed the germs of tuberculosis. He asked for leave of absence for six months to live on a farm in the open air; he led a quiet life and returned in about nine months as healthy as ever. He gained in weight thirty or forty pounds and now seems to be all right.

Mr. Aderhold: I understand that those animals sold for dairy or breeding purposes must be tested, and I think the law forbids not only the sale of such animals, but also the buying of them, unless they are tested. In this country we have had some very good lessons along this line; we have seen some herds almost wiped out by tuberculosis, and in one case a very valuable herd of pure breds. In a herd this side of Waukesha, fifty-one head were tested and twenty-six responded and were taken away. A little over two years after that, in the

same barn, sixty-two head were tested and thirty-four responded. Tuberculosis is a dangerous thing to have in a herd; no farmer can afford to have it. We know something like 3 per cent of our live stock has tuberculosis. No one with good sense would bring an animal into his herd that he knew was tuberculous. As I say we do know that three per cent of our live stock is tuberculous. Now, are we going to let them mingle with the healthy animals and keep the disease spreading? It will be a far cheaper method to get rid of the three per cent entirely than to spread the disease, even though it must necessarily work some hardship. In this county, several years ago at Winneconne, at the Agricultural School, they slaughtered a number of animals and the eyes of the farmers of Winnebago county were pretty well opened up, and thousands of animals were tested following that experience.

At a cheese factory, a few miles from town here, a meeting was called and a resolution was passed that no milk would be received at that cheese factory except what came from tuberculin tested cows, and they enforced that rule so each one of the members of the cheese factory organization had his cows tested. I understand that on two or three of the farms there were reactions but not many, not over one or two at a place. In that way the community, through this sensible method, got rid of the disease and prevented the spread of it through the medium of the cheese factory, a danger in many places.

Mr. Scribner: Yesterday we shipped out of our town a carload of reacting cows, picked up here and there, one in a place, possibly two, throughout the community. They were shipped to Milwaukee for inspection and quite a number of the farmers went with their cows to see them slaughtered. There is a good deal of misunderstanding about this test. Some people seem to think it is not to be depended on; some think, as Mr. Glover suggested, that it is going to hurt the cows and sometimes we hear the claim that it is going to bring on tuberculosis in some way.

Now, we have been keeping a milk record in our barn for twenty-five years; the milk sheet is hung up in the barn, and

it is a wonderful help to us because it tells so many things. We weigh our milk every night and morning, and of course we weigh it right through the period of tuberculin testing which we make regularly, and it shows that the test has absolutely no effect on the milk flow. No harm comes to the cows undergoing the tuberculin test. Our cows have not lost any butter or butterfat in all these years of testing and in my long experience I can see no harm whatever in the tuberculin test. I know a great many have found fault with it because upon some of the animals slaughtered no signs of the disease were found whatever. But the reason of that is very clear, the whole carcass is not inspected. The inspectors look it over and if they find the meat diseased, it is condemned, but if they only find a few lesions in the glands of the neck, or the throat, or in the liver, the inspector passes it, because the part used for food is all right. Sometimes with the inspection they give it they do not find any disease at all, but I feel sure it is there somewhere in the animals which have reacted, perhaps in some joint, some bone, or some place where they have not discovered it, but it is quite certain to be found somewhere and liable to become worse.

The herd should be tested every year, at least every two years after no reactions have been found for several years, and that only in case no new animals were brought into the herd.

Some two or three years ago I went to Milwaukee to attend an auction sale. The animals looked very healthy and the barns were in a very sanitary condition. I bought twelve of those cattle and took them home and tested them, and every one reacted. What induced me to test that bunch of cows was that one of them acted as though she had caught cold; she commenced to run at the nose, her hair began to look rough and her head and ears drooped. I said, "Boys, we better test that heifer." We did test her but she showed no reaction. I wasn't satisfied with that test, so slaughtered her and we found the lungs of that heifer absolutely rotten. Now, suppose, when that heifer did not react, I had said to myself, "All right, we will keep her in the herd."

You must take into consideration, in connection with this

test, the physical condition of the animal; you can't always go by the test alone, because the animal may be so badly run down, so far advanced in the disease that the test will not work. If I had left that heifer in the herd all my cows would have been affected and I would have lost them. A man on the train said to me yesterday, "My cow had tuberculosis and reacted on testing. I feel sure that she got it from my neighbor's cow that used to stand at the fence as she slobbered at the nose, and my cow would go up to her and they would sniff at each other over the fence, perhaps pick at the same grass. There is a good deal of risk in this fence business. If I were very careful in testing my herd which ran in a field with just a line fence between that and another field where there was an infected herd, I would take steps to keep their heads apart. It is finally working around to the point where the only real just thing to do is to have every animal tested in the state. We have been making this an educational affair for some time, trying to inform the farmers about the wisdom of the test and we feel that we are getting up to where every animal that is sold must be tested.

I remember very well the first time I tested my herd, I had been thinking about it for some time; we were carrying up to the house about six quarts of milk every day and I was asking myself if this milk that I was feeding to my children was all right. It kept worrying me and my wife until we felt obliged to test, and I tell you when we found no reaction I felt like jumping up about three times and yelling, I felt so good. We had the satisfaction of being sure that our herd was all right; the milk absolutely clean and healthy for our children and other people.

Mr. Loomis: Are you acquainted with the circumstances of this testing in Sheboygan County?

Mr. Scribner: It seems there was a case in the eastern part of the state, where a number of animals died and it was claimed to be from an injection of tuberculin. These animals had been tested for blackleg and the same serum was used for the tuberculin test which poisoned them in some way so that they all died. I think there were six head. A good deal has been said about that incident, but that did not result from the tuberculin

test at all; it was simply a careless job done with filthy instruments.

Mr. Griswold: I think it is a fact that in a test of any kind, or any diagnosis, mistakes have always been made and as few errors have been made with the tuberculin test as in anything of the sort. Considering the amount of stock tested in our state last year, 48,000 head, it would certainly be remarkable if no mistakes had been made in testing that large number.

Mr. Glover: Gen. Burchard, associate editor of Hoard's Dairyman, has a farm, and a year ago he had his herd tested. One animal reacted. He thought it a little strange, and he wrote to Madison about it. In the meantime he separated that animal from the rest of the herd. He has had a hand separator on his farm twenty-five or thirty years and used no skim milk for his calves except from his own cows and as he has purchased no animals, he thought it strange that one heifer raised on skim milk and in a barn that never had tuberculosis in it should have the disease; so in seventy days, or such a matter after he had separated her from the herd, he retested her and found her to be all right.

Mr. Melth: I believe that in order to get rid of this disease we will have to send competent men around. We must clean out the whole thing.

Mr. Griswold: It would be impossible to get testers enough to test all the cattle in the state at once, and it would be impossible to get enough tuberculin to test all the cattle at one time, and the state would hardly want to pay for all the diseased animals at once, so it must be a matter of some little time.

Mr. Scribner: I wonder if you understand that possiby one animal may rise in temperature as high as another and not be condemned. They have what they call a tuberculous curve which commences with normal temperature and gradually works up to a high point and gradually down again. They follow that up to the highest point and back to normal temperature again. Now, that animal would be condemned. Here is another animal that is tested, she comes to perhaps the second or third stage of temperature and just as high as this other cow did, yet she would not be condemned, because some-

thing else in her physical condition caused the rise in temperature which would be considered suspicious. She should be held sixty days and retested. The chances are something else has entered in; a man must know his animals and use judgment. We ought to have a good knowledge of how this test is carried on, because if we have a man test our herd, we ought to be able to rectify any mistake he might make. For instance, an animal must not be tested unless she is in normal condition. If a cow is due to freshen, for instance, she ought not to be tested. She may be off her feed, etc. If she is, do not test her. An owner ought to be on hand and ought to know the condition of each animal and to say, for instance, "this cow has not been eating good for two or three days; she ought not to be tested."

A Member: The farmer is not allowed to test his own cattle, is he?

Mr. Scribner: Yes. You may test your herd, but you must notify the Live Stock Sanitary Board, if you do.

A Member: Do the men that test cattle have licenses?

Mr. Aderhold: Yes; you can find out from the Live Stock Sanitary Board who is doing testing around here.

Recess to 1:30.

The convention met at 1:30 p. m., same day.

President Griswold in the chair.

APPOINTMENT OF COMMITTEES

By the Chair.

Auditing Committee: E. L. Aderhold, Neenah; E. Defnit, Neenah; H. C. Searles, Fond du Lac.

On Nominations: C. P. Goodrich, Fort Atkinson; Math. Michels, Peebles; M. L. Welles, Rosendale.

On Resolutions: F. H. Scribner, Rosendale; W. H. Clark, Rice Lake; A. W. Anderson, Neenah.

HANDLING AND PRODUCING HAND SEPARATOR CREAM.

MATH. MICHELS, Peebles.

Of late years, we have heard much about the poor quality of butter found on the market, and it is an undisputed fact that a large amount of this trouble can be traced to the improper handling of the cream from which the butter was made, and the hand separator which skimmed the cream. I do not want to be understood as saying that I condemn the use of the hand separator or this system of separating cream, but rather the abuse of this system. There is no reason why the quality of butter made from hand separator cream should not be equal or even superior to that produced from cream skimmed at the creamery, provided the hand separator cream be given as much attention as must be given to milk that is delivered to the creameries.

No buttermaker will hesitate to reject milk that arrives at the factory in a slightly sour condition or is otherwise off, but when a patron delivers sour or bad flavored cream, he is generally very slow in refusing it or even advising him of its poor qualities. This is not a theory but a condition that I know exists. I am unable to account for this reluctance on the part of the buttermakers unless it is because cream patrons find it easier to jump from one creamery to another than those who deliver milk, and the buttermaker is more afraid of losing them.

CARE OF THE SEPARATOR.

As a dairy farmer, using a farm size separator, twice a day the year round, will say that it is a very easy matter to so handle the separator that it is clean and bright at all times.

Our milk house in which we do all our separating, both summer and winter, is equipped with a 1½ H. P. gasoline engine to drive the separator. We also have in this house, which is 18x20, our Babcock tester, glassware, scales, and a tank for cooling.

My youngest son, twelve years of age, does all the separating, weighing, cooling of cream and cleaning the separator. As soon as we have sufficient milk to make the run without stopping he puts the separator together, gets up the speed and starts separating while the rest of us finish milking. After skimming, the bowl is flushed with skimmilk to recover all cream that may still be in the bowl and cream pan, and as the speed goes down, but before the separator stops, he runs two or three quarts of cold water through it. This water will loosen but not discharge all slimy matter that may have accumulated in the bowl. As soon as the separator stops he washes the bowl, first with cold water then with warm water, and finishes by pouring hot or boiling water over all parts and hanging them up to dry where they remain until the next skimming. For the sake of the life of the machine, as well as the quality of the cream, the separator must be washed as often as used, and when done regularly and thoroughly, this will take but a few minutes of time as all parts will be smooth and bright at all times. One that is washed only once a day is always hard to clean because the slime dries and adheres closely to the parts. This also shortens the life of the machine, for one that is not washed regularly will soon rust and deteriorate and requires frequent retinning and repairs. I am satisfied that it is worth more than the extra time spent in washing (if it takes any extra time at all) for the good of the separator alone, say nothing of the better flavored cream produced which is of first and all importance.

Care of Cream.

As soon as the cream is separated it is cooled, and after the washing and other work is done, it is put into the delivery can. The can in which the cream is kept should always set in a tank of water. If possible, all water used for stock should be pumped through this tank to keep it cool in summer and to keep from freezing in winter. We have spring water which runs the year round. The cream should not be changed again into other cans, but go direct to the creamery in this can.

The common practice of gathering cream in large cans is all wrong, and as long as it is continued, the best quality of butter

will never be made. All cream should be gathered in individual cans. There should be two sets so the cream hauler may simply pick up the full cans and leave the empty ones. All weighing and sampling should be done at the creamery where the cans should also be thoroughly washed and steamed.

In order to get all the cream, it is well to use a small platform covered with tin that will drain into the cream vat or weighing can and connected with a steam jet. Over this jet, the cans can be placed and the steam turned into them which will thin the cream sufficiently to allow all of it to drain out.

The following are my reasons for making the above statements:—

First—If we are looking for the best grade of butter, we should separate a cream testing from 30% to 35% of butterfat. A cream rich in butterfat will make less bulk, hence is easier to handle and cool. But a rich cream is very sticky and cannot be sampled and weighed accurately on the road, and altogether too much cream remains in the farmers' cans after the hauler has taken all he can get. This large amount of cream often tempts the farmer to add the next cream to the can without washing and thereby save the cream that was left in the can.

Second—The sampling and weighing of cream on the road is very unreliable and unsatisfactory, especially so in rainy or freezing weather. This work can be done at the creamery with much more ease and accuracy and it has the additional advantage of allowing personal inspection of the cream by the buttermaker. It also keeps the farmers in better humor, as a constant wrangle regarding weights and tests will surely result in a dissatisfied patron and a dissatisfied patron will never give his cream the best possible care.

Third—Rich cream will not churn or sour as easily when gathered as will the cream which tests low in butterfat. Rich cream can not only be handled safer, but can be hauled without floats and it is not necessary to have the cans full, provided a good spring wagon covered with canvas is used.

Furthermore, a cream containing a low percentage of butterfat is more bulky, takes more cooling, sours and goes off flavor more quickly and besides all this, the farmer is giving away a part of his skimmilk every day.

Another point I wish to make in favor of a moderately rich cream, is that there is less loss in the buttermilk. It also gives the buttermaker a chance to use a reasonable amount of starter which is necessary to attain the best and most uniform results. As soon as the cream is all in the vat, the starter must be added and thoroughly mixed while the temperature is raised or lowered to about 65° in winter or about 60° in summer, depending somewhat upon the acidity of the cream when received. A limit of .50 or .55% should be placed on the acidity of the cream before churning.

DISCUSSION.

The President: Mr. Michels speaks about keeping cream by letting water run through the tank. That is all right where a man has a cold spring of water, but where he has only a windmill,—there are apt to be several days at a time when the windmill does not run—the water is apt to get a little too warm for that purpose. We have been handling cream and sold some of it to a very particular city trade. We have no spring water, but put up ice and use it all the year around practically, because in the winter time when we do not use ice, we use snow. Our idea is to cool off the cream just as quickly as possible after it is separated and to separate it just as quickly as possible after it is drawn. We don't wait until it is convenient to do either the separating or putting it in the ice water, but make it our special business to get the cream into the ice water as soon as possible, so that it is thoroughly cooled off before we ship it. The man in La Crosse to whom we ship it tells me that what is left over the first day he takes home and puts in his ice box and that he can keep that cream sweet three days in the hottest days of summer. It is simply a matter of keeping the cows and the separator and everything else absolutely clean and cooling off the cream right away, and if every farmer would follow that rule, there is no reason why they should not all have a good cream.

Mr. Searles: Do you pour the warm cream in with the cold as fast as it is separated?

Mr. Michels: No, we cool the cream first. I don't think it is a good idea to add warm cream to the cool cream; it develops a peculiar flavor which we do not like for butter making, and still less for ice cream making. I agree with Mr. Griswold that it is much better and safer to cool with ice than with water, although where proper arangements are made for pumping well water, fresh every day for the stock, it might do. It will not do to depend on the windmill. Most of us have gasoline engines and do not depend on the windmill, even though we have it on the farm.

Mr. Searles: What per cent of fat does your cream contain?

Mr. Michels: At the creamery, I used to like to get it somewhere between 30 and 35 per cent, although some run up to 50 per cent and others down to 25. As a buttermaker, I would not want low testing cream. It is not possible to get the cream in as good shape and turn out as good a product as if you had higher testing cream, because it doesn't give the buttermaker a chance to use a starter when the cream is too thin. That is more important to the buttermaker than many of the farmers have any idea.

Mr. Scribner: Will Mr. Michels state where the chief objection lies in making a first class quality of butter as related to the separator?

Mr. Michels: I think there are three points. In a good many articles we read, they simply jump around the question. In the first place, this matter of separating once a day only is all wrong, and we know that is the practice almost everywhere. It should certainly be done at every milking. No driver can pick up all sorts of cream and put in one big can and then expect the buttermaker to make a first class article of butter.

Mr. Glover: Would it be better if the cream were gathered every day?

Mr. Michels: I do not think that is necessary. It is all right to gather it every other day, if it is in the proper condition.

Mr. Scribner: I think it would do every man a whole lot of good to ship cream to the city for a while, because then he is bound to learn just how he must keep it. Our cream goes to the city every day, except that we have no Sunday train and the cream separated on Saturday evening is not

sent until Monday, and some of it is held over until Tuesday and sometimes Wednesday, and it is all right. This proves that we can handle cream with the separator on the farm if we look out for the conditions. We can't expect to run sweet, clean milk through a dirty, old separator, or to run dirty milk through a clean separator and have it come out right. I have seen people slobber their hands in the milk and expect to get a good article of cream out of it, and we all know it is impossible. It may be rich in a certain kind of fertility, but it isn't good cream.

Mr. Michels: It is very easy to lay all the fault to the hand separator, while a good many times the fault is right in the man at milking time, or some other time in the process. A good many buttermakers get in the habit of putting all the blame upon the separator, but in a good many instances it doesn't belong there. I have been in half a dozen or more places the last week, and in but two of those places were they using a separator. I believe the time is coming when we will see that the proper use of the separator is a good thing and will not listen to those who are discouraging it.

A Member: Some people are certainly discouraging the use of the hand separator. I separated my cream and delivered it to the creamery but was not satisfied with the returns. The test was far below what I was getting at other places and the creamery man said he would send a sample of the milk and the cream to Madison and have it tested, but I never got any report and according to his story, it was never tested. I thought his test ought to correspond with the test I was getting other places, and I also thought I ought to get the reports from Madison.

Mr. Michels: Did you haul the cream yourself?

The Member: Yes.

Mr. Michels: I know hauling is a pretty hard proposition especially in the rain and in freezing weather.

A Member: Does it happen at Madison that samples are never tested?

Mr. Michels: Not wilfully. There are a lot of samples that come there broken. They are reported, of course, unless there is no name. I have seen samples there, also bottles of

milk and cream with no names attached, so nothing could be reported.

Mr. Aderhold: When a man is selling cream, don't you think it is a good idea for him to do a little testing himself?

Mr. Michels: Most certainly. I would always want to keep track of it and know the test myself, and it is as easy to test cream as it is milk. All you have to do is to get a scale, and you can tell whether your cream is being tested right within 10 per cent, with a pipette.

Mr. Aderhold: I have been in communities where a great deal of dissatisfaction existed. When a man is taking milk to the factory, of course there isn't very much fat in the milk compared with cream. Even if the man at the factory wanted to be crooked, he couldn't change the milk test very much without somebody knowing it had been changed. But anyhow, it is a good plan for the farmer to do some testing, even where he takes his milk to a factory. When it comes to selling cream, there is a chance to make a big variation in the test and still show it is pretty rich, especially where a man is shipping cream. Take these fellows like Mansfield & Company and the centralizers, they want their cream rich, sometimes it is up to 40 per cent. Now, they can take a good figure off of that and still make a high test, so in all cases it is advisable for a man who is shipping cream to know enough about testing to keep track of where he is at, and that for two reasons: he will satisfy himself that things are all right, and if the other fellow knows you are testing, he isn't nearly so apt to try to fool you. If a man is inclined to fool anybody, he is going to fool the fellow that doesn't know he is being fooled. Three or four farmers can go together and get a tester and so know what they are doing and what their cream is testing.

A Member: Can you run two batches of milk through a separator, and get two different tests from the cream?

Mr. Michels: Yes, you can, even from the same milk; that is, the cream may be thinner in one case than in the other, and there may be quite a wide difference, especially if different people are running the machine. One man may turn the separator at a higher speed than another, and the temperature of the milk may vary, and either affects the richness of the

cream. Even if the same man were running it, there would still be the question of temperature. The warmer the milk is, the more cream you get from it. If you turn the separator yourself the first half of a milking and then let somebody else take the second half, and test them separately, you will be surprised to see how much variance there will be. I have found as much as seven or eight per cent difference under those circumstances.

The President: I would not be without a tester myself, nor without testing my cream for myself. In sending cream to the city, I have received a report that my cream was getting thin; in fact, I find that a report is apt to come around just about so often. Before there is any occasion to get mad about it, I get my tester, take a fair sample and test it, and then we know whether it is getting thin or not, and if it is not, their saying so doesn't make it thin, and if it is getting thin, we change the separator, and bring it up where we want it. I remember one time when the report came to me that the cream was thin, I had not changed the separator in any way; there was nothing I could think of that would make any difference, and I simply didn't believe it, but before I answered, I got a sample and tested it and sure enough it was down, and to this day I don't know why. Another time, I found it was running considerably higher—of course there was no kick coming then, I had to look out for that myself. But by having my own tester, I keep track right along of what I am doing and every farmer ought to have a tester and know for himself what he is doing.

Mr. Aderhold: When your cream run too low, how was that, did you change the separator before the other fellow commenced to kick?

The President: I always intend to do the fair thing, and if I find the cream too low, I put the separator up to where it belongs as soon as I discover it. It goes now entirely by the tester, so that if it runs lower or higher, I get credit for it, or vice versa.

Mr. Scribner: There is one point strongly in favor of the use of the separator on the farm, and that is the skimmilk. I wouldn't any more think of going into a factory and taking the skimmilk from a lot of strange cows than I would think

of getting into a flying machine. It is a great thing to have all your own skimmilk for your calves, and I am sure that helps keep disease out of our herds.

Mr. Aderhold: You spoke about washing the separator twice a day. Does it require much more time to do that than to wash it once a day?

Mr. Michels: No, I don't think it takes any more time to wash a separator twice a day than to wash it once, because it is so much more easily washed, and then it never turns black as it will if kept over the two milkings without washing. Any man that goes around the country can tell by looking at the separators, whether they are washed once or twice a day from the dark color; you can't keep it bright, washing it only once a day.

Mr. Aderhold: And very often they do not smell good after they are washed but once a day.

Mr. Goodrich: May I be allowed to talk just a minute or two?

The President: Yes, just as long as you want to.

Mr. Goodrich: I haven't said anything for a long time. Now, as I understand it, Mr. Michel's paper has more reference to furnishing cream to creameries than for city trade. The great kick from the creameries has been that they could not make as good butter from gathered cream as they could from whole milk. Down in the southern part of the state where the creameries are close together and work up whole milk, some men commenced to bring cream and they objected to it; they didn't want part milk and part cream, and said they couldn't make as good butter from gathered cream, just because they didn't want to be bothered. Now then, we know that they can make just as good butter from gathered cream separated on the farm as they can taking the whole milk and separating it at the creamery. The trouble came right in here, the patron of the whole milk factory realized that they could not use sour milk and so he took care of his milk so it would not be sour. Unfortunately he knew a little more, he knew they could make butter out of sour cream, and so he let it sour; he didn't take care of his separator. The creamery men accepted that cream just the same and so they were to blame for it. They ought to reject poor cream,

but we all know why they do not. If they reject it, the patron runs right off to another creamery, so the creamery man is very careful not to find any fault, not say anything that will drive away his patron. I heard a patron say when the creamery man found fault, "If you don't want it, I know who does," and the creamery man shut up his mouth tight, never said another word. The creamery man could regulate that thing if he had the spunk.

I have been around a good deal; one of my sons ran a creamery, and some pretty poor stuff was brought there. Finally, he shut down on the poor stuff. He paid a higher price for butterfat than any other creamery around there, but he shut down on the cream if it was bad, he wouldn't take it. He stuck to it and for that very reason he made butter that brought such a price that he could afford to pay three cents a pound more for butterfat than the big centralized creameries near him. Now, I am going to tell you a little incident. He had teams out gathering cream, and frequently he used to go himself, and I went with him quite often. One day we stopped at a house and nobody was at home, but he knew where they kept the cream. He looked at it and said, "I can't take that cream." Right there was the separator; it had not been cleaned at all that day and the cream smelled bad. He wrote on a card, "Your cream isn't good and I can't take it. You haven't taken care of your separator and you haven't properly cooled your cream. I can't use it." He tied that card onto the can. Two days after that, when the regular cream hauler came to that house he asked the woman if she had any cream and she said, "No, I haven't any cream for you. You said my cream wasn't good, and I know it is just as good as anybody's; you need not stop here again." After that he drove right by that house, didn't even look that way. But about two weeks afterward when he went by he saw the woman looking out the door rather anxiously. He looked the other way, whistling and singing. She called to him and said: "I have some cream for you." Well, the cream was fine and good and it was good ever after that. Three cents a pound more will bring most anybody to time.

Mr. Glover: Mr. Goodrich is eighty years old to-day and he has a right to give us a little fatherly advice.

The President: I want to tell of a little incident that occurred this winter in the western part of the state. A buttermaker had taken first premium at one of the shows for creamery butter and that bunch of farmers was very proud of the fact that their buttermaker had taken the premium. The buttermaker hadn't said very much about it, but he sprung quite a surprise on them at the institute shortly after. He had a paper on "Taking Care of Cream." In part he said, "Yes, I got the prize, but if I had taken the cream from all the patrons, made my butter from the mixed lot of cream, I would not have won the premium. I got the cream that made that butter from four men that I knew how they took care of their cream." He read the names of those four men right there before that audience and you ought to have seen those fellows look at one another. They all thought their cream had gone into that product, but they found out it came from just four men who were taking the proper kind of care of their cream.

Mr. Glover: There is one factor that we have failed to note, and that is, the effect of poor cream on the quality of butter, and that in turn upon oleomargarine. Many people say they would rather have good oleo than poor butter, and oleo is all right to use if a person wants to use it. When oleo sells as oleo and is served as oleo at hotels and restaurants, I have no objection to it. But as dairymen we ought to guard our market and make a product that will hold the consumer and not let him get into the habit of eating oleomargarine. There are plenty of men willing to state that the present market condition is due in no small degree to the poor quality of butter that has been coming into the market; that the consumer has learned that good oleo is more palatable than poor, rancid butter and he prefers it to an inferior grade of butter. Now, there is no buttermaker on earth who has the knowledge, or the science, or anything else that will enable him to take poor cream and make it into good butter. It is up to the farmer who produces the cream and no one else. You are all interested in having good markets; you should be interested in having the consumer prefer to eat butter, and you should do your part by producing a good quality of cream.

Another factor that has not been emphasized is the value of skimmilk for feeding the young stock on the farm. Ex-

periments have shown that when fed to the pig, three parts skimmilk to one part corn, skimmilk is worth 25 cents per hundred when corn is worth 50 cents a bushel, or, in other words, 100 pounds of skimmilk is worth half as much as a bushel of corn, the feeding value, of course, remains in the same relation, no matter what these products sell for. Skimmilk fed to grade calves is worth 50 cents per hundred when a grade calf six months old sells for $25. Only week before last a man in Fort Atkinson said that he would give $35 apiece for three carloads of grade dairy calves.

A Member: What kind of grade?

Mr. Glover: Any kind of grade dairy calf; he was looking for Jerseys, Guernseys and Holsteins; he didn't ask about Brown Swiss or Ayrshires, but he wanted good grade dairy calves and he wanted three carloads of them. You can raise a calf to six months of age on from 3,000 to 4,000 pounds of skimmilk and $7 or $8 worth of corn and hay.

I am not going into the discussion of calf feeding, but I simply want to cite this to show you what the feeding value of good skimmilk is, when fed to the right kind of an animal. It is well worth considering. Fed to a pure bred, the butterfat becomes the by-product and the skimmilk the real product.

Mr. Scribner: There is always a great temptation, if the old cow should stick her foot into the pail, to keep right on milking. The fact of the matter is, we really need to have a revolution in character pretty nearly all around, we need to be made over, born again, and born right the next time. We are too likely to have seared consciences that are not sensitive enough to tell us what is right or wrong. If we can only get the idea firmly fixed in our minds of doing right, not only with ourselves, but with our neighbors, I believe the time is coming when we will have a good quality of milk made from separator cream.

Mr. Thompson: If it is in order, I would like to ask about the milking machine.

Mr. Michels: I used the milking machine a year on trial; there were good points and poor points.

Mr. Scribner: We didn't find it satisfactory. I know they tell us it is very easy to keep clean, but we found that if we kept it as clean as we wanted to in order to send our cream

sweet to the city, we had to give it a great deal of attention. However, we found the greatest difficulty was with the cows. They like it all right, they lick it as they do a calf, and sometimes they succeed in turning the valve, and then it would drop off the cow's teats onto the floor. We found we had to take great pains and be very watchful, and they cost considerable money too. However, I am hoping something better will come in. I say the cows liked it, but once in a while there would be a cow that wouldn't give down her milk, and we had to strip by hand, and some of our very best cows were nearly ruined in that way; it took them two years to get over it, so we did not consider it a very good investment. We had a gasoline power machine to run it with. It was called the B. L. K. milker.

Mr. Michels: I used the kind that is pumped with the foot. We have twenty-two cows in our barn that we could milk just as nicely and clean with it as we could by hand, but from others we couldn't get any milk. Then again, as one of my men expressed it, there was too much "monkey work" with it, and several said they would rather milk by hand than bother with the machine. My idea about the milking machine is this, that it will take altogether a different teat cup than what they have at the present time; I think the main difficulty is right there.

FEEDING AND CARING FOR THE CALF.

M. L. Welles, Rosendale.

Much has been said in the agricultural press in the past in regard to the feed and care of the dairy cow but comparatively little in regard to the feed and care of the calf.

Now, if the statement, made a few years ago by a professor of animal husbandry in Wisconsin, is correct that any dairy bred heifer calf properly fed and cared for would make a good dairy cow, then this subject must be of vital importance to us, as dairymen. I believe there is a good deal of truth in the statement made by the professor.

We all realize that the calf of to-day is the coming dairy cow and we must do all in our power to develop its dairy qualities in the best possible way. The calf should be fed with great care. We make a practice of letting it suck the cow for its first meal. Then feed milk from a pail, the amount depending on the size of the calf and its inclination to drink. We weigh it for them so we know just what they are getting and we plan to feed with regularity night and morning.

The first three or four weeks we give whole milk, often diluting with hot water, about one-third, to prevent scouring, for whole milk is often too rich for young calves. We then gradually change to skim milk and if the calf has done well at the age of six or seven weeks, we give it all skim milk and continue feeding it until it is at least a year old, that is, if we have plenty of it.

After the calf is six months old if he has grown well, twenty or twenty-five pounds per day is given, seldom more. I think there is such a thing as giving them more than is good for them even though they do crave for it. The milk should be warm when fed. I think calves are often injured when young by feeding cold milk.

Young calves should have second crop clover hay before them as soon as they will eat it. I speak of second crop clover because that is finer and they eat it better than first crop. The mangers should be cleaned at least once a day and a fresh supply given.

They should have plenty of wheat bran or oats before them as soon as they will eat grain. The best time to feed it is right after giving them their milk as they will learn to eat it sooner if given at that time. I like oats best but often times you can get a calf to eat wheat bran sooner than oats. We give oats up to the time they are a year old and often longer. I have it yet to be proven to me that it pays to grind oats for young stock.

Corn silage is highly recommended for calves by many good dairymen after the calves are older. We never have tried it as we are always short of corn silage so prefer to keep it for the cows and give the calves hay for roughage. We never turn calves to pasture now before eight months of age as experience has proven to us that we can make them do better on dry feed up to this time.

is one part salol and two parts sub-nitrate bismuth, well mixed together; give them a heaping teaspoonful every six hours until you see an improvement; then I give the doses perhaps twelve hours apart for a while. I should have said that previous to that dose I give two tablespoonfuls of castor oil to start with and then in about two hours afterward I start with this other preparation, giving it in a little milk.

A Woman: Did you ever try feeding them raw eggs?

Mr. Welles: Yes, but if the calf has really got calf cholera, it is of little value.

A Member: You know when milk is freshly separated, there is a lot of foam on it. Do you give it to them just as it is, or do you let it stand a minute or two and take the froth off?

Mr. Welles: I don't pay much attention to that. If the calf is in good condition, I don't think it will hurt it.

A Member: Did you ever have a calf choke to death?

Mr. Welles: No sir, I never did. I once saw a calf that had not been used to milk for a long time and was very ravenous for it. He drank it very fast which made him bloat. He was simply crazy for it, he stuck his head clear in to his ears.

Mr. Blakely: Have you had any experience with dehorning calves?

Mr. Welles: Yes, I dehorn all my calves with caustic potash. I always do it before the calf is six weeks old, and sometimes even then the butts are very prominent. I usually do it at from two to four weeks old. You want to be careful to trim the hair off very close in a place as big as a nickel around the butt of the horn. Put a little bit of leather around your stick of caustic, so it won't touch your bare hand and rub it on until it begins to look a little bluish. It is not very painful to your calf; it doesn't bother it but a very short time if put on properly.

A Member: Will that stuff lose its strength if you store it away? We had some put away for a few months and we thought it was in an air-tight vessel, but in spite of our precautions, the air worked in and ate a hole through the rubber.

Mr. Welles: If the air gets in at all, it soon weakens it.

The President: Do you pay any attention to disinfecting the navel cord when a calf is born?

Mr. Welles: I have paid considerable attention to that, but in my experience I haven't found that it made one bit of difference in connection with calf cholera; those that I had paid the most attention to were taken sick just as young, often the most valuable calves. They were sick within forty-eight hours after they were born, but they recovered where I used the treatment that I spoke of, with the exception of one. I had one calf that seemed to have paralysis in its hind legs; when thirty-six hours old it was real sick with calf cholera.

A Member: Have you had any calves with breached navel?

Mr. Welles: No, sir.

A Member: I would like to know a remedy. I have three in my barn now.

A Woman: We have had trouble that way. We put a strap around the body of the calf and got it through all right.

Mr. Welles: I believe that the main thing in handling calf cholera is to be prompt with medicine before the calf gets weak. If it once gets weak, it is quite difficult to do anything for it.

Mr. Goodrich: Have you ever had any calves taken with calf cholera before they had anything to eat?

Mr. Welles: I never had.

Mr. Goodrich: I understood you to say you let the calf suck the cow at first. Now, were they rich milking cows?

Mr. Welles: Yes, they were. Some were quite rich and others just normal.

Mr. Goodrich: The ones that had calf cholera, were those that sucked their mothers that gave very rich milk, were they not?

Mr. Welles: Every calf born on my place in the last three months has had it. I have tried disinfecting the stables, done everything, but they get it just the same, and most of them before they are forty-eight hours old. Now, I know how to handle it, of course I don't like it, but don't dread it the way I did. I have thought and thought, trying to find out what could be the reason, but I don't know how to account for it.

Mr. Glover: I understand there are several kinds of scours. One is termed white scours, caused by germs, which get into the calf's body through the navel right after it is born. The treatment is to keep the navel from coming in contact with

the bedding, or any part of the stall. This, as a rule, prevents the disease, for which we know no remedy after it is once started. The navel is disinfected with any good coal tar product, carbolic acid, permanganate of potash, or corrosive sublimate, and then a bandage tied around the calf's body.

Now, as I understand, Mr. Welles' calves are not suffering from that disease; he says he sees no change from protecting the navel, and I believe the cholera which is affecting Mr. Welles' calves is due to the richness of the cow's milk rather than to germs. It is a well known fact that you can so feed a calf as to kill it; milk testing five per cent or higher is too rich for calves. We must remember that the dairy cow is more or less an artificial creation for the average test of milk is below 4 per cent. When we increase it to 5 or 6, we are giving that calf an unnatural food, therefore indigestion sets in and scours follow. I believe if Mr. Welles would modify the milk given to his calves and not permit the calf to suck more than once, that he would reduce his trouble. Of course, it may be something else; no one is able to fathom these things, no matter how much he studies the causes.

Mr. Welles: I have gone into my barn sometimes where a calf had been perfectly right at feeding time, and before twelve hours had elapsed, the calf would be so sick it couldn't stand up. I have used this treatment I spoke of and the calf would come out all right. I tell you this for your encouragement, so if you do find a calf pretty badly off, don't give it up as a hopeless case, but go right at it. I keep this stuff on hand all the time, because I am looking for trouble.

Mr. Blakely: Two years ago I had this same trouble, and I did as Mr. Glover recommended and it helped some, but all the same I find that some cows that bore calves before that died, had healthy calves since that, calves that sucked their dams for about one day, just the same as those that died did. I have taken the calf away before it ever had a chance to get any milk from its mother and the trouble came just the same. It is as Mr. Welles says, before you hardly know it the calf is about ready to die. Another thing, the only calf that died for me this year, had a mother who was not as high a tester as the other cows of the herd.

Mr. Welles: I want to emphasize the point about having the

same man always feed the calves. I want to feed the calves myself if I don't do anything else, when I am at home. There isn't anything about my dairy operations I hate to leave so much as I do the feeding of the young calves when I go away, as I did this morning.

The President: Don't you find, just as soon as you go into the barn, you can detect anything going wrong?

Mr. Welles: Yes sir, and the hired man can't.

DAIRYING AND ITS RELATION TO FERTILITY.

C. P. Goodrich, Fort Atkinson.

Mr. President, Ladies and Gentlemen: My subject is the Relation of Dairying to Fertility, and I am going to talk about fertility considerably and dairying just a little, because fertility is the most important thing on earth. It is the fertility of the soil that keeps the people alive, and the people of the United States have been wasting that fertility in a fearful way.

The population of the United States in the last fifty years has gone up from 31,000,000 to over 92,000,000, has trebled in fifty years and every one of them has got to be fed out of the fertility of the soil. In connection with that we must remember another thing, that the exports of foodstuffs have dropped off,—that is, exports from the United States to foreign countries,—very much of late years, so that it will only be a very few years, maybe not three, before we will not be sending anything out of the country, because the people of this country are going to consume all we can raise.

As I said the population has trebled in fifty years. Suppose it keeps on at that rate,—in another fifty years where are they going to get their food from, and particularly if the people of the United States continue to waste and destroy the fertility of the soil as they have done?

I tell you, my friends, there are young men here to-day who, if they live to be the age that I am—and some of these others are pretty near,—they will see land worth three or four times

what it is worth now. I am just a middle-aged man, you know, and we middle-aged men are looking forward to leaving something for our children, and the older we get the more we think about it; we want to leave things in shape for them, so they will be comfortable and have the means of getting a living. I ask you what better can we do than to leave a farm with a rich soil? Nothing; no better legacy in the world.

Some men go right on robbing the soil of its fertility, raising grain and selling it off and getting money for it, and first thing they know, the fertility of that soil is gone. I tell you we want to take care of the fertility of the soil.

Now, how did this earth become so fertile? Nature has been at work for countless ages, building up the fertility of the soil through the action of the elements, the sun, the frost, the air; these have been disintegrating the rock and making available the mineral elements of fertility; the forest has been shedding its leaves, they have been falling on the ground, been decomposed and made into humus. On the prairies, the roots of the plants go down deep, you know what a tremendous sod there is on the prairies; that has all the time been forming humus, and I want to tell you that humus is the most important element in the soil, not that it has the most plant food in it, but it can hold water, can take up, in the first place, twice as much water as soil without any humus in it, and it holds it and gives it back to the plant, and that is just what we have been wasting,—the humus in our soils.

Why, when we first came here to Wisconsin, out on the prairies and openings down about Rosendale where Mr. Scribner lives, the land was very rich. They raised wheat and then set fire to the strawstacks. I don't know whether he remembers it, he is only a boy even now, but right from his place you could stand on a hill and look out on a September evening and see fire from strawstacks going up all around.

Mr. Scribner: I remember it.

Mr. Goodrich: You are older than I thought you were. But in that way the fertility was lost, and lost each year.

I was struck very much when, a few years ago, I went to the State of New Jersey to talk to the State Board of Agriculture. They sent for this man from way out in Wisconsin.

I was pretty green and thought it was pretty cheeky of me to go down there and talk to those wise men, but I tell you I found that they needed talking to. In that small state of New Jersey, where they had such very rich soil, they had paid out in that one year $3,000,000 for commercial fertilizers and then their crops were poor. I asked them what was the matter. Well, they said it was so dry, everything dried up; the seasons had been dry in late years. I told them the seasons had just as much rain in them as in years before, but they said, "No, our land seems to suffer for want of rain." I said to them, "The humus has gone out of your soil, that is what ails it, it doesn't hold any of the water that falls on it, it dries right up."

Then I went to the state of New York, where I used to live, and found that where the land thirty years ago was rich and fertile, the sidehills were washed down. I asked them, "What is the matter with your land?" "Oh, it washes so it wastes all the rains." Well, then I told them it washed because there wasn't any humus in the soil; the humus was out of it; it didn't take up the water; it ran right off; there were no fibrous roots left to hold it in as there used to be when the country was covered with grass and other plants to hold the water. Then one man said, "Oh, my land is clay ground, and it cracks, and when I plow, it comes up in great chunks. What is the matter with it?" Well, I had to give him the same old answer, "You haven't got any humus in your soil, that is what is the matter."

I also went to Michigan. They don't rob the soil in the same manner over there; still I had to tell them that they hadn't any humus in the soil and then they began to call me "Old Humus," and one man said, "That man has got humus on the brain." Well, if by any outrageous statement I could make an impression so as to make people remember these things, I would feel that I had done a little bit of good in my life.

I tell you the folly of this generation is going to cause suffering in the next generation.

Now, I want to come down a little finer to some actual things I have seen. In 1901, I went to Genesee County in Western New York, the place where I lived sixty-five years

ago, before I came to Wisconsin. There are some old men here now who can remember about the famous Genesee wheat country; that was the most famous country for raising wheat that was known in those days. It was so famous and the wheat was so fine that when they graded wheat, the first quality was called "Genesee" wheat, whether it was raised in Wisconsin or Minnesota, or wherever it was raised. Well, they went right along raising wheat every year, year after year. The crops kept growing a little smaller and finally they went to summer fallowing, so as to raise it only once in two years, and that seemed to make more of the plant food available. But it was an additional damage to the land, because it did not put any humus into it, and left it so it washed all the more.

In 1901 I went back there, and what did I see? I will give you a comparison of two farms that were close to each other right near where I lived when I was a boy. I will call one farm No. 1, that was where the man used to raise wheat and raised wheat right along—he was a pretty sensible man, too. I remember hearing him say when I wasn't more than twelve years old, "I know this isn't just the right way to do, it is going to take the fertility all out of my soil, but I guess it will last as long as I live, and after that I won't care anything about it. I am not worrying about posterity, my posterity never did anything for me anyway." But I tell you it didn't last even long enough for him, and he didn't leave anything for his boys, because the land wasn't good for anything by the time he got through with it. And when I was there in 1901, I went all over that farm where I used to work; I knew every hollow and every hill. I could pick out the places where I piled up stone when I was a boy, and I could almost feel my back ache just as it used to do. I inquired if that farm was for sale, and they told me it was. I asked what it could be bought for. "Fifteen dollars an acre," was the reply. It was once some of the grandest wheat land that ever laid out doors, but it had come down and wasn't worth anything; why, it was all washed and gullied and the only part of it that was good for anything was the swamp.

Then I went to another farm close by, I will call that farm No. 2, just the same kind of land. When I got there, every-

thing looked fine and everything was fine. The side hills were not washed. The farmer was still raising some wheat, and I saw a magnificent crop of winter wheat on top of one of the hills, just as fine as could be.

Now, what made the difference between those two farms? The owner of farm No. 2 way back long years ago conceived the idea of going into the dairy business—you see I am geting around to where I am going to talk a little about dairying. This man kept a herd of purebred cows and the name of that firm was M. C. Reed & Sons. They kept a lot of dairy stock, all they could keep on the place. Mr. Reed was an old playmate of mine and I asked him, "What is your farm worth?" He says, "Perry, I am offered $150 an acre for it." And the farm just across the road you could have bought for $15 an acre, and then got cheated. This farm was easily worth $150 an acre. And it was because he had kept all the cows that he could carry on it and kept the soil full of humus. The side hills were only plowed up once in two or three years and before the humus and the fibrous roots all got out of it so it would wash, it was seeded down again. I tell you that was a great eye-opener to me, the comparison between those two farms.

Now, we will come down right here, to Wisconsin. When I was a boy, in 1846, I settled in Jefferson County. Now, the southern part of Jefferson County is not the best land in Wisconsin. I don't want to run down my own county, but just the same, it was not the best land, especially the southwestern part of the county; about Fort Atkinson and below there it was not naturally the best land in the world, and we wanted to raise wheat. We farmers wanted to get out of the land something that we could sell. West of us in Dane County was the Koshkonong prairie, a great deal richer land. They raised wheat over there, but pretty soon even that fine soil began to give out. We had to do something else, or starve; we had to go to keeping cows, and there is where dairying first started in Wisconsin, down around Fort Atkinson. We went to keeping cows, and all the feed we raised on the farm was fed to the cows, and some things were bought besides. Our land commenced to go up and up in production, until pretty soon it produced more per acre than the rich Koshkonong prairie land. When I came to investigate, I found that those fellows in Dane

county, that is most of them, had their farms mortgaged, while our folks running dairy farms, had gotten their mortgages all paid off.

I commenced dairying a long time ago. I bought some land that had not been cultivated a great many years, so it didn't have a chance to get so very poor, still it had deteriorated some. But I went to dairying and my land grew better and better, and then about twenty-five or twenty-eight years ago, somewhere along there, I bought another farm, a little distance from mine, a mile and a half or so; that consisted of the best land in that part of the country. Sixty years ago I helped harvest some of the finest crops that ever grew out of the ground, but for thirty-five or forty years that land was cropped to wheat and other grain and never one bit of clover raised on it; no manure hauled on it, only a small patch of it manured from a cow or two. I bought that land very cheap, of course, but every little depression in the ground would hold water and get hard. I seeded it to clover, the first clover that it had ever known, and it so happened that it was a good season and I got a good catch. I put on all the dairy cows it would carry, and bought some feed besides, and it was only just a few years until on top of every acre I had another acre; it produced so much more. I had not only put back the fertility which had been lost, but I brought fertility from Minnesota and Dakota in the shape of bran and oil meal, that they were anxious to sell, and I fed it to my cows and spread the fertility on my land. I raised clover and plowed it under and did the very best I could to get some humus into the soil. As I told you, I had one acre on top of another, until it was three deep. That land today will sell for four times what I paid for it and it is worth more than that.

Mr. Scribner: Did you pay a dollar an acre for it?

Mr. Goodrich: I paid $25 an acre for it, and now it is worth $100. It is true that land laid level enough so it didn't wash, so I hadn't that trouble.

I find I have a little something else on my mind yet and I guess I will have to relieve it.

I have been talking as though you and I and all of us owned what we call our land, but I want to tell you that is fiction. We don't own any land. There isn't a man here that owns an acre of land, you can't prove to me that he does. This is God's earth,

and you have just the privilege of staying on a little piece of it for the little while you live. That is all there is to it; you have got that sacred trust. It is your duty to turn that land over to the next generation in just as good condition as you took it—or better, and if you don't do it, you are a thief and a robber. You have no right to rob the next generation of subsistence. I tell you I think just as much of the man who would go on a dark night into a bank and rob it, as I do of a man who would rob his children and his grandchildren and their children after them of subsistence.

Wisconsin has done better than other states in this matter, because we have been in the dairy business and have kept up the fertility of the soil.

Now, I want to say to you dairymen, go on with this good work; keep up the ferility of the soil, as well as you can; leave a rich and valuable legacy to the children who come after you; be good dairymen; keep up your soil and then you may inherit the Kingdom of Heaven.

DISCUSSION.

Mr. Scribner: It has been my privilege to try to build up one of these worn-out farms. Our farm was treated as Mr. Goodrich has said, for years and years, until I could raise nothing but chinch bugs and cockles and wire grass and one thing and another, so we were driven to another style of farming. We started perhaps one of the first experiments in rotation and the keeping of dairy cattle, consequently our dairy farm has been getting richer and richer, until today it is almost impossible to raise small grain. Last year I thought I would try to find something to stiffen up the straw so it would stand up; I wanted to get a clover catch. I visited some of these commercial fertilizer chaps and they said the thing they were selling would stiffen up straw. So I told them to send enough to cover one-half of the field to which I applied two hundred pounds of commercial fertilizer to each acre. On the other half of the field I put no commercial fertilizer and the result was that on the side I did not use it, we had about thirteen bushels more than we had on

the part it was put on. It showed me that we do not need much more than clover and good cow manure for building up our land. If we will just take care of those two things, keep our farm in rotation and carry plenty of good dairy stock and grow the right kind of feed for our dairy stock, we will get our farms in just as good condition as we need.

Mr. Thompson: I want to ask Mr. Goodrich if in place of raising clover we could raise alfalfa. Will it be as good for the soil?

Mr. Goodrich: Better. It reaches deeper into the soil; there is greater root growth to it and it will produce more humus and brings up more fertility from way down deep and deposits it right at the crown of the root. Yes, I am satisfied that alfalfa is better than clover.

Mr. Thompson: I have got a swamp or marsh that has in it any amount of what I would call humus—but maybe it isn't. Now, what I want to know is, would it pay to haul this stuff from the marsh up onto the high ground and spread it the same as you would manure? This stuff has been gathering there, you know, from grass and vegetation that has been growing and rotting down again for thousands of years perhaps, or more; it is three feet thick.

Mr. Goodrich: There is probably plenty of fertility, but there is apt to be a good deal of acid in it. In time it will help the land, but it won't right away; that is, if it is such land as I think it probably is. There is some muck that will help the land right along, but I have tried hauling it out of a peat marsh, and it didn't seem to do much good at first, and I concluded it was acid. It probably wanted some lime.

Mr. Thompson: I live close to a lime quarry. They are crushing limestone and producing lime; it is what is left from partly burnt wood and partly broken limestone. It is hauled out as worthless, and I have been thinking of getting some of it to spread over this marsh. Of course there is a pile of ashes there and I don't know how that would be.

Mr. Goodrich: Your best plan is to experiment with it, then you will know more about it than I do. I would try it anyway.

Mr. Glover: Mr. Goodrich's advice is very safe to follow, but I might say that Dr. Hopkins of the Illinois Experiment Station has made a complete soil survey of Illinois and has had

a great deal to do with peaty soils, as they have much marsh soil in Illinois, lacking potash, and by the addition of potash he has increased the productiveness of such soils from, say, six to ten bushels of corn per acre up to sixty or seventy, simply by the addition of potash. These ashes you speak of are rich in the element of potash and I should say that on this peaty soil, it would work all right. Now, a word about lime; where there is an abundance of humus or organic matter, you may add some quick lime to the soil without injury, but under ordinary conditions, it is not considered a good practice to apply it, because it burns up, destroys, the humus. Sometimes a stubborn soil will handle this quick lime to advantage and you will get a good crop, but you will reduce the fertility. The Pennsylvania Experiment Station has experimented for twenty years and it was found that for agricultural purposes ground limestone is far better to use than quick lime. In the older agricultural localities where acid is excessive, it has become necessary to use lime, because the bacteria which are necessary will not grow on alfalfa and clover in acid soil.

Prizes were awarded before adjourning.

Much interest and amusement was occasioned during the distribution of prizes offered by local merchants.

Adjourned to 7:30 P. M.

The Convention met at 7:30 P. M., same day.

The President in the Chair.

Music, Neenah High School Choral Club.

WHAT EDUCATION SHOULD DO FOR THE DAIRY FARMER.

C. P. Cary, State Superintendent of Schools,

Mr. President, Members of the Dairymen's Association, Ladies and Gentlemen:—I am honored to have been invited to speak before your Association, though there are some topics I am more familiar with than the dairy business.

One of the most important things that anybody can consider

in early life particularly, is the question of a line of occupation. There are very great differences in occupations in respect to the matter of their leading one onward and upward, in the matter of education, and in the matter of development of spirit and in the things that go to make life worth while. There are some occupations that seem almost inevitably to draw one down, to lower his standards and to make him less of a man as time goes on, while there are other occupations that seem almost inevitably to draw men upward, that have an upward tendency constantly, so that a man is absolutely derelict in his duty, if in certain occupations in life he does not grow and develop in the right direction.

I want to speak for a moment of the wonderful story of Denmark, with the thought of the effect upon a man being engaged in the dairy business. Those of you in the dairy business know that at one time that country came to a point where it was extremely difficult to earn a living upon the cold, bleak and poor soil, and after probably considering what line of work would be most likely to help their particular conditions, they embarked in dairying, and it was not long before they found they had made no mistake with the dairy business and keeping swine and chickens. These three things have gone along hand in hand in Denmark and the financial conditions of that country have very substantially improved. I have seen the reports of several students who have gone to Denmark to study that wonderful country and invariably they say that those engaged in the dairy business are intelligent men. They are the men who are steadily improving and who are ready to co-operate in all things for the good of the country. In Denmark, where this occupation has been followed for a good many years, we have a fair example of what dairy business will do for those who are engaged in it, and so, remembering also the kind of men who are engaged in the business in this country, I believe I am safe in saying that the dairy business is one of the occupations that has in it an upward tendency, a tendency to develop intelligence, co-operation, many-sidedness. I know of no other business in which it is so imperative that a man should be a student of his business. In this country, we have had an abundance of everything, abundance of land, abundance of timber, abundance of all the natural resources, and we have not cared a great deal how we used those

resources. All over this country can be seen the effects of the wholesale robbing of the soil.

Now, the dairy farmer is called upon, for one thing, to study his soil; he must learn how to preserve its fertility; he must learn how to rotate crops; he must learn which are the most profitable crops for him to produce as a dairy farmer.

I have spent considerable time in Kansas and Nebraska and have been much impressed with what they are doing with alfalfa in those states. I mention this because I do not believe that alfalfa has had its just deserts in this state; I believe the day will come when alfaffa will be a source of large revenue to this state. That is another of the problems the dairy farmer will have to study out. A man may go along a good many years, just scraping a poor living out of his farm, and then suddenly find that by a turn of the hand he can develop a gold mine on his farm. You remember the story of the Rockyford melons, they brought fortunes to men who found they could raise them upon land they thought was practically useless. These farmers in Denmark have found that by close application to business, by looking after the by-products and looking after the details, they were able to make money gradually, not in any large quantity from any one thing, but in the aggregate doing very well.

Now, the dairy farmer not only has to study his soil, but he has to study the problem of the animal that he is making his main profit out of, and any man who carefully studies the breeding and the care of an animal of such a delicate nature and physical structure as a milch cow will certainly be developed in intelligence. In these and many other ways that I might name, the dairy farmer has special opportunities for intellectual stimulus.

If his cows are producing, say, $50 apiece, it is a most interesting problem to him to study out the cost of her keep and to try to bring her up where she will produce him $5.00 a head more, and when he does that, this is $5.00 net. If he can make it $10 a head more, that is $10 a head net, everything beyond a certain amount is practically net money and every dollar of that goes to his bank account.

I am going to talk to you just a little while about the education of the dairyman that is to be in the course of a few years.

The education of the coming dairyman is a result of two or three things, and the first of those factors is the home itself. I believe that the farm is by far the best place to bring up children and for several reasons—the main reason is, of course, that a child who grows up on the farms learns to work, while the child who grows up in the city, in all probability does not. He has the stimulus of feeling that there is something he must do, he learns the lessons of responsibility and industry, and those are things that go to make up the backbone of manly and womanly character. Of course this is true of the girls also. Those who go along until they are fifteen or sixteen years of age without learning that important lesson, will in all probability never amount to much as workers. That sounds like a pretty strong statement, but I believe there is a great deal of truth in it.

The farm boy and the farm girl have not had in the past, it seems to me, sufficient stimulus on the intellectual side and very often on the social side. I know in some neighborhoods this last point does not seem to apply. A farmer friend said to me not long ago, "I wish you would tell me what to do with my children; in our community they have got into the habit of giving a party every night somewhere, and they are simply good for nothing during the day." Of course I told him that I didn't know what he could do, but I said to him, "You older people of the community ought to put your heads together, co-operate in putting down this intemperance in relation to social affairs; none of you can do it alone. But you want to be sure to see that your children on the farm get enough social life so that they may have sufficient stimulus in that direction, or they will be likely to take it in some other direction that may not be so good for them." Let the dairymen learn to bring into their homes plenty of papers and books, periodicals and magazines and get the young folks interested in reading them; make the home intellectually attractive, and give them the social stimulus they must have, and give it to them under the right conditions.

Nothing can have more effect upon a child, however, than a splendid example. If a boy has a father who is keeping his dairy clean, producing clean milk, working along intelligent lines for the welfare and health of his cattle and the improve-

ment of his farm and his farm buildings, that is a splendid training for his children, they never forget those lessons; on the other hand, it is most unfortunate for a child to be brought up on a farm where things are done in a slovenly, careless, haphazard way.

I am far from satisfied with the country school and I wish that that dissatisfaction would strike hard into our country people. The country school is not keeping pace with our city schools, and I fear the trouble is that the farmers do not realize that the times are changing, that a dollar does not go as far to-day as it did twenty, thirty or forty years ago. In those days the country school teacher got about $40 a month, and many a farmer to-day thinks that $40 a month is enough to pay for that service, and the result is that while the teachers in our country schools are conscientious and doing the best they are able to, still too many of them are inexperienced and incompetent. Too many people think that a child goes to school to learn a little bit of arithmetic, a little bit of spelling, a little bit of grammar, and so on, but that is a minor part of the matter; the child goes to school first of all to have his intelligence developed, to come in contact with an experienced, trained mind. A teacher ought to be a person of superior mind, a person who can stimulate thought, who can guide, and as a rule a young man or woman of eighteen, nineteen, or twenty, is not competent to give the kind of help and stimulus that is wanted. The farmers will go into town and get a girl to teach their school who has never been on a farm in her life. I look back forty years and realize the great influence on my life of a teacher in our country school. He stimulated my thought, he set me working on large problems, and I feel that I am more indebted to him than any other one influence outside of my parents. His personality had a marked influence on every child in that school, an influence for good which has never faded. The question of the training of your children is one of the most important duties of your lives. When you come to wind up your lives, I don't know of anything you could possibly have done better than to have brought up a family that was an honor to you and to the community in which you live, and I know of nothing that will raise people higher in the respect of their

neighbors than to have brought up a family so that they have become pillars of society, strong in the community.

It is important to remember that in our homes the children are taking their lessons from what we do, from the way we conduct the home, from the way we conduct our business, and then when we send them to school, we need to bear in mind that it is not simply the matter of their acquiring reading, writing and spelling, but it is a matter of the development of their moral natures, the development of strong manhood and womanhood such as will be of distinct value to society. I thank you.

Music, Choral Club.

Dairying in Europe, with Illustrations.—Professor E. H. Farrington.

Adjourned to 10 o'clock A. M., Thursday, February 9.

The Convention met at 10 o'clock A. M., Thursday, February 9.

The President in the chair.

Prayer by Rev. Mr. Martin.

VALUE OF COW TESTING ASSOCIATIONS.

W. H. Clark, Rice Lake, Wis.

The value of cow testing associations is incalculable. I never dreamed there was such a field of work and such need of work as there is today, until I had some experience in it.

What would happen if every dairyman and cow owner in Wisconsin would test his cows? Do you think that the average production of Wisconsin cows would hang around 150 pounds of butter fat? I don't know what would happen but I believe that if this should really be done, that the average would raise nearly 100 pounds per cow in one year's time, for the reason that most of the real poor cows would go out, and there are hundreds of real good cows that would make 300 pounds or more of fat a year if their owners only knew that they were worth feeding, but as they

don't know the capability of their cows, they are handled carelessly with little or no profit.

As it appears to me, more advancement in the dairy industry can be made through testing associations than any other way at the present time. Testing will weed out poor cows and find good ones, thus giving the farmer a knowledge of the material he has on hand for the foundation of his future herd. There is no way that a farmer can see so quickly the value of good feeding and good care as through the association test.

Many farmers are prone to rely too much on breed. Testing shows that it is the individual that counts and year testing is the only way of knowing the individual. For example, I will cite you to a modest cow that in a yearly test, her highest production of fat for a month was only 41 pounds, her highest month production of milk, 848 pounds. Now, if we were to stop here, she wouldn't amount to much, but here is where yearly tests count. She gave in a year 9,308 pounds of milk, 430.5 pounds of fat. The first twelve days of her year she made 13 pounds of fat, the last twelve days she made 9.6 pounds of fat, and the very last day of her year's test she gave 15.9 pounds milk and .9 pound of butter. We would have been very likely to underrate this cow without a long test.

Local testing associations are the most practical of all tests and the cheapest of any successful method. Testing encourages good feeding, good care, and good breeding, it also teaches the feeding of balanced rations and advances the interests of breeders. Records made under the supervision of the State Dairymen's Association have more weight with the buyer than private records and are also a great help to the seller.

We organized a testing association at Rice Lake nearly two years ago and it has proved a success. Quite a number of our farmers had realized the necessity of testing their cows, and several had purchased hand testers. Others nearby had formed an association on the fifty cent plan which proved unsatisfactory. We organized with a few over 300 cows and more were added during the year.

Here I wish to tell you of one member of our association. He had delivered milk in the city for some years, had become

very slack in keeping his cows and had quit the business, letting his cows grub in brush during the summer and at a marsh hay stack in the winter when he had one. One thing I saw him do. He would go to town and get coarse manure as it was thrown from the horse barns and throw it on the snow covered field near the barn for his cows to eat. This was about all they had to eat during the latter part of the winter.

In the spring some of his cows would have to be "tailed up." In the summer they would give some milk and get in condition so most of them would pull through another winter.

When we were getting our members we talked with this man. He seemed interested and said he would talk it over with his wife and let us know what he would do. He didn't show up so in a few days I stopped to see the wife and laid the advantages of a testing association before her. She said, "Mr. Clark, for the ten years we were in the milk business I saw that the cows were watered twice each day, and the barn cleaned, and usually did it myself as the children were all small, but I got sick of it; if I thought it would do the boys a bit of good I'd try it. The boys are following right in his footsteps and I will try it."

The result was before the association had been going three months this man told me that he wouldn't take his name off the list for twenty-five dollars.

He became interested from the start and began feeding some grain as his cows freshened in the spring. Some of them responded well, others he sold and bought good common stock. He took pains in putting up his crop, bought mill stuff and grain and pea silage from the canning factory and when the year closed he was well up with the good ones of the association.

Last year when so many were selling their cows on account of the severe drought, he was securing feed. He ordered a large amount of pea silage and bought a cow occasionally when it was known that she was a good one and he is now making plans for a silo this year.

A few members dropped out of the association at the close of the first year, and the balance was anxious to enter another year's work and this year we joined the Barron association, covering a much larger territory. This method has

its advantages as it spreads the influence among a larger number of farmers.

From the Barron part of our association comes another incident that perhaps would interest you. Last summer we were fortunate in securing one of the Hoard's Dairyman prizes. Of course it was published in our local papers and along in the fall comes a cow from the Barron end of our association that exceeded the actual fat production of Miss Narcisse, and laid claim to the champion cow of the county, and as the tester was taking our next test a "phone" message came that another member wanted him to make out a balanced ration for his "crack" cow. He wanted to do the whole bunch.

Now this rivalry has its effect. In their effort to excel, they feed better; the cow does better, and in the footing up of accounts they have made more money, so what started out as a matter of rivalry really turned out to be a paying proposition.

Some say—Why can't we do our own testing and save that dollar? You can possibly, but very few will. Several asked that question when we were organizing and they would not join, and of the number I think I am safe in saying that not one has anything like a complete year's record of his herd and none the advantages of the association. As for myself I have owned a Babcock tester for eighteen years and never got a complete year's record of each cow until we established a testing association. And it was through the local testing association that I worked up courage to enter the state contest with the entire herd.

There are three essential things in successful dairying: good breeding, care and feeding. It seems to me that we are behind in the last two essentials. We have better breeders than we have caretakers and feeders.

When there is a good feeder in an association, some of his neighbors will wonder how he gets so much more from his cows than they do. If they investigate they will find there are two kinds of "economical" feeders. One kind feeds just as little of just as cheap stuff as is possible to get. The other feeds all of the right kind of feed he can get his cows to eat with a relish. The balance sheet shows which is the practical feeder; it shows the poor feeder just where he stands and

the good feeder just what each kind of feed costs him, and teaches him also how to feed the individual cow, and teaches us all that it pays to breed better, pays to feed better and pays to take better care of our cows.

Friend dairymen, let us take a stand for better work in dairying. This can be brought about in no better way than through the testing association. Let every one of us take it upon ourselves to encourage this work. So many farmers are so ignorant of the principles of good feeding, and it seems they never can be taught until some practical example is set before them or they get into the work.

It takes considerable grit to pay good hard money and especially so if one lacks the cash to buy feed for cows unless one is absolutely sure it will pay to do it. A financier would say, "If I can get fair profits on an investment I will borrow money." Now if we farmers could invest money in some scheme in the Philippines or north pole that would pay two hundred or three hundred per cent on the investment, we would fall over each other to get the money first. Yet this same thing was done last year in our testing association. There were several cases where members could have borrowed money for all the feed the cows ate, including pasture, and at the end of the year could have paid back the principal and have left from one to two dollars for every dollar invested in feed.

Now friends, how are we going to know this unless we get our business on a business basis?

The testing association is the way to do it.

DISCUSSION.

Mr. Goodrich: Don't you think it would be a good policy for everybody to keep right on testing every year? We all know that new cows are coming into a herd and old ones going out, and besides that, a cow does not do the same every year, or even right along in one year.

Mr. Clark: I think it would be a splendid thing, particularly because it makes the man a better feeder, it even makes a better feeder of a good feeder, because he takes more in-

terest in his work when he has a living example before him every day and a correct record of what each cow is doing. What I am particularly interested in, however, is to encourage people who have not tested heretofore, to organize an association in their neighborhood, and if they once get in there, I believe they will not drop out. Some will fall behind, of course, but the majority will be encouraged to go ahead and others will be coming in all the time, so that I believe in most communities an association once started is going to live.

Mr. Goodrich: What we want is to show, if possible, the benefits of working together. It is true that a man can do it himself, if he will. For fifteen years I weighed the milk of every cow every milking, and tested it, and in that way I trebled the average product of my cows, by rejecting the poorer ones and feeding the good ones better.

Mr. Michels: Why did those few you spoke of drop out of the association before the end of the year?

Mr. Clark: I can't tell you why. There are some people keeping cows who ought not to, and I presume there were some who were almost ashamed of the records; others changed business or sold their farms.

Mr. Goodrich: That is a point I was trying to get at; some say that if a certain number of people are not satisfied, it may keep others from joining, but I don't think that is good logic. The first testing association was organized in Fond du Lac. Mr. Searles started it and got in quite a few cows. At the end of the third month he heard from one man, who said, "You needn't come to my place any more." Mr. Searles asked him why, and he said, "If you keep on testing and it shows up as it has so far, I will sell every cow I own before the end of the year." Mr. Searles said, "If you were a hotel man and found out at the end of the year that you had a lot of boarders who didn't pay their keep, wouldn't you be better off to get rid of them?" But no, this man couldn't see it; he simply dropped out of the association.

Mr. Clark: There is one thing about this test that a good many of the farmers appreciate. Here is a man who comes to the farms regularly; he is supposed to be a competent man to figure out rations, as many farmers do not know the feeding value of different feeds. He fixes up a balanced ration to

fit the condition of your cows, if you ask him to. He can't sit down in one certain place and figure out a balanced ration for all the cows in the neighborhood, because, as we all know, there is a great difference in individual cows, in their breeding and in their conditions. This man can figure these things out for you; you can try the ration for a month and see how it works and whether his figuring amounts to anything. If you find the ration isn't doing what it ought to do, you can talk it over with him and have it changed until you get one on which your cows will do better. I think you will find that in many cases the ration he suggests will be cheaper than you are feeding.

Mr. Michels: I have heard another objection made on the part of the farmers, and that is the test made but once a month does not gibe with the tests they are getting from the creamery or the cheese factory, and that will be true of course if you take the test of one day's milking, as it will not gibe with the total pounds of milk delivered at the creamery or cheese factory during that month. I have taken that matter up and made tests, say, three and four times a month, and even then there was a good deal of difference, but if the farmer will keep a careful account of the daily weight I think he will find the average test is near enough for all practical purposes.

The President: We have a test association, and I notice that when the tester goes around to the different places, the farmers ask him a good many questions about their neighbors. For instance, "What is Mr. So—and—So's test? What does he feed? What is he getting?" It shows they are watching each other, getting points from each other. Last year we had the Dairymen's Association Convention at our place. A cow census was taken, similar to the one taken here, and we discovered that those who were in the test association were universally getting much larger returns on the average than those who were not members. Of course we must not forget that it is always the more progressive dairymen who go into the test association; it sets them to thinking along new lines. With us, when the tester came round, if a farmer wanted his cream tested, the tester did that also, so that he had a test of his cream outside of the creamery which he could compare

with the creamery test, thus making a check on the creamery, as well as the other advantages.

A Member: How does a test association get a man to do that work?

Mr. Clark: Generally through this Dairymen's Association. It is rather difficult to find good men for that work.

Mr. Searles: The State Dairymen's Association aids the people who feel they would like to start an association. We hold a meeting and in some cases we furnish a full equipment for doing the work and hire a man. We try to get the right kind of man of course to do the work and he is paid one dollar per cow a year, but it is necessary to have at least four hundred cows in order to get that work done. The man who does this work must not only thoroughly understand this matter of testing with the Babcock tester, but he must have some knowledge of feeds. The testers are generally men who have been educated at an agricultural college.

A Member: Do the patrons have to board the tester?

Mr. Searles: Each patron boards the tester twenty-four hours. He comes in the afternoon, weighs up the milk and looks after the feeding, tests, stays all night and next day goes on to another place. The State Dairymen's Association furnishes the record books, so that the only cost to the farmer is one dollar per cow which maintains the association work.

Mr. Scribner: I find in my travels around the country that a great deal of the success of the testing association depends on the tester. If he simply works for that $1.00 per cow and that alone, he is generally a failure. If he enters into the spirit of the business, takes an interest in his work so that he will point out different things as to individual cows, their feed, care, etc., he is much more likely to make a success. It is very essential to get the right kind of a man to do this work.

Mr. Glover: I want to add a word in answer to the question as to why farmers drop out of these associations. As secretary of the Dairymen's Association, a great many reasons have come to me. There is one reason that has not been mentioned here. We have had in our association men owning pure bred cows who have dropped out and when asked why they did, said they didn't want to know the records of their animals,

so that when people came to their farms to buy a pure bred bull and asked what the dam had done, they wouldn't be able to answer. If they belong to the testing association, these would-be purchasers would very naturally say, "You ought to have her record," so when a man had a poor pure bred animal, it was a disadvantage to have a public record of his herd. If he were able to say that she had a great pedigree and mentioned nothing about performance he might sell that animal for $150, or perhaps $200 to a farmer who didn't know the value of records; while, if he did and knew she had a yearly record of only 150 or 200 pounds of fat, and the purchaser learned about it, he wouldn't buy.

When you go out to purchase a pure bred animal to head your herd, you should insist on some sort of a record, showing the production of the cows of the herd.

Moreover, we have found men in the association who have attempted to put the milk of two cows in one pail, with the intention of having it weighed and tested as the milk from one cow. Think of a man paying a dollar per cow per year to have his cows tested and then trying to cheat himself that way. There was a case only last month, where we had to drop a man from an association because he did just that thing, and he is indignant to-day because he was dropped; he wanted the stamp of the Wisconsin Dairymen's Association upon his fictitious records.

Another man tried to substitute one cow for another—by the way, we have to sketch the cows on a piece of paper, to prevent substituting one cow for another. We had to drop that man.

Another man who was in the association awhile came in and said, "I guess I will quit." "Why?" "Oh," he said, "when I get underneath a cow and begin to milk I can tell mighty near what she is giving, and if I can look at the color, I can tell very near what it tests." I said, "If you can do that, you have found out something new. I suppose you have heard that the buffalo gives milk that tests between seven and eight per cent, and yet it is almost as blue as the grass that it eats." He said, "No, I don't know that." "Do you know that the Guernsey cow gives such yellow milk that when the milk is skimmed, it is yellower than the whole milk of some

other dairy breeds?'' No, he didn't know that either. It isn't safe to depend on the old methods in these matters.

Mr. Michels: What do you consider the best balanced ration as an average for your herd?

Mr. Clark: I am not feeding quite one to six. After considerable experimenting, we have struck the ratio of one to 5.8. But now all the cows won't do well on that ration, we have to vary with different cows. We must look after the cows pretty closely to know how to feed them and keep close track of our balance sheet.

Mr. Scribner: I heartily agree with Mr. Clark in regard to this point; what would be a balanced ration for one cow, would not be for another. The feeder must be a very watchful man. He can't throw in a lot of feed and then leave the cow; he must be very observing. I often say a man wants to watch three sides of an animal, or three ends; there is the front end, the back end and the middle end, and a real feeder can't afford to neglect any one of these.

Mr. Everett: I feel that if I don't get up and say something, my friend Goodrich will, and Gov. Hoard and Gen. Burchard and some of the other old members of this Association used to say that if Goodrich could keep still, we would have a good dairy convention, but the fact of the matter is it is pretty hard work to keep either of us quiet in a meeting of this kind. I am always keenly alive and interested in anything that tends to better thinking and more intelligent efforts on the part of the dairy farmer and the discussion we have had this morning on testing cows and more intelligent dairying, has brought more thoughts to my mind than I could express in an hour. I get a good many letters every day from Wisconsin dairy farmers, and you would laugh if you could read some of them, and yet I am sure you would feel sorry at the dense ignorance displayed by men in this state who are keeping dairy cows. For example, I received a letter last week from a dairy farmer, asking the foolish, childish, ignorant question, ''does a cow always chew the same cud, or does she spit it out and chew a new one?'' It hardly seems possible we would have any dairy farmers in Wisconsin so densely ignorant as to ask such a question as that. I often meet dairy farmers who say to me, ''I know just as much about feeding

cows as that fellow who was conducting the Test Association." But he doesn't. Many of you don't know nearly as much about feeding cows as Mr. Searles or Mr. Scribner, or any other man who has made a life study of that kind of work, and it is the narrowness of a man which prompts him to make such an assertion. You might just as reasonably say you know as much about shorthand as Mrs. Kelly, who has been at it over thirty years, to my knowledge, but not one of you knows anything about it, and there is no reason why you should; she has made it her business; she knows how to do it; you haven't and you don't know how.

My friend over here wears a little instrument on his ear so he can hear better. He didn't invent that instrument, a very delicate, effective affair; there isn't one of you who can make one like it; no one is capable of inventing it without years of hard study and that is true of everything we do; everything is a science and a study and a matter of education, and that is true of dairying above all other professions. I hear so much about non-intelligent work, thoughtless plodding among farmers that I get discouraged sometimes and feel almost as though we were not progressing a bit, and yet when I look back, as I have been doing this morning, I must come to the conclusion that we are progressing all the time. It was seventeen years ago this month that the annual dairy convention of this association was held at Neenah in this very room. Gov. Hoard was president at that time. I was elected president at this meeting, being nominated by Uncle Charlie Beach of Whitewater, who has been dead for a number of years. Present at that convention were former Dairy and Food Commissioner, H. C. Thom, H. C. Adams and a lot of other fellows that you don't know who are dead and gone, but who were intelligent dairy workers, every one of them. At that meeting, Aderhold was there, too, a tall, slim, whey-fed cheesemaker. We were just beginning to learn something in those days about dairying, about the better feeding of cows, the better making of cheese and butter; we were wrestling with the problem of filled cheese, oleomargarine and all those things. So now, when I get discouraged because of these many questions that are asked me I think back to seventeen years ago and how little we knew then about dairying and

how much more we know to-day. We are becoming more intelligent in the feeding of dairy cows.

Now, feeding a dairy cow is nothing but a straight business proposition, and I was much pleased to hear my friend Clark's paper. It was brief, but it was full of good meat, good thought, and he is but one of a lot of good dairymen up around Rice Lake and Barron County, who are proving themselves to be intelligent feeders and intelligent breeders, who are proving to the rest of the state that they are making great progress in that vicinity.

But as I was saying, dairying is nothing but a business proposition. You farmers are raising feed upon your farms and paying taxes upon your farms; many of you are buying feed for your cows, either from others or from your own farm, and I suspect that a good many of you do not know what kind of cows you are selling that feed to. Feed costs money, whether you raise it or buy it; it is worth money right here in the markets of Neenah; your barley, corn, oats and clover hay that you are feeding your cow have a cash value in any market today. Now, the great question is, what are you getting for it from your cows? Mr. Clark tells us of some of his neighbors in that test association received as high as $3.00 for one dollar's worth of feed. Do you know what you are getting right now?

I have watched carefully the work of these test associations and the cow censuses that have been taken in different parts of this state, and I have discovered this fact more than once, I am sorry to say, that some of our dairymen are feeding a dollar's worth of feed to a cow and only getting a return of ninety cents in cash for that dollar's worth of feed; while in the very same vicinity, their neighbors are getting $2.00 and $2.50 for their dollar's worth of feed. You can see how foolish, how unbusinesslike it is, for you or any man to give a lot of good feed to cows and not know what you are getting for it, while, on the other hand, it is so simple for you to find out what each cow is worth as a money maker. It is part of your business.

I have been actively engaged all my life in farming—until lately. I am trying to publish an agricultural paper to help the farmers, and as farming has been my vocation most of my life, I have found out that we, as farmers, are clamoring for

somebody to help us in some other direction than in our own profession. I was at Madison a few days recently and spent considerable time in the legislature, listening to arguments pro and con on the subjects of the Income Tax, Employers' Liability, Industrial Insurance, etc., and it seemed to me there were a lot of men there trying to do something they hardly knew what and yet they are there, most of them representing the farmers; the farmers are their constituents. I agree that we as farmers have always paid more than our just proportion of the taxes, because all that we own is visible to the naked eye; every old spavined horse, every old broken-down wagon we have is sure to be taxed, while the fellow who has a lot of bonds gets out of paying taxes on them. I fancy the farmers are interested to some extent also in this question of Employers' Liability or Industrial Insurance. I am told that petitions have been sent to the legislature asking for legislation whereby the farmer will be made absolutely liable for any accident that happens to his hired man or his hired girl, it makes no difference how careless they are themselves.

As I sat there listening, I wondered if those fellows who were asking for this legislation, knew anything about the kind of dairy cows they had on their own farms and how much they were getting for the feed they put into those cows. It seemed to me if we had fewer laws and what we have could be better executed, and our legislators could be intelligent men of affairs of moment to the state more generally, we would be better off.

I want to plead with you dairy farmers about Neenah who have not yet made up your minds to carefully consider this problem of cow testing. I wish you to realize that it will help you directly to find out what kind of cows you are putting expensive feed into, and how much money you are getting back for that feed. It is a simple business proposition, and one that you ought to consider carefully.

REPORT OF COW CENSUS.

F. H. SCRIBNER, Rosendale.

It was with a feeling of a little uneasiness that I entered into this work of taking a cow census. I had imagined considerable objection to prying into the patron's business, and thought perhaps they would tell me it was none of my business, but I found just the reverse. Every one gave me cheerfully all the information I desired and when I began to sum up my report, I learned that it was because a large majority were making money. This fact was not due so much to the large amount of butterfat received, as it was that a large majority were patronizing the cheese factory, and cheese being exceedingly high in price, had brought the butterfat up to between 35c and 36c per pound, which of course was much more than had been received at the creameries. But on the other hand the creamery patron had the benefit of the skimmilk which helped very materially to balance it up.

The figures on the chart do not fairly represent the ability of the cow, as in many cases a large amount of milk was used in the home, and some had vealed calves to the amount of $125.00. The cows were only actually given credit for what was taken to the factory. However the census verified the statement so often made that the average yearly production of butter was below 200 lbs. per cow and the real object of this work which the Wisconsin Dairymen's Association has been investigating for a number of years is why this average is so low, and to see if there is any way of remedying the conditions.

I think I can safely lay all the blame to the man, which is different from what most people would say. In the first place, I found a large majority of men content with trying to dairy with the old fashioned dual-purpose cow, or the one whose ancestry had been along the lines of beef production.

I would not have found so much fault with these men, if they had been raising the steer calves for beef and put them on to the market in a finished condition, but a large majority were letting the calves suck the cows for four or six weeks

and making veal, which I believe in nearly every case, if the milk had been taken to the factory, more money would have been received, and the cow would have done much better by taking the calf away early.

Some carried the idea that about all that was required of a cow, was to be able to stand hardship. They seemed to want a cow that could be turned out in the morning and stay there until night, regardless of the weather and not hump up as those dairy animals do. They wanted them to be tough and I thought as I made this canvass that many had reached the height of their ambition, for they certainly looked tough.

In the second place, a large majority were not feeding properly and the ration for best milk production was all out of balance. When one tries to make a ration of corn and cob meal, ground barley and oats, timothy hay and corn stalks, there is a flaw somewhere in his upper story and I can imagine some of the cows looking up into their owner's faces and saying, "I do hope he won't knock me in the head, for upon my soul, I am doing just as well as I know how with what he gives me."

In the third place, if the care, which is entirely under the control of the man, is not looked after, it spells failure, and if this seemingly less important item than others is ignored, no matter how well bred or fed, best of results cannot be obtained. I went into many yards, where I found the water tank frozen solid. Ice cream is all right, but it hardly pays to make a refrigerator of a cow for that purpose. All the men above the 250 lb. mark, kept their cows in a comfortable barn, well lighted and ventilated, they looked well to the comforts of their cows and believed it an important factor in milk production.

The real objective point we should keep our eye on, is the last column, or the profit end of the business. It matters little how much money a man makes in a year, it is what he saves that really counts. So the cow must be able to return more than the cost of the feed. The returns for $1.00 in feed is sometimes misleading; for instance, No. 23 and No. 24 returned practically the same for $1.00 in feed, but $16 difference in profit per cow. No. 39 made more fat than No. 31, yet No. 31 saved up the most money. No. 15 evidently paid

out enough for feed. What the cows did with it is hard to explain; it was not put into the milk pail and the cows were thin in flesh and to all appearances his high priced feed was absolutely lost. Evidently keeping individual records or belonging to some cow testing association would have done this man good, for from his fifteen cows he only saved $32.85. Of course the experience was worth something and the manure helped the land, but that would hardly satisfy most dairymen.

No. 39 was a genuine cow man and although he only had a little 40-acre farm, yet his income for 1910 was $954.52 from the factory, or a net profit of nearly $600 above the cost of feed, and while I did not approve of his cross-breeding, yet he went at it in a very sensible way. He told me the sire he used was from the best cow he ever sat down under, a pure bred Jersey, and crossed him on Holstein dams. If more would be as careful in the selection of a sire as this man, to get one from the best cow they ever sat down under, or even a little better, be it Jersey, Guernsey, Holstein or Ayrshire, and not letting the pedigree influence them entirely, but look well after the production end, we would soon have more cows in the 300 lb. class.

I like to take an optimistic view of the dairy situation as I found it in this community and believe that things are really growing better. A good many excused themselves for not having cement floors and more light, and having things looking a little better, but they are planning for better things, and in a short time a better condition will exist.

In this census, no one was below the dead line, although a number had crossed the danger line. Of the forty-four herds visited, twelve had silos; eighteen had pure bred dairy sires; twenty-two had a good system of ventilation, and five were keeping individual records of their cows. Nearly every one took dairy or agricultural papers; nearly every one was carrying on some system of rotation of crops; although the past two years had been very unfavorable in securing a clover catch. A few had a small field of alfalfa and wanted more. Some still clung to the idea of letting the manure lie in the yard till fall. A few condemned the silo more through ignorance than anything else. The feeds in most cases were home grown, which of course insures no adulteration, but on the

other hand I know how hard it is to balance up a ration with what feeds are grown on the farm. If alfalfa were grown there would be less objection. Often times by selling off some of the corn, oats or barley, and buying some of the feeds richer in protein, we would make a more economical and better balanced ration.

Name and Price of Feeds Per Ton.

Ground oats	$24 00	Gr. corn and cob	$18 00
Ground barley	26 00	Ground corn	22 00
Bran	24 00	Gluten feed	26 00
Wet malt per bu	.06	Roots	4 00
Mixed hay	12 00	Silage	2 50
Corn stover	3 00	Green corn fodder	2 50
Pasture per mo	1 00		

Patron's No.	No. of cows.	Breed.	When fresh.	Cost of feed.	Returns per cow.	Lbs. fat per cow.	Return for $1 in feed	Profit.
1	10	Jersey	F.	$41 50	$86 72	204	$2 08	$45 21
2	10	Shorthorn and Hol	S. & F.	37 70	50 88	167	1 35	13 18
3	16	Mixed	W.	26 90	68 88	224	2 54	42 98
4	12	Mixed	S.	37 08	44 70	149	1 20	7 62
5	10	Mixed	S.	34 02	61 57	194	1 80	27 55
6	16	Mixed	S.	30 28	43 98	129	1 45	13 70
7	15	Guernsey	S. & F.	35 25	70 70	215	2 00	35 45
8	9	Mixed	W.	35 60	70 14	214	1 97	34 54
9	7	Shorthorn and Hol	S.	36 85	69 17	202	1 87	32 32
10	14	Shorthorn	W.	34 64	57 51	169	1 66	22 87
11	7	Mixed	F.	41 35	84 79	260	2 05	43 44
12	10	Mixed	S. & F.	37 60	59 11	190	1 57	21 51
13	14	Mixed	S.	30 25	51 05	144	1 21	20 80
14	12	Mixed	S. & F.	32 25	41 81	118	1 29	9 56
15	15	Shorthorn	S.	36 77	38 96	108	1 05	2 19
16	16	Shorthorn	S. & F.	43 97	85 63	239	1 94	41 66
17	16	Guernsey	S. & F.	35 57	75 12	209	2 11	39 55
18	11	Mixed	S. & F.	35 56	70 33	197	1 97	34 77
19	25	Jersey	S. & F.	38 80	75 18	209	1 83	36 38
20	15	Jersey	S. & F.	37 50	72 07	201	1 92	34 57
21	16	Shorthorn and Hol	S.	32 35	30 77	227	2 49	48 42
22	18	Jersey	F.	46 52	109 22	307	2 34	62 70
23	8	Jersey	F.	43 64	92 86	306	2 12	49 22
24	10	Mixed	S.	29 95	63 06	175	2 10	33 11
25	8	Jersey and Hol	S. & F.	35 08	78 68	202	2 24	43 60
26	18	Shorthorn and Hol	S.	35 48	56 36	164	1 58	20 88
27	20	Mixed	S. & F.	39 31	75 10	221	1 98	35 79
28	13	Mixed	S. & F.	31 80	68 04	191	2 11	36 24
29	5	Mixed	S. & F.	37 67	73 96	205	1 96	36 29
30	11	Shorthorn and Hol	S. & F.	34 73	63 63	178	1 83	28 90
31	16	Jersey and Guern.	S. & F.	43 05	131 60	305	3 05	88 55
32	20	Holstein	S. & F.	42 40	91 72	254	2 16	49 32
33	10	Mixed	W.	38 90	66 13	187	1 69	27 23
34	11	Jersey and Sh	W.	29 34	64 05	179	2 18	34 71
35	8	Jersey and Sh	S.	26 35	53 77	151	2 04	27 42
36	13	Shorthorn and Hol	S.	27 87	49 96	140	1 79	22 09
37	10	Mixed	S.	27 85	52 33	147	1 88	24 48
38	13	Mixed	S. & F.	39 42	72 16	212	2 23	32 74
39	8	Jersey and Hol	S. & S.	45 97	119 31	330	2 59	73 34
40	8	Mixed	S.	38 35	76 23	214	1 98	37 88
41	8	Mixed	W. & S.	29 92	52 56	158	1 75	22 64
42	12	Jersey	S. & F.	36 01	52 45	169	1 45	16 44
43	17	Mixed	S. & F.	26 07	61 52	187	2 33	35 45
44	19	Mixed	S. & F.	30 88	52 62	168	1 81	21 74

Adjourned to 1:30 o'clock p. m.
The Convention met at 1:30 p. m., same day.
The President in the Chair.

DISCUSSION.

A Member: When I visited the State Hospital, they had seventy-two cows there, and they were feeding silage. As we passed through the barns we noticed the silage was about a foot deep in the manger, and at the same time they were hauling dry corn fodder out of the field in the winter, and cutting it up for the cattle. The man claimed corn fodder was the best feed and said, "Silage is no good. When we feed bran, we put that on top of it, and the cows eat it off."

Mr. Scribner: If my wife fed me that way, there would be a divorce in our family. When I don't eat up everything clean at one meal, I don't want it handed to me on the same dirty plate the next day. Properly fed, there is no question but that ensilage is good feed.

Mr. Blakely: Is there any trouble about feeding silage in making milk for the cheese factory or creamery? I think they do refuse it at the condenseries.

Mr. Scribner: They did, but they don't now, and when silage is handled properly there is no trouble about it. That word "properly" wants to be emphasized, and that is true in feeding anything. We can abuse ensilage in the feeding, and not only that, but a man who is a good silo man must be ready to put in his corn at just the right time. I know of one farmer near here, who cut his corn down about two weeks ahead of the time it should have been cut; then when he went to set up his machinery, something broke down and he had to send to Ohio for a casting and by the time it got back and ready to put in his corn, it wasn't fit for silage. Another trouble is putting it in too dry. A man must use brains in putting up silage as well as in feeding it.

I use a broom in my barn every day. If any ensilage has been spilt on the floor, I have it swept away. An ensilage feeder must be clean.

A Member: What time do you cut your corn for ensilage?

Mr. Scribner: Our rule is when about one-third of the ears are dented, or perhaps some of the husks of the first ears are beginning to turn a little white, or some of the lower leaves are getting a little yellow. We find if we put it in too green, that is, when the corn is in the milk, we have very sour ensilage; the nearer ripe it is, the better it is, though there must be a certain amount of juice in the stalk to have it heat up properly, and if you strike it just at the right time, you will have good ensilage.

The President: In your convassing, in making up this census, did you find that the man who was feeding the cheapest was the man that got the largest returns?

Mr. Scribner: No, as a rule it was the reverse; almost every time the man who was feeding liberally, was the man who received the best returns. The mark you want to keep your eye on is the net profit. It doesn't make any difference about how much a man earns in a year, it is what he saves that counts, whether he saves it from his cows or some other business.

The President: I notice on your chart a man is paying $46 for feed, also one who is not spending nearly as much as that. Are the returns as much more in proportion?

Mr. Scribner: There is another point right there. In considering this question of liberal feeding, lots of people say, "I am not going to milk my cows much through the winter, and then I won't need to feed them very well. I will just winter them through and get my milk in the spring." Some of them figure so closely they think they have done a mighty good job if they just get them through the winter without starving them to death. They entirely forget the old saying, which is just as true as can be, that an animal well wintered is half summered, and an animal well summered, is half wintered. If a cow is poor during the winter, she will be still poorer when she freshens and it is impossible for her to produce a good lot of milk under these circumstances; it is simply out of the question. I know that in some seasons feed is very high, but we keep on feeding just the same, though we may not get big results for the time being, but we know from past experiences that we will get them later on.

Mr. Comings: Generous and skimpy feeding has been talked about here. It strikes me that most of those figures indicate pretty skimpy feeding. I can't feed cows 365 days in the year with proper feed for any such amount as is indicated on that chart.

Mr. Scribner: Most farmers would think that that chart gives figures altogether too high, it looks like an awful feed bill to a good many men when it comes up to $45 or $46.

Professor Boss: Those figures refer to feed only, I understand.

Mr. Comings: Professor, do you think that those figures are heavy enough for generous keep?

Professor Boss: No, I don't think there is one there high enough for a cow's feed, and the average, I am sure, is too low. In Minnesota, the average cost of feed runs nearly to $50.

Mr. Scribner: But there are some other things to be taken into consideration. The time of freshening makes a great deal of difference. If a man has a cow freshen in the spring, he doesn't feed very liberally through the winter, and her feed in summer is mostly pasture. The cost is more for the fall cow than for the spring cow and the kinds of feed have a good deal to do with it also.

Mr. Clark: Hay is very expensive feed for what you get out of it, while silage is one of the cheapest feeds.

Professor Boss: At what values have you figured those feeds?

Mr. Scribner: The figures given here are what they will bring on the market in their locality. You will notice one herd was pretty well down toward the low water mark; here is a man right here, No. 15, with an average cost of feed of $36.77, and his returns per cow, only $38.96, consequently he received $1.05 for every dollar's worth of feed he used. He didn't lose money on the actual feed, but he certainly didn't get rich on it.

A Member: Do you charge anything for pasture?

Mr. Scribner: Yes, I figure the pasture at $1.00 a month, or five dollars for the season.

A Member: Will it pay to feed a cow grain when she has plenty of good pasture?

Mr. Scribner: I say not. I think there is a time when a cow is getting all the green, succulent feed she needs on pasture, and it is better to eliminate the grain for a while. It is a good thing to get the grain cleaned out of her, and then a little later on, when the grass begins to get dry, feed her some grain. It might be better to substitute a soiling crop, but as a rule we soil through our silo. It is always handy, always ready. If you undertake to raise a soiling crop, that is, a crop like green clover, green rye or green oats, there will be a lot of real nasty days in the year in which you must handle this stuff and by the time you handle it over three or four times, the cows won't relish it very much.

A Member: A little dry hay won't hurt them any.

Mr. Scribner: Oh, no, when they are eating green, juicy grass they will steal hay; they relish it every once in a while.

The President: How long do you think it advisable to keep cows in the stable in the winter?

Mr. Scribner: Not over twenty-four hours every day. I don't believe a man is going to get the best results out of a dairy cow if she is put out in cold, bad weather. I believe they are better off, more comfortable and better taken care of when they are kept in the barn. I have seen them in snow-storms, even this time of the year, and I don't believe it is right. I never like to go into a man's barn and hear him make excuses, "I know I haven't the right kind of cattle." "I know my barn hasn't the right kind of ventilation." I like to go into a man's barn and to know by the way he talks that he is proud of his cows, his barn and everything, and there isn't much hope for him until he gets that pride; when he gets it then something worth while will be doing.

A Member: In going around as you did, did you find any barns where the owner objected to your going into them?

Mr. Scribner: Oh, yes, ventilation is quite a question; too few barns are properly ventilated. Then again, I have found men who keep their hogs, horses and cows all in the same barn. A hog is a very filthy thing to have in a cow barn, unless a man is extremely careful. I have been in places where the hogs were rooting through the manure and scattering it all over the barns, keeping them filthy all the time. Those are not good conditions in which to do milking.

A Member: I have been told by dairy farmers that you couldn't make sanitary butter by using silage.

Mr. Scribner: Well, I don't believe it. My business for a number of years, has been to furnish cream for city trade, and if anything in the world is a critical business, it is just that business. You can make butter out of pretty poor cream but when you take your oat meal at a high-toned hotel and pour cream onto it, there isn't anything in the world that will show quicker any kind of taint in the cream. We have been furnishing cream for that kind of trade and it has been from cows fed silage about thirty years, and we haven't had any difficulty whatever.

The President: If you will feed the right way, you can give even cabbage to cows, but it mustn't be rotten or frozen, or you will certainly have trouble. It is the spoiled ensilage and the moldy grain that do the damage. I don't care what the feed is if it is not in good shape, moldy or damaged, it won't do for a dairy animal.

A Member: Isn't it a fact that in some places the silo is so near the cow barn that the odor comes into the barn?

Mr. Scribner: That may be true, but you want the silo close to the barn. Of course you must have a system of ventilation to take this bad odor away from your stable.

Mr. Searles: Would you feed silage at any particular time to avoid tainting cream or milk?

Mr. Scribner: You can feed it whenever you feel like it. I acknowledge this is a subject upon which men disagree very much, but I know that with us in the cream trade, which is the most particular trade in the world, it makes no difference. I feed my cows ensilage the first thing in the morning, and we milk while they eat it. We do the same thing at night, and never have had a bit of trouble. I fully believe that the reason is because we use a lot of care in feeding it. We do not slobber it along in the alleyways nor leave it lying around, neither do we give a cow any more than she ought to eat, and eat up clean.

A Member: I feed my cows after milking, morning and night. I was at Racine two years ago, and they were building a silo at the hospital, but objected to having it in the barn.

Mr. Scribner: I want mine right up snug, with just a little feed room between, so everything will be convenient and handy. I can shut it off with a partition.

Mr. Michels: These odors can be avoided entirely if you use the flue of the silo as a ventilator, and when you are in the barn you will never know that there is any silage anywhere about. It not only does away with silage odors in the barn but it also keeps the silage from freezing.

The President: We are fortunate in having with us this afternoon two men from Minnesota who are doing splendid work in the Agricultural School. A few years ago at Madison I heard Professor Babcock give one of the most interesting lectures I ever heard on the formation of milk in the udder, and Dr. Reynolds of Minnesota, is going to speak to us this afternoon on that same subject.

THE UDDER AND MILK SECRETION.

Dr. H. M. Reynolds, College of Agriculture, University of Minnesota, St. Paul.

Structure of the Cow's Udder.

It may be helpful to a correct understanding of the milk glands to know that they are closely related to skin structures and that the milk producing glands are similar in part to the skin sweat glands and in part to the skin oil producing glands. The milk secreting structure of the cow's udder is to be regarded as a process of evolution from simple surface skin.

It may not be quite pleasant to know that many things are excreted through the udder. Science knows no likes or dislikes and has no quavers of feeling. Everyone knows that some medicines given to a cow or to a human mother are readily excreted in the milk,—in fact we occasionally give medicines to the nursing calf or baby in this way.

The cow's udder consists of gland tissues proper; i. e., the milk secreting tissues and a connective frame work, together

with blood vessels, lymph vessels and nerves. The cow's udder is divided into two lateral halves, the partition extending lengthwise of the body. Each lateral half of the udder is encased in a tough, fibrous sack,—a sort of capsule and each side half has two glands; the front and back quarters which are not separated by partitions like the two side halves.

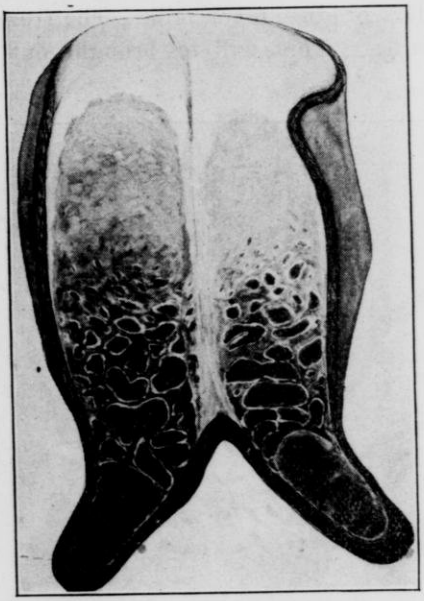

Fig. 1.—Section through the front quarters of cow's udder; crosswise of the body.

The internal structure of each quarter shows that it is divided into distinct masses of gland tissue, and these distinct masses, which we call lobes, are again divided into smaller lobes or lobules. There is one outlet milk duct, or tube, for each lobule. It is through these small milk ducts that the milk from each quarter passes on its way to the milk cistern at the base of the teat.

The mammary glands are undeveloped and rudimentary until maturity and become active, as a rule, in the manufacture of milk towards the close of the first pregnancy.

From the strong capsule, the fibrous sack, which surrounds each side half of udder, layers of this same tissue branch off and extend into and all through each quarter constituting the

coarser frame work of that quarter. The relative amount of this connective tissue, i. e., frame work tissue, varies greatly in different udders, and varies at different periods of life in the same udder. The farmer who understands this general structure of the cow's udder will easily understand why some cows with large udders produce little milk, and other cows with small udders produce much milk. The frame work tissue produces no milk. That will be brought out more clearly later.

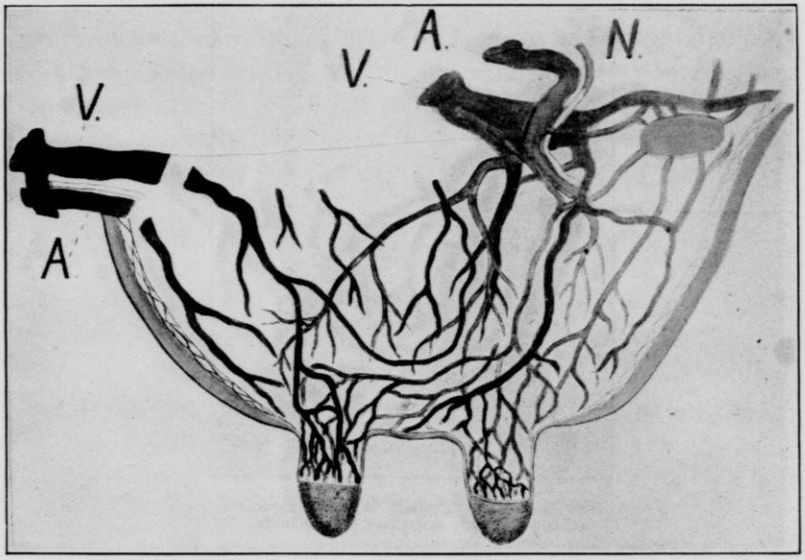

Fig. 2.—Circulation of blood in cow's udder. "V" veins; "A" arteries; "N" nerve. Vein at the left is the one which extends under the cow's belly, commonly known as the milk vein. Note close relation between nerves and blood vessels.

Most of you are probably familiar with the fact that we have within every animal body, two sets of vessels, or tubes, through which fluids circulate. We have the blood vessels and the lymph vessels. The blood vessels act as general distributors, or wholesalers, of food material as well as wholesale collectors of refuse matters. The lymph vessels serve as retailers and small collectors and are immediately concerned in delivery to the manufacturing cells of food material; i. e., raw materials for manufacturing processes. The lymph vessels also collect the waste,—the refuse which is passed on to the blood for excretion.

We have two sets of blood vessels, or tubes, in the cow's udder, as in practically all other structures of the body; i. e., arteries through which flows into the udder pure blood; and we have the veins in which flows back to heart and lungs, the impure blood. There are two sets of lymph vessels; first, the superficial lymph vessels distributed to the capsule or sheath around the udder and to the skin, and another set of lymph vessels which, all through the udder, supply the little bottle shaped groups of milk producing cells which we will name the alveoli.

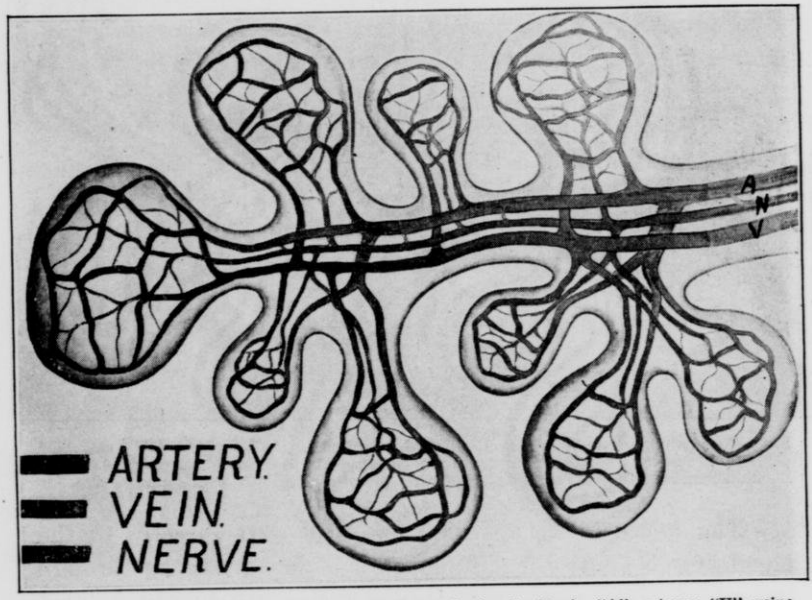

Fig. 3.—Grape-like clusters of alveoli (milk producing bodies.) "A" artery; "V" vein; "N" nerve. Note close relation of nerve supply to blood supply.

The blood vessels split up into finer and finer branches until they are finally miscroscopic in size. We will call these invisible blood vessels, capillaries, the word referring to their hair-like shape. These tiny blood vessels, the capillaries, form net works around the little milk tubes and bottle-shaped groups of milk secreting cells which I called alveoli.

The lymph vessels form tangled mashes of minute lymph vessels, or tubes, in and between the gland lobules and small masses of gland cells. From these lymph vessels, smaller, very

minute, lymph vessels extend to lymph spaces surrounding the little groups of milk cells. These groups of milk cells are arranged in hollow masses not unlike a round water bottle with a long neck. These bottle shaped masses of milk cells will be hereafter referred to as alveoli, meaning small cavities.

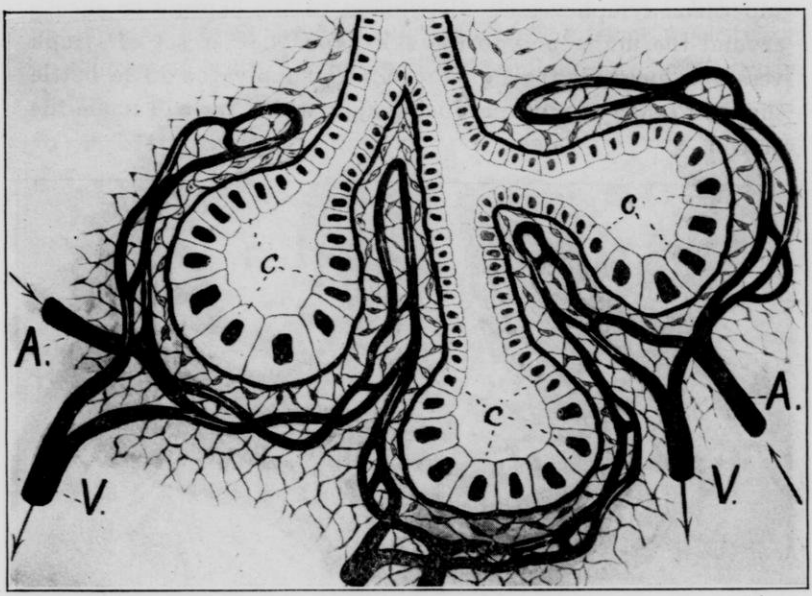

Fig. 4.—Clusters of alveoli in section, split lengthwise. "A" artery; "V" vein; "C" milk producing cells; also frame work tissue mesh filled with lymph fluid, which fluid contains the raw material received from the blood for milk manufacture.

The nerve fibers are distributed in part directly to the blood vessels controlling the amount of blood passing through the udder. The nerve filaments are also distributed in part to the cells which manufacture milk, controlling the work of each cell. This second group of nerve fibers forms tiny bunches of nerve structure just under the milk secreting cells; i. e., between the milk secreting cells and the membrane upon which these cells rest. From these tiny masses of nerve tissue, small nerve threads extend to the cells for the purpose of controlling their work, like telegraph wires from the train dispatcher's office to the local station agents.

Before studying the process of manufacture let us see what there is in milk to be accounted for in the factory.

Composition of Milk.

Herbivorous milk is alkaline. The milk of flesh eating animals is naturally acid in reaction.

We may say that milk consists of milk globules, i. e., fat, and milk plasma, that is water, casein, which is cheese making material, albumin, milk sugar and ash. There are certain proteid or nitrogenous bodies in milk. We know these as milk albumin, and casein from which we make cheese. The proteid or nitrogenous materials make up about 4 parts in 100. Cow's milk usually has about four and one-half parts per hundred of milk sugar, and from three to four parts per hundred of butterfat, varying greatly according to individuality of the cow. Milk contains also a little less than one part per hundred of ash or mineral matter; i. e., calcium, soda, potash, etc., and about 87% water. Colostrum, the first milk drawn after delivery, differs from normal milk in that it contains much nitrogenous matter, especially albumin which coagulates upon boiling, and little fat, sugar or mineral matter.

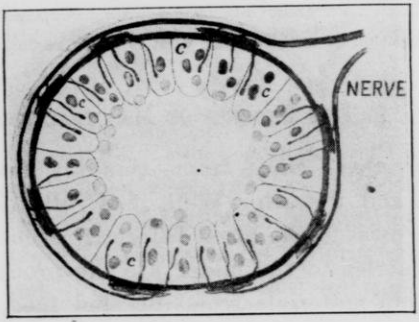

Fig. 5.—Showing nerve distribution to milk manufacturing cells, "C."

Milk fat consists of several different kinds of fat combined and put together in little round masses called milk globules. These globules make up a true emulsion with a film of the liquid portion of the milk between globules. It is interesting to note that ash in the bodies of very young animals corresponds very closely with the ash in the mother's milk, but it is very significant to note also that the ash in the mother's milk differs very widely from the ash of the mother's blood, prov-

ing actual manufacturing processes in the cow's udder, even for the ash.

Now I am going to try to make plain and simple the process of milk formation.

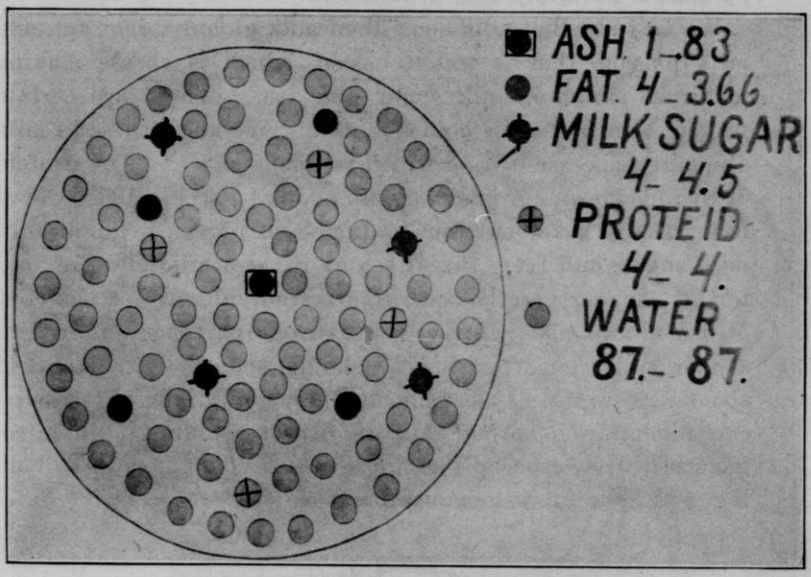

Fig. 6.—Composition of milk showing what is to be accounted for in the factory.

The Process of Manufacture.

Where do these come from—this fat, and sugar, and all this casein, and the ash. Well, it is fully demonstrated that they do not exist in the blood before it reaches the udder. All the blood carries to the udder are the products of digestion, i. e., nutrition materials from digested food, so that back of this manufacturing process in the udder, we must have the digestive process in the stomach and intestines.

It would be interesting for any one who is not familiar with this subject and who wishes to follow it farther, to look up the history of the several food groups, the carbohydrates, the proteids, and the fats, from the time they enter the digestive organs until the digestion products are distributed by the blood, and then see what use the body makes of each one of them—especially what use the udder makes of them.

Before pregnancy the milk glands are composed largely of connective tissues; i. e., the frame work tissue—and a very considerable amount of fat. The milk secreting cells are arranged in hollow groups called alveoli. Each alveolus, as previously described, has something the shape of a long necked water bottle. These are together in clusters with the necks opening into a common outlet tube. The clusters of alveoli are surrounded by masses of fat and frame work tissue.

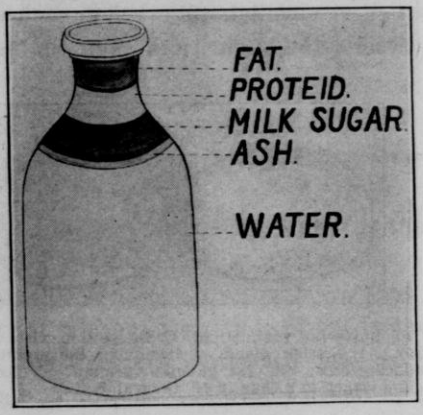

Fig. 7.—Composition of milk, presented in another way.

Before pregnancy these little alveoli and their outlet tubes are blocked with masses of cells. As the period of pregnancy develops these cells divide. Some continue attached to the basement membrane which surrounds each alveolus. Others remain free in the cavities of the alveoli, also in their necks and in their outlet tubes. These loose cells undergo a fatty degeneration and pass out in the first milk as colostrum, with which you are all familiar. Colostrum may appear later in the progress of milking but its formation always indicates a lack of complete and perfect process in manufacture. The cells which remain attached to the basement membrane go into the business of manufacturing fat and other normal constituents of milk.

It seems probable, although it has not been fully and satisfactorily demonstrated, that the processes of milk formation are directly under control of the nervous system, including even the excretion of milk from the milk ducts. It is very cer-

tain that the milk manufacturing and milk discharging processes may be very greatly hindered by disturbances of the nervous system—no question about that. The production of the casein, fat, sugar, and other ingredients of cow's milk is an original manufacturing process and not merely filtration from the blood, for there is no milk sugar, no butterfat, and no casein in the cow's blood when it reaches the udder. The milk manufacturing cells simply take certain elements from the blood and put these elements together in such a way as to form the fat, the casein, the sugar, and even the ash.

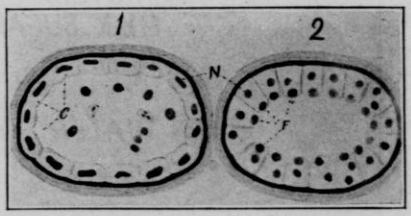

Fig. 8.—Process of butterfat production. Cross section view of an alveolus (milk producing body.) 1. Resting gland. 2. Beginning the production of fat globules. "C" milk producing cells; "F" fat globules forming; "N" cell nucleus. Note that the milk cells are larger in 2 than in 1. Diagrammatic.

There are two processes in milk formation. First: Milk cells, lining the alveoli, or tiny milk cavities, or portions of those cells, undergo fatty changes. The cell manufactures the fat which accumulates in the free end of the cell. The free end of the cell changes into a tiny fat globule and separates from the portion of the cell in contact with the basement membrane. The portion thus left we will call the parent cell. This parent cell then lengthens again and develops another fat cell, at the free end, which in turn separates from the parent cell. You will thus see that this butterfat production is a process of moulting, or shedding, just as the hair sacs produce and shed hair. The fat globules escape into tiny cavities within the udder and thence to the milk cistern at the base of the teats.

It is presumable that some of the parent cells may themselves undergo fatty degeneration and loosen from their basement membrane, and later appear in the milk as globules.

Second: The water, nitrogenous materials, sugar, salts, etc., are formed from the lymph fluid which surrounds each bottle

shaped cluster of milk cells, i. e., the alveoli. When the milk cells which line these little cavities are in the process of active milk secretion, they are large and column shaped instead of flattened ovals as in the resting gland.

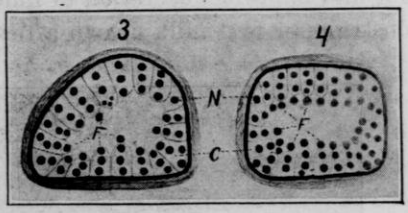

Fig. 9.—Formation of fat globules. Note that milk cells have lengthened still further in 3. In 4 the fat globules have escaped into the cavity. "F" fat globules; "C" milk cell; "N" cell nucleus. Diagrammatic.

I hope that I have succeeded in giving the impression to everyone that the production of milk is clearly a manufacturing process. It has been shown, for instance, that an animal may produce milk fat without a particle of fat in the food. Excess of fat in the diet does not materially increase fat in the milk under normal conditions. Material used in milk formation comes directly from the lymph fluid contained in little spaces surrounding the clusters of milk cells. The lymph fluid receives raw material from the blood and simply passes it on to the milk forming cells over the fence i. e., on the other side of the basement membrane.

The lymph fluid also serves to carry away from the udder tissues waste products and finally returns these to the blood stream for excretion.

A person would very naturally inquire at this point concerning the conditions and influences that affect milk secretion.

Influences Affecting Milk Secretion.

The quantity and quality of milk depends, first of all, upon hereditary peculiarities of the individual cow. After this it depends upon food. It depends upon how long the cow has been milking, upon how long she has been carrying her calf, upon the condition of her nervous system, and to a very great extent upon the quantity of blood passing through the udder.

After a first pregnancy occurs, the milk glands are stimulated to active growth and the little bottle shaped cavities are developed and lined by milk forming cells. Each cell is a little flattened oval shaped body much too small to be seen with the naked eye. Late in the period of pregnancy there develops a scanty and imperfect secretion of fluid which later becomes the colostrum, or first milk drawn after delivery.

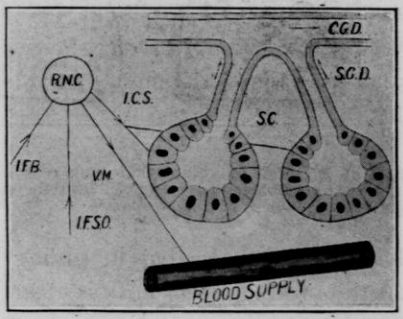

Fig. 10.—Relation between nervous system, blood vessels and milk producing cells. "S. C." milk producing cells. "R. N. C." reflex nerve center; "I. F. B." influence from brain; "I. F. S. O." influence from sense organs, e. g., the skin; "V. N." nerve which controls size of blood vessels; "I. C. S." nerve controlling secretion, i. e., milk manufacture by the cells. Note in Fig. 10 that an impulse, e. g., fright from the brain reaches the reflex nerve center and from there communicates both with the blood vessels and with the milk forming cells. Influence, e. g., chill or irritation from lice, from skin surface also goes into the reflex nerve center and from there communicates with both the blood supply and the milk cells.

The milk manufacturing activity in the cow's udder is directly stimulated by the developments of the embryo within the mother's body. When another pregnancy occurs during the period of milking, some influence from the mother's uterus naturally leads to changes in the composition of milk and, normally, the secretion lessens and stops before the next delivery. This natural tendency to a marked change in the composition of milk and to stoppage of secretion toward the end of a succeeding pregnancy has been partially overcome in the breeding of high type dairy cattle. As a matter of fact long, continued milk production during pregnancy is an abnormal thing physiologically.

Some physiological relation between the milk glands and the womb is very evident, and that the process of milk manufacture is under the control of the nervous system is equally evident. There is reasonable evidence that the milk of the

human mother has been altered in chemical composition or suddenly suppressed by strong emotion. There can be no question but that the nervous system controls the amount of blood flowing through the udder by controlling the size of the blood vessels, the blood vessels being surrounded by circular muscle fibres. These muscle fibres are controlled by their nerve fibres, so that they are made to contract or reduce the size of the vessel or relax and increase the size of the blood vessel; and, of course, the larger the blood vessel, the more capacity it has for carrying blood. This process of enlarging or reducing blood vessels and permitting more or less blood to flow through a certain part is nicely illustrated by the flushed face of a person under embarrassment or the pale face under the stimulation of sudden fright, the difference in color being wholly due to the amount of blood in the blood vessels of the face.

It is very evident to practical dairymen that there must be some intimate relation between the cow's nervous system and her process of milk secretion. You all know that nervous disturbances of any kind are apt to check the milk flow. A crowd of strangers passing through a stable, where high type and highly organized dairy cows are kept, sudden noises, rough handling, all check the processes of milk formation. The only possible connection between the noise outside the animal body and the process of milk manufacture inside her body is by way of the nervous system.

A band of connection and intimate sympathy between the udder and the womb is also found in the common blood which flows through both organs.

Certain investigators (Starling and Lans-Clayton) have shown that an extract from the unborn rabbit injected under the skin of the young female rabbit that has never been bred produces a genuine development of milk glands just as does pregnancy. This seems to prove that some influence from the body of the unborn young, travels by way of the blood and lymph streams and stimulates the milk glands to active growth and preparation for work. This is a most interesting discovery and explains some things that have been very puzzling. Evidently there is some specific, chemical substance formed in

the body of the young animal unborn which stimulates growth and development changes in the udder of the mother. Similar extracts from the afterbirth, and from the womb itself, have no such effect, thus proving that the specific substance which stimulated the udder growth and development must come from the body of the young, unborn animal.

Indications developed in the course of this work point to the fact that this chemical substance in the body of the unborn promotes milk gland growth, but checks milk production. At birth of the young animal, this substance within the body of the young is of course, removed from the body of the mother; and could no longer exert any chemical effect through the blood stream upon the udder. Soon after the foetus is removed from a mother's body, growth and development of the udder stops, and active milk secretion begins. This general statement holds true again in the reverse condition when a second pregnancy occurs and a new foetus is developing within the mother's body. There is a marked tendency to the development of udder structure in preparation for another period of milk production and a tendency to check milk secretion.

One further interesting point may perhaps be mentioned in this study of conditions affecting milk formation. Pressure in the milk ducts and milk cavities within the udder checks the manufacturing process, in the individual milk cells. As soon as milk contained in the udder—and therefore pressure started upon these cells—is removed, then secretion starts again,—in other words, the pressure brake is released, and the wheels begin to revolve again. The act of emptying the cow's udder and merely relieving pressure upon the milk forming cells therefore amounts to a natural stimulus of milk cell activity.

Summary.

I hope to have made clear the general structure of the cow's udder and to have shown that it is not all gland or milk-forming tissue. There is a variable proportion of connective tissue framework and glandular, or milk secreting, tissue. This explains how an udder may be large and inefficient or relatively small and capable of great production.

It is important to remember that the two side halves of the cow's udder are completely separated by strong partition, but the front and back quarters in each half are not so separated. This is important in connection with garget and other diseases of the udder.

It has been my endeavor to make plain the general scheme of circulation of pure blood in the arteries and impure blood in the veins and the circulation of fluid in the lymphatic vessels. It has been shown that the blood acts as general or wholesale distributors or collectors, i. e., distributing to and collecting from lymph fluid in the lymph vessels that lymph fluid acts as the retail distributor of nutritious material and as retail collector of refuse.

The amount of blood flow and the processes of milk formation are under control of the nervous system, and the production of milk is a process of original manufacture, not a mere filtration from the blood. There is no butterfat or casein or milk sugar in the blood which comes to the udder.

I have endeavored to show the process of forming the fat globule in the elongation and rupture of the milk forming cells lining the alveoli and by this rupture furnishing the fat globule. The other milk materials are also formed from the lymph fluid which surrounds the alveoli.

The influences affecting milk secretion, are heredity, food, period of milking, stage of pregnancy, condition of the nervous system, and especially the quantity of blood passing through the udder. I have endeavored to explain a very interesting relation between the unborn young and the development and preparation of the udder for the next process of milking, also the checking effect which some chemical substance within the body of the unborn young animal has upon actual milk formation. When the young animal is born and therefore separated from the mother's body these relations cease, and development and preparation of the udder ceases. At the same time the chemical substance which restrains milk formation is removed, the brake is released and the active secretion of milk is begun. Finally pressure of milk within the udder checks secretion, removal of this pressure stimulates or at least permits secretion.

I may sum up the influences affecting secretion in another way. The amount of milk produced depends upon the amount of blood flowing through the udder. The amount of blood depends upon the size of the blood vessels, and size of blood vessels, is controlled by the nervous system. The composition of milk depends primarily upon the hereditary peculiarities of the cow.

The composition of blood for milk production depends upon the amount and character of food received, thoroughness of digestion, and thoroughness of absorption from intestines into the blood. It should be understood that when we speak of an efficient producer, either a steer producing beef or a cow producing milk, and say that this animal has large digestive capacity, we should really mean large power of assimilating and using digested food. Actual experience and experiments do not indicate that as a rule there is so much difference in actual digestive ability as there is in ability to assimilate.

The amount of milk produced, assuming an abundance of blood and abundance of nutrition in the blood and a dairy tendency, depends upon the actual number of healthy epithelial or milk secreting cells. The number of milk secreting cells for an udder of given size depends upon the relative proportion of the gland tissue and connective tissue. The relative proportion of gland tissue and connective or frame work tissue is presumably a matter of heredity except as the udder is affected by injury or disease.

Finally, ability to digest large amount of food material; the tendency to dairy assimilation; the capacity for large flow of blood through the udder; the tendency to a large number of gland cells within the udder; and the tendency to relatively large proportion of gland tissue as compared with the connective tissue; are all matters hereditary, fixed by a long line of intelligent breeding.

DISCUSSION.

Mr. Michels: Where does the water in milk come from?

Dr. Reynolds: The water comes directly from the blood.

That is the only thing in milk that is not manufactured. The water comes to the blood from the lymph spaces here and from the lymph spaces it extends through the membrane and then is excreted through the cavity of the alveolus.

Mr. Everett: Doctor, you showed us that a large blood circulation is very important, and we judge from that, that a large heart and lungs are also important, and if true, what is their size compared with those in the beef animal, and what is the effect of good or bad ventilation on that lung power as affecting the flow of milk?

Dr. Reynolds: We haven't any positive information that rests on demonstration, so far as I know, which shows the relative sizes and weights of the lungs and heart of a beef animal as compared with the dairy animal. Isn't that true, Professor Boss, so far as you know?

Professor Boss: I do not know anything very reliable. I have made a number of records of that kind and in proportion to the size of the animals, the heart and lungs of the dairy animal are larger than those of the beef animal. Again, the conditions under which animals are kept has very much to do with it. There was one thing quite surprising to me, and that was to find that the chest and lung cavity of animals of the dairy type was much larger correspondingly than those of the beef type; in other words, the width and depth of the chest of the animals of the beef type is composed of the fat of the animal rather than the frame work.

Dr. Reynolds: Of course an abundance of oxygen, or an abundance of good, fresh air will enable the lungs to get rid of the waste to great advantage, and will also supply the oxygen needed in the process of milk manufacture. Of course the cow's capacity to produce depends upon her condition and good health; her ability to digest quantities of feed which is necessary in the production of large quantities of milk, depends on her condition and health.

Mr. Deland: When does this process of elaborating milk take place? It is often stated that it is done only during the process of milking. Is the udder filled with milk during the day, or is it only elaborated during the time of milking?

Dr. Reynolds: A very large proportion of the milk is manu-

factured during the time of the milking. The udder is capable of storing only a comparatively small proportion of the milk which is drawn. The explanation is just this, so far as we can judge: There is of course a certain amount of milk stored in the udder, and when the milk-producing cells are all full, the milk factories are shut down, but the materials are stored in the cells; the cells are full of materials ready to combine and the minute that pressure is relieved and the milk on hand drawn, then those things are put together and rapidly excreted, very rapidly, so that a portion of the milk is manufactured during the time of milking, but everything is all ready just as wood is ready to burn, and when it is touched with a match it burns.

A Member: What causes garget in a cow's bag?

Dr. Reynolds: A very large percentage of garget is caused by infection, as it extends up through the teat into the udder. Sometimes we have what we call an infectious form of garget; it spreads quite rapidly through the herd on the milker's hands. When a man has a cow of that kind, she should always be milked last, and then the hands most thoroughly disinfected. The treatment of garget is rather complicated; plenty of hot water is necessary; foment with hot water morning and evening and give good, full doses of saltpetre to keep the bowels open.

Mr. Everett: I get a good many letters in reference to caked udders, that is, in one-fourth of the udder. Won't you speak of the remedies and the use of the milking tube in connection therewith for the relief of caked udder?

Dr. Reynolds: Well, a caked udder, of course, is practically garget. At the time of calving, there is always naturally some slight condition of garget or caked udder. The worst case of caked udder is simply a natural process gone to extremes. The best treatment is the same as for garget and that is prevention. If a cow is healthy before the calf is born and properly handled then and afterwards, and the udder handled in a perfectly clean way, there isn't much probability of garget. So far as the use of the milk tube is concerned, I am very much opposed to its use. My advice to every one who asks me is never to use a milk tube except as a last resort. Sometimes there is nothing else to do, but there is so much danger

of carrying infection into the udder, which will give a much worse condition than the one you are trying to relieve, that the milk tube should always be considered rather dangerous. If you must use it, boil it thoroughly; the teats should be thoroughly disinfected and the part of the tube which enters the teat should never be touched with the hands, and even with all this care there is a great danger of infection. Experienced men, I think, feel that they should never use the milk tube if they can avoid it.

Mr. Glover: A solution of boracic acid injected into the infected udder would be helpful, would it not?

Dr. Reynolds: I think the most experienced veterinarians are now opposed to the injection of any disinfectant into a cow's udder. Boracic acid at best is a very mild antiseptic, with very limited germ-killing qualities.

A Member: Do we understand that a 3 per cent cow will give milk containing 3 per cent fat on marsh hay?

Dr. Reynolds: I said with normal feed and a good chance, she will continue to be a 3 per cent cow.

A Member: Can you increase that to 5 per cent?

Dr. Reynolds: Not on a well balanced ration, with the cow in normal health.

Mr. Michels: Why is the first milk drawn so much poorer in butterfat than that which comes later?

Dr. Reynolds: That is explained very nicely in this way: A moment ago somebody asked the question whether the milk was all in the udder ready to be drawn, or whether it was manufactured during the process of milking. There is a certain amount of milk stored in this little cavity, but the material from which a great deal more can be made is stored in the little cells. When this milk which is stored in the cavity is drawn off, the cells manufacture more and they work very rapidly in the manufacture of butterfat and casein and milk sugar and ash, and they seem to manufacture those things more rapidly than the water comes from the blood.

Mr. Everett: What are the first noticeable symptoms of milk fever and the first quick remedy?

Dr. Reynolds: First, the cow is a little restless, somewhat uneasy; she steps about a good deal in her stall and walks

with a little irregularity. I might say that even before that you will notice a little constipation. Then comes this expression of uneasiness before she goes down, probably a peculiar expression in the eye, a slight staggering as she walks.

The best treatment for milk fever is prevention. We have a treatment that is very satisfactory, but prevention is much better. One prepared to treat a case of milk fever knows just how to do it. A man who wants to establish a milk record with a cow may be excused perhaps for feeding heavily right up to the time of calving, but the man who wants to prevent milk fever will feed rather lightly for two weeks or so before the calf is born. He should give a diet rather laxative in its effect and a reasonable amount of exercise and with these precautions the cow is not apt to have milk fever. After the calf is born, if the milk pressure in the udder is relieved by milking, there is very little danger of milk fever. It is the cow with a big dairy capacity that is liable to have milk fever; the half-fed, half-starved cow never has milk fever. After the calf is born, there should be no more milk drawn than just what a calf just born will take; the man who follows that rule will practically have no milk fever in his herd. After that first milking and during the next twenty-four hours very, very little should be drawn; then, on the third day, more should be drawn. No matter what the udder is full of, water, or oxygen, or milk, if it is left there, the cow will have no milk fever.

A Member: In the case of a cow twelve years old having the early symptoms that you have described, would you advise treating her again; in other words, is she likely to have the same symptoms and have them worse the next year?

Dr. Reynolds: I think a cow that has had milk fever once is rather more likely to have it again, but I would not discard a cow, if she is a good one, simply because she has had milk fever. I would prevent it the next time by not milking her too much.

A Member: What would you do with a cow's udder that is broken out? Is there anything that can be done to save that quarter?

Dr. Reynolds: Probably not. You simply treat that as

any other abscess or wound,—clean surgical treatment. It is my own opinion that a cow never has garget or any other serious disturbance in the udder and fully recovers from it.

Mr. Scribner: A man told me the other day that when he got ready to dry off a cow, he just quit milking and he never had lost a dairy cow yet. What do you say to that?

Dr. Reynolds: I wouldn't do it.

Mr. Scribner: And I second the motion.

A Member: If she was a persistent milker, and you couldn't dry her off, what then?

Dr. Reynolds: There are not many that you can't dry off by limiting the feed and feeding dry feed. If you can't do anything else, you can give her a little bella donna and that will surely dry her up.

A Member: I had a cow that milked three years steady. I couldn't dry her.

Dr. Reynolds: It would have been better for her and the calf too if she had had a rest period.

Mr. Everett: How long a rest period?

Dr. Reynolds: I am not a practical dairyman. I am a veterinarian, but I would say at least a month.

Mr. Clark: When a cow has some restriction, so that it is hard, sometimes impossible, to milk, would you use milk tubes, or would you use a bistoury to make the holes larger?

Dr. Reynolds: The best treatment for that is simple dilatation. You can get some little cone-shaped tubes of different sizes for that; and have them perfectly clean. They only go up a very little ways into the teat and if you put one of those in half an hour before milking, it will make it very much easier. I don't like the bistoury; it simply makes a little cross-shaped cut which must heal up and the scar makes it worse than it was in the first place. On the other hand, if a cow milks too freely, slightly cauterize the end of the teat, and the scar healing will reduce the size. The whole difficulty is just at the very end of the teat in those hard milkers, not all the way up.

A Member: When a cow has tuberculosis can she raise a healthy calf?

Dr. Reynolds: Yes. But she cannot nurse the calf, nor the

calf cannot stay in the stable with her, but as far as heredity is concerned, it doesn't cut much figure. I see some of you look as if you wanted to scrap on that proposition a little bit, but the fact is, this question of heredity of tuberculosis is simmered down to just this, practically we are pretty sure that heredity of tuberculosis, if it ever amounts to anything at all, which I do not believe, is an increased susceptibility or increased sensitiveness toward tuberculosis, so that infection is a little easier and the development of the disease a little more rapid. A calf from a tuberculous cow ought not theoretically and reasonably be more resistant than the calf from a healthy cow. I will illustrate it in this way. Civilized white people regard measles now as a very trivial affair. For a great many generations we have been gradually developing an immunity to measles, but if a white person goes to Patagonia and carries the measles there, those black people will die like flies with it. I think we are doing the same thing, as we have done with measles, toward smallpox and tuberculosis. That is, gradually developing an immunity toward contagion.

Actual experience shows that a very large proportion of calves can be raised from tuberculous cows if they are not raised on the mother's milk. The same is true of the sire; he may sire a large number of very healthy calves, but must be kept isolated from the rest of the herd; he must be quarantined; it is only with a very valuable bull or cow that a man can afford to go to that trouble and expense. But if it is worth while, it can certainly be done with very little danger.

THE VALUE OF CROP ROTATION.

PROFESSOR ANDREW BOSS, College of Agriculture, University of Minnesota, St. Paul.

The chemist tells us that the value of crop rotation lies in the consequent provision of an abundant supply of organic and mineral matter containing all of the essential elements of plant food; the physicist that it lies in the consequent betterment of the physical texture of the soil, and the bacteriologist

that the value is in the more numerous forms of bacterial life found in a soil upon which the crops have been rotated. The farmer who has practiced a well balanced scheme of crop rotation tells us that the value of rotation lies in the greater net profit per acre returned each year from his land. And each one is right in his way of thinking. Larger yields invariably follow a systematic rotation because the growth of grass crops, including the clovers, results in an accumulation in the soil of roots, leaves and stems of plants which we call vegetable matter. The tillage of cultivated crops following the grass crops in a well planned rotation breaks down this vegetable matter more rapidly, introduces air and moisture freely and hastens fermentation or bacterial action resulting in greater warmth in the soil. As a result decomposition is hastened, available plant food is abundant and the chemist has reason for his statement that the soil fertility has been increased. It is the combination, however, of physical, chemical and bacteriological forces rather than the separate effect of any one of them that gives the results.

As is well known by most people the elements most likely to be lacking in the soil, are nitrogen, phosphoric acid, potash and lime. To show that it would take a long period of time to deplete the normal soil of these elements, I offer the following figures taken from Snyder's Soils and Fertilizers, calling attention also to the fact that most of our farm crops feed in the surface foot of the soil:

Surface—1 foot of soil contains		Crops require annually.	Time to exhaust elements.
		Lbs.	
Nitrogen	5,000—10,000	25—100	50—400 yrs.
Phosphoric Acid	1,000— 9,000	25—	40—360 yrs.
Potash	3,000—18,000	35—60	50—514 yrs.

A study of the figures indicates that most soils contain sufficient of each of the elements to last approximately 200 or more years if all were used. It is common knowledge, however, that only a small proportion of these elements becomes available at one time. Owing to improper tillage and physical condition of the soils there often is a scarcity of available elements

even though a large supply of the essential elements is known to be present in the soil. On new lands the available elements are usually abundant and but little attention is paid to the needs of the growing crops. But on land that has been farmed for some time, the farmer must consider the needs of the crops and so arrange his cropping scheme and till his land as to render available for the growing plants, an abundance of these elements. It is in affording a regular arrangement of crops which can be followed from year to year that crop rotation becomes especially valuable in increasing soil productivity. The matter of making such arrangements is not nearly so difficult as many suppose.

Crop rotation means simply the classification of crops according to their habits of growth and methods of cultivation and systematic and regular change in the order of growth. Crops are classified as (1), Grain crops including wheat, oats, barley, rye, flax or other cereals. (2), Grass and Legume crops including the grasses, clovers and alfalfas commonly grown, and (3), the cultivated crops including corn, potatoes, roots or any other crops requiring intertillage. The grain crops have fibrous roots, feed close to the surface and are almost entirely removed from the land in harvesting. A small amount of stubble and the roots of the plant are returned to the soil so that the amount of vegetable matter is not seriously depleted. They are therefore said to be neutral as to effect on the humus content of the soil. The grass and legume crops through the development of leaves, crowns and tap roots add materially to the vegetable matter of the soil and they are classed as humus builders. The cultivated crops on account of frequent tillage of the land and rapid decomposition, rapidly reduce the amount of vegetable matter in the soil and are therefore said to be humus destroying. It is the proper combination of these three classes of crops in such manner as to provide for the food products required on the farm without depleting the natural productivity that results in increased returns from the soil.

To illustrate the value of rotation of crops, I am going to ask your attention to the results of some work in the crop rotation at University Farm, St. Anthony Park, Minnesota. On

some plots of land we have been growing cultivated crops continuously since 1894. The soil on these plots is becoming devoid of vegetable matter and crop yields are low. This soil bakes easily and is hard to handle. On plots sown to mangels each year, great difficulty is experienced in getting a stand of roots owing to attacks of fungus or parasitic organisms on the germinating seeds. On an adjoining plot where a five-year rotation is practiced, the soil is open and friable, good stands are obtained and yields are quite satisfactory.

The true value of the rotation is shown in the yields of crops grown under the different schemes of cropping. A comparison of the tables submitted herewith will show that rotation increases the yield of each of the three classes of crops materially.

Yields of Wheat in Continuous Cropping and in 3 and 5 Year Rotations Compared.

	Continuous wheat.	Continuous wheat, 6 lbs. clover,	Wheat in 3 year rotation.	Wheat in 5 year rotation.
1900	14.5	19.8	27.3	25.6
1901	16.0	11.3	13.5	15.2
1902	17.0	15.0	18.1	25.1
1903	16.3	24.1	24.4	30.8
1904	20.8	32.5	27.3	32.0
1905	20.8	23.3	20.6	30.9
1906	14.1	15.0	13.3	22.6
1907	24.5	25.3	19.1	23.9
1908	19.1	20.0	22.4	25.0
1909	22.7	25.0	20.3	35.5
10 year average	18.58	21.13	20.63	26.66

3 year rotation, wheat, clover, corn.
5 year rotation, wheat, timothy and clover, pasture, oats, corn. 8 tons barnyard manure on oats stubble.

Yields of Corn in Continuous Cropping and in 3 and 5 Year Rotations Compared.

	Continuous Corn.	Corn in 3 year rotation.	Corn in 5 year rotation.
1900	37.5	42.6	58.
1901	13.9	.....	42.8
1902	Lost	62.0	78.6
1903	23.6	54.7	85.3
1904	11.1	45.1	37.1
1905	25.1	64.1	64.4
1906	27.6	36.1	60.5
1907	23.6	35.2	52.2
1908	33.3	38.6	53.6
1909	41.6	39.2	76.1
	26.4	*46.4	60.8

Average of corn in cont. plots yrs. 1893, '04-'09. 24.5
Average of corn in standard rotation plots. 1899, '04-'09, 60.01.
*Average of 9 years only. Weights of 1901 not used.

Yields of Hay in Continuous Cropping and in 3 and 5-year Rotation Compared.

	Continuous Hay Tons.	3-yr. M. F. Rotation clover Tons,	5-yr. M. F. Clover and Timothy Tons.
1901	.95	1.58	2.36
1902	1.27	2.25	1.95
1903	3.65	3.86	6.10
1904	1.95	4.26	5.77
1905	1.70	4.86	5.81
1906	.....	1.91	2.18
1907	1.10	1.25	1.30
1908	1.55	3.24	5 01
1909	.....	.....	.....
1910	.....	.6	1.00
Av. 10 yrs	1.22	2.33	3.15

Wheat continuously yielded an average of 18.6 bushels per acre. Six pounds of clover sown with the grain in the spring and plowed under in the fall gave an increase of 2.5 bushels per acre or 13½ per cent. Wheat grown in a three-year rotation of wheat, clover and corn for the same years, yielded 20.6 bushels per acre, an increase over continuous cropping of 2 bushels per acre or 11 per cent.

In the five-year rotation, the yield of wheat for this period was 26.6 bushels per acre, an increase of 8 bushels per acre which is 43 per cent over the continuous cropping to wheat, and an increase of practically 30 per cent over the three-year

rotation. The five-year rotation calls for eight tons of barnyard manure preceding the corn crops. The manure and the extra year in grass are doubtless responsible for the increased yields from the five-year rotation.

Corn continuously yielded during the ten years 1900–1909, inclusive, 26.4 bushels per acre. In the three-year rotation of wheat, clover and corn yielded 46.4 bushels or 20.0 bushels more, an increase of 76 per cent due directly to rotation with the use of clover. During the same years in the five-year rotation, the yield was 60.8 bushels per acre or 34.4 bushels per acre more than was grown on the land continuously to corn. This is an increase of 130 per cent. The increase of the five-year over the three-year rotation was 14.4 bushels per acre or 31 per cent.

The yield of hay in the continuous cropping plan was 1.22 tons per acre as compared with 2.33 tons in the three-year rotation and 3.15 tons in the five-year rotation. This shows an increase of 1.1 tons per acre or 91 per cent in favor of the three-year rotation and 1.9 tons or 158 per cent in favor of the five-year rotation. The five-year rotation is .8 tons or 35 per cent more productive than the three-year rotation.

To make the comparison in another way, a short rotation (three years) without manure, increased the wheat yield 11 per cent, the corn yield 76 per cent and the hay yield 91 per cent. A five-year rotation in which eight tons of barnyard manure is applied once in the rotation, the increase is 43 per cent on the wheat crop, 130 per cent on the corn crop, and 158 per cent on the hay crop.

The difference between the values of the three and five-year rotations and in favor of the five-year rotation is 30 per cent on the wheat crop, 31 per cent on the corn crop and 35 per cent on the hay crop.

This seems perhaps like a mass of figures and percentages but it indicates clearly to me that rotation of crops alone, without manure, has a marked value in increasing production. And that a combination of rotation and manures properly applied will practically double the yields of all of our crops.

Couple with this value the more even distribution of labor throughout the year, the less expensive handling of the crops, the reduction of weeds and crop pests and the possibility of

producing a product of higher grade where good rotation schemes are followed and you have a suggestion of the value of crop rotation.

DISCUSSION.

Mr. Everett: Would you follow a grain crop with clover and apply manure on the clover?

Professor Boss: Why, yes. This three-year rotation that I have mentioned is weak. Of course there is grain first, then clover, and then corn. We have purposely made it weak to get the effect of the clover in the soil. I believe that the proper three-year rotation should include a grain crop, a grass crop and a place for manure before growing the cultivated crop. The five-year rotation should always include a manure crop; I don't know of any other way of getting back to the soil what you have taken from it, except to grow a crop and let it die and return it to the soil. If you don't do that, you must put it back in manure and if you don't feed all your crop on the farm and put the residue back, you must buy something to put on the soil to keep up the fertility. You might as well regard your farm as a bank, and that the farm contains much fertility. Whatever you sell from the farm, takes away as much fertility as is required to produce it.

Mr. Everett: At Madison yesterday, Forest Henry of your state spoke very strenuously against a three-year rotation which includes clover, and he ran up against an awful snag among the Wisconsin farmers, many of whom have practiced, as long as forty years, this three-year rotation including clover. What do you think about that?

Professor Boss: Well, we haven't struck it yet. We have not really grown clover continually. We have grown it in a three-year rotation since 1900 and haven't seen any harmful effects so far. I am not quite sure what the result is going to be in this three-year corn rotation; we are not increasing any in the yield of corn, and I have noticed during the last two corn years,—though we haven't had quite normal conditions, being a little dry,—the corn on that particular plat didn't seem

to be as healthy looking as on the land of the five-year rotation that had manure. I am a little skeptical about the land getting clover sick in a three-year rotation. Mr. Henry, I suppose, bases his statement on his own experience. He lives in a part of the state where the soil is somewhat heavier and naturally a little more sour and wet than it is with us.

Mr. Everett: He also advises against plowing under green clover, because he says it makes the soil sour.

Professor Boss: I think he is right there in certain kinds of soil. I remember distinctly plowing under a heavy crop of mammoth clover and putting the land in such condition that we could not raise corn for three years afterward.

Mr. Glover: Can't you use ground limestone to correct the acid condition?

Professor Boss: There are things that can be used to correct it, but what we like to do is to arrange a system of farming that will give us the right conditions without having to use the lime.

Mr. Glover: Do you think it possible to do that?

Professor Boss: I don't know. It has been possible so far. We believe that a man who goes into a new country and begins to farm does not meet many of the problems that confront the old farmer. We can be profligate for a few years and not see bad effects, but when we have been in the country fifty, sixty or seventy years, then comes a time when we have to consider lime and other commercial fertilizers that were not necessary at first, and that is what I am expecting to find in this three-year rotation. I don't know how long it will go; I think in about twenty years we will have to add something.

Mr. Glover: Dr. Hopkins is a very strong advocate of lime for old soils.

Professor Boss: The lime of course helps in the physical condition of the soil.

Mr. Everett: Would you apply the pulverized lime rock or pulverized lime?

Professor Boss: I believe the results are quite as good and the dangers to the crop much less in applying pulverized limestone.

Mr. Everett: Would you plow it under or apply it to the surface?

Professor Boss: I would apply it to the surface, though I don't know as it makes any difference. We find that we get decidedly better results with all our applications of manure by applying to the surface after plowing. I will have to qualify that statement by adding that the manure from our barns is composted before it is spread, which means of course that it is rotted. We are forced to do that. I do not advocate that for farmers in general, but we are forced to that, because of the fact that we want manure for the various rotation plots and for the fields which are under experiment where we must know exactly what we are dealing with. We keep about 225 head of cattle, about 200 sheep and 30 or 35 head of horses and a couple hundred hogs. To obtain an even grade of manure, we make a pile about sixteen to twenty feet wide. We start it in the fall and keep putting it on that pile until spring. Then in the spring we start another pile and keep it going until fall, so that each is rotted and ready for distribution when we are ready for it and the weed seeds are all killed.

Mr. Everett: I want to make a statement. At Waukesha, where they have large lime rock quarries, they have a lot of pulverized lime rock refuse, and wherever it was spilled on grass good results were shown in the growth of grass and weeds. The owner of the quarry brought me a sample of it, and said he had thousands of tons of it. He wanted to know what it was, but as I didn't know I sent it to Professor Whitson of Madison. He said it did not contain any particular fertilizer but it was beneficial to all soils. The owner of the quarry is pulverizing it and the farmers are drawing it away by the wagon load. They are getting wonderful results. Professor Whitson says it is correcting the acidity of the soil a great deal and it is very cheap.

Professor Boss: I had better explain our position on this subject of the commercial fertilizer, of which lime would be considered as one. On our Minnesota soils, which are comparatively new, we have so far derived very little benefit from commercial fertilizers. Professor Snyder carried on quite an extensive system of preliminary trials and on land in good nor-

mal condition and where clover and other crops had been grown, he obtained practically no results from the use of any kinds of fertilizers. On land depleted, sour, or out of condition, benefits are obtained. That brings up the point that any one whose soil is not giving good results would do well to have it analyzed and find out what the trouble is; then apply commercial fertilizers according to prescription from somebody who knows what and the amount the soil needs. The miscellaneous purchase of rock or any kind of commercial fertilizer many times is money wasted. You ought to know your soil and just what it needs in order to get the right fertilizer.

A Member: How can a farmer ascertain whether his soil is sour?

Professor Boss: He can get instructions from the college and make the test himself by the use of litmus paper; or, better still, if in doubt—I know our Minnesota station will gladly test a sample of soil for acidity if it is sent in, and very likely your own station will do the same. Any farmer can get a piece of blue litmus paper at a drug store and make a test. If the soil is sour the paper will turn red.

Mr. Michels: How long would you let alfalfa alone?

Professor Boss: As long as it was doing well. It is not so convenient in rotation as clover; you couldn't use it in a three-year rotation very well for several reasons: the seed is more expensive; it doesn't make as much growth the first year, perhaps, as clover does; it would require a year or two before it begins to yield well. If I were going to use alfalfa in the rotation, I would plan on cutting it for at least three years in order to get what I wanted out of it. That can be done easily in a three-year rotation by providing a long rotation. Take a seven- or eight-year rotation and you will have no difficulty in working in three years of alfalfa; it would be a rotation within a rotation. We have rotations in Minnesota where we leave timothy and clover for four years. Alfalfa is a little hard to get started; the first winter is a precarious time, sometimes it dies out. If you get a good stand, I would advise you to leave it at least three years because you may have trouble in getting as good a stand the next time, and

there is no danger of alfalfa being crowded out by blue grass or weeds during that time.

Mr. Everett: I think it is better to turn it over at the end of three years, or four, anyway, because where it is left longer, it is awfully hard to plow.

Professor Boss: I think if we are going to work it into a rotation it would be better to settle on the policy of using it only three or four years at the most, because we do not grow alfalfa only for the crop; we grow it for the benefit of the land. Cut it down at three years and change it so that in course of time it goes all over your farm. The best crops of roots we ever had were raised on land that had grown alfalfa four years.

Mr. Goodrich: I want to say something on this question of rotation with alfalfa. I have kept pretty still today. One of my sons keeps half of his farm in alfalfa. He keeps a field three years in alfalfa, two years in corn, one year in small grain, and after the small grain is cut off (for the last three years) he has sowed alfalfa in the fall and he has had excellent results. Now, in following up alfalfa, the ground is fitted in the best shape for other crops. I know one day when I was out there he was plowing up some alfalfa that was eight or ten inches high, a beautiful stand, and a man came along and said, "Why, Goodrich, are you crazy?" He says, "I don't know, that is for other folks to say." "Well," the man said, "I think you are." "What makes you think so?" "Why, you are plowing up this beautiful stand of alfalfa; what are you doing that for?" "So as to raise a big crop of corn."

Now, I want to tell you, last July when I was there,—and you know we had some pretty hot weather last summer,—I took a ten-foot pole the 7th day of July and went into his corn field where he had plowed up alfalfa and the corn was nine feet high. I came back to Wisconsin and found the corn about two feet high. Well, I ought to say the weather was a little better out there in western Iowa, but there was no other field of corn anywhere around there that was anywhere near as high as that where he had plowed up his alfalfa field.

A Member: Wasn't your statement a little misleading when you said that the chemist might be able to tell the farmer the

trouble with his soil? As I understand it, a chemist could analyze a brick and find it rich in plant food but it wouldn't help us much about raising crops in that kind of soil.

Professor Boss: You can often get advice from the chemists which would help you, but the settlement of the question must always come by experiment, by test. The best test of land arises in trying it out, but what I was trying to convey was the idea that it is not wise to buy commercial fertilizers miscellaneously; spend a lot of money on your land without knowing whether it really needs that kind of stuff or not.

At this point in the proceedings, Miss Lutie Stearns of Madison addressed the meeting on behalf of the Traveling Library of Wisconsin, urging the farmers to send in their applications that they might enjoy the benefits of this great privilege.

Adjourned to Friday, February 10, 1911, at 10 o'clock a. m.

The Convention met at 10 o'clock a. m., February 10, 1911.

The President in the Chair.

Prayer by the Rev. Mr. Martin.

The chair called for reports of committees and the following were submitted and acted upon:

Report of Auditing Committee, finding the treasurer's books and accounts to be correct, were submitted and unanimously adopted.

Report of Nominating Committee received and unanimously adopted, the following gentlemen being thereby elected officers of the Association for the ensuing year: President, H. D. Griswold, West Salem; Secretary, A. J. Glover, Fort Atkinson; Treasurer, H. K. Loomis, Sheboygan Falls.

Report of Committee on Resolutions was presented and adopted as follows:

Resolved, That the Wisconsin Dairymen's Association desires to place upon its records and in its published proceedings its testimony to the efficiency and unflagging zeal in the discharge

of the duties of his office by the present Dairy and Food Commissioner of Wisconsin, Honorable J. Q. Emery. Unlike too many incumbents of similar offices, with their multitude of details and embarrassments, it is worthy of especial mention that Commissioner Emery has not grown stale or despondent, but every succeeding year has given increasing and conclusive evidence of the value and importance to the people of the state of the laws enacted by them and enforced by him for their protection from fraud and deception in the manufacture and sale of food stuffs, beverages and medicine. This association, representing as it sincerely believes the largely predominating sentiment of the dairy industry in Wisconsin as well as the personal convictions of those in attendance at its 39th annual convention, respectfully urge the reappointment of Commissioner Emery to the office whose duties he has so faithfully discharged.

Resolved, That the Wisconsin Dairymen's Association assembled in its 39th annual convention respectfully represents to the Congress of the United States its profound conviction that in the interest of honesty and commercial morality there can be no honorable compromise between the advocates of pure dairy products and the manufacturers and sellers of oleomargarine until it is made difficult if not impossible for oleomargarine to masquerade as butter. The dairymen of the United States are willing to accept all the results of honest competition, but they protest that a substitute for butter so cunningly devised and colored that its true origin and composition cannot be detected except by scientific experts, cannot be considered as honest competition. They therefore respectfully petition Congress to enact legislation that shall effectually safeguard the public and especially those of limited means from imposition, either by totally prohibiting the manufacture of oleomargarine in any shade of yellow resembling butter or by placing such a tax upon the colored article as shall make its manufacture unprofitable.

Resolved, That the Wisconsin Dairymen's Association in its 39th annual convention realizing that the fertility of the soil of Wisconsin is becoming poorer each year, and that in the near future farmers will be compelled to use commercial fertilizers.

Therefore we would petition the members of Congress from our state to use every effort in their power to prevent the sale to private or corporate interest, the nitrate and phosphate beds on the public domain. That the phosphates and nitrates being mined should be sold under such restrictions as to further guard against their exhaustion, thereby depriving the American farmer the needed elements to restore soil fertility.

Resolved, That we members of the Wisconsin Dairymen's Association assembled in annual convention do hereby extend to Ex-Governor Hoard, former president of this association, words of cheer and comfort in these later days of a life so full of good words and works along the lines of dairy gospel.

We feel our incompetency and utter inability to express our appreciation of the work of one who has done more for the dairy industry than any living man. And realizing such we wish to extend to him our appreciation of this good work.

WHEREAS, The tuberculin test is looked upon by some as unreliable and inaccurate, and they are using their influence to have the present law repealed.

WHEREAS, This association believes that this opposition is due more to misrepresentation of the law and unwarranted prejudice than the real facts of the case warrant. Therefore be it

Resolved, That this association at its 39th annual meeting recommend and strongly endorse the present law and further recommend more accurate inspection in the examination of slaughtered animals which we believe would have a tendency to overcome this prejudice.

F. H. SCRIBNER
W. H. CLARK
A. W. ANDERSON
M. L. WELLES
Committee.

HOW I MANAGE A FORTY-ACRE FARM.

WILLIAM KAMMER, Milton Junction.

Ladies and Gentlemen:—When Mr. Glover wrote to me to take part in this program, I felt it rather a hard job, as I had never done anything of this kind before; and I must say I feel even worse this morning when I come right near to it.

I have not been a farmer very long, only eight years. My trade used to be the butcher trade. I learned it as a boy over twenty years ago. I ran a meat market in Janesville thirteen years, until Mr. Thorpe, who owned the farm I am now on wanted to trade with me. I looked at the farm and it suited me all right; so, two months after, we made a trade. I didn't know anything about farming but thought I could learn. There were seven cows on the farm; I couldn't milk, but my wife could; she could milk six while I was doing one. Everything went just the same. Sometimes I felt pretty blue, but I knew the only way was to learn, so I started in to learn the best I could. I subscribed for some good farm papers; I like to read German, so I got two German papers; and later on I heard of Hoard's Dairyman and subscribed for it. That paper taught me how to feed and take care of cows. I think no dairyman should try to get along without it, not that I am here to advertise that paper, but I got so much good out of it I can't help talking about it.

When I commenced we had four or five acres of pasture, but found I couldn't feed my cows all summer on that. Having so little land then, I could harldy afford to let more than that lie, so thought I would try to feed them in the yard all the time, as long as I had to part of the time. So I started that way; the next year I fed them in the yard. I tried to raise the feed for them, but I couldn't make that go very well. I had no silage, but the next year I heard of that wonderful plant, alfalfa, and learned about silos. So I planted some alfalfa and built a silo, and then there was no trouble at all to keep cows in the yard. I wanted some cash crops to get money to buy

feed, so I raised three or four acres of sugar beets, two or three acres of potatoes and some rutabagas. I wanted to get all the feed for my cows off the farm in some shape. Sugar beet tops were very good feed for the cows. The early potatoes being cleared off early, I planted corn on that land. On the land that I had corn on for my silo, I plowed that in the fall as soon as the corn was put in the silo and sowed it to rye, and that makes nice feed in the spring when the cows like green feed, and after that I put in corn again. Then on land I had beets the year before, I sowed oats and peas as early as I could, and with that I will feed my cows way into July anyway. And on that land, if the weather is any ways decent, we will get corn or millet on there and rutabagas—they grow pretty late. In that way, with my alfalfa and feeding silage all summer, I get along very nicely. Alfalfa comes in when the other feeds are gone, and it always grows.

Of course to make money out of cows, a person ought to have pretty good cows, because it doesn't pay to feed cows that don't pay for their feed. I read in Hoard's Dairyman that it pays best to breed to a full bred sire, and so I got that kind. I raise the heifer calves of my best cows and in that way get good cows. I have twelve cows now; last winter I had seven.

I have always read in Hoard's Dairyman that you ought to have plenty of air and light for the cows to do well. When I went onto my farm, the barn was very dark, so I built a new barn, with plenty of windows and the King system of ventilation.

I soon find that if I do not feed my cows and milk them regularly, they don't do so well; they go down on their milk, and you can't bring them up again very easily. For the winter, I manage to have good juicy feed for them. I generally start to harvest my beets around the first of October, and I like to have my cows come in fresh at that time. Beet tops are very good feed to start fresh cows with. Then when the beet tops are gone, I get beet pulp from the factory, and that is very good for the cows. Then when the pulp is gone, I open my silo, so I have good juicy feed all winter for my cows, and with alfalfa and corn fodder they do pretty well. Then, when

spring comes, I put them on that rye and oats pasture and they come up like fresh cows again.

When I plant corn for the silo I drill it in with a driller as thick as I can because I like all the stuff I can get off from the land for my silo.

In raising feed that way and feeding that way, I can keep quite a lot of cattle; I can keep sixteen cows easily enough and raise six or more heifer calves every year and fatten about twenty hogs. I keep three horses and keep chickens enough to keep my family in groceries and such things.

Of course, having the cows in the yard, a fellow has to be a little careful. I generally have three yards a quarter acre big. When they are in one yard, I sow the others to something and then cut it off, and then put the cows back on that land and it is fresh again and it keeps them healthier, I think.

I suppose there are many things I don't know about yet, I know I can learn a good deal more.

DISCUSSION.

The President: Tell us what you are getting from your cows.

Mr. Kammer: I didn't bring along any figures showing that, because I was afraid I would get stuck; but a year ago I milked eight cows in the winter and I got $154 to $158 per month for five months for my cream. I separate my milk and use the skimmilk for my pigs, and when I get out of pigs I go around and try to buy some young calves and fatten them up with skimmilk. I start with a little cracked corn and then give them shelled corn, all they want to eat, and it makes nice calves and I get $10 for an eight-weeks' old calf, and that is all right.

Mr. Glover: What do you do with your cream?

Mr. Kammer: I sell it to the co-operative creamery at Milton Junction.

Mr. Glover: And what price do you get?

Mr. Kammer: I get Elgin price.

A Member: Do you think you do better by keeping the cows in the yards or in the barn, in the summer time?

Mr. Kammer: Well, if the flies are very bad, I put them in the barn during the day and have the barn good and dark. It is a little more work, but it pays. When I do that I put them out at night. I have an open shed in the yard.

A Member: Do you have any trouble in keeping them clean in the yard?

Mr. Kammer: Oh, no. You must keep your yard clean. I have one yard that I call the winter yard, because it is well boarded up. I put them in there nights and in some muddy weather. I have that slanted up pretty well, so the water can run off, but I put all that on my alfalfa field and my yard is always clean. I use a little lime around the yards too, and that makes a clean smell.

The President: You spoke about having rye for pasture.

Mr. Kammer: Not for pasture. I cut it green and feed it to my cows; cut it before it gets too hard. I sow it in thick, about two bushels to the acre, and it is like a sod.

Mr. Goodrich: Does green rye ever make a bad flavor in the milk?

Mr. Kammer: I never had any trouble with any kind of feed except when fed rutabagas and carrots. I have had a little trouble with them but I changed and fed them after milking, and then everything was all right.

Mr. Goodrich: You feed grain with your rye, I suppose?

Mr. Kammer: Well, no, not in summer. I feed grain in the winter to my cows. I feed bran, corn meal and gluten feed in winter. I don't feed a bit of grain in summer, but I have silage for them and rye and oats and peas. You see, in the oats and peas they get nice little peas in there and it is pretty nice feed and the cows always do well on it. Right early in the spring when the feed is so juicy, I didn't see any reason why I should feed them grain; they are always well.

Mr. Goodrich: How many pounds of grain do you feed in the winter?

Mr. Kammer: I feed four pounds a day to my three-year-olds, and I have a couple of old cows that I am giving eight pounds apiece to.

Mr. Goodrich: Don't you find your silo 14 feet in diameter, a little big for that number of cattle?

Mr. Kammer: In the summer it is a little big.

Mr. Glover: How much are you getting out of your twelve cows this winter, per month?

Mr. Kammer: I am only milking eight now, seven, really; one is about dry. I used to take my cows to my neighbor, he had a very good sire. They had abortion over there and I didn't know it, and that threw me off the track. From these seven, with that stripper, I am getting a little better than $100 a month all this winter, but you see they are only three-year-olds. I had to sell my old cows on account of that trouble; I didn't want to take any risk.

Mr. Aderhold: Is your farm all under cultivation?

Mr. Kammer: Yes.

Mr. Aderhold: You never turn the cows out on the farm?

Mr. Kammer: No.

Mr. Aderhold: Do you find it much work to carry all their feed to them?

Mr. Kammer: Why no, it doesn't seem to be. I have two girls at home, one is sixteen, the other about eleven and they help me. I take my mower on the field and cut down a few swaths and take the horse and rake it, and my little girl takes one old horse and goes down there and loads up. I have a shed in the yard and she drives right up to the long manger and throws it in, all the green feed that way. I did my own work last summer, with the exception of the haying, and the digging of the beets; I am a little fellow and it hurts my back.

A Member: How much is your income per year?

Mr. Kammer: I don't keep books that way, but I can pretty near guess. We take in close to $3,000. If we have good luck, the rutabagas bring a lot of money, but last year was so dry they got tough and we couldn't sell them. I fed them to my cattle and they are awful good feed for cows. I had 53 tons of sugar beets off three and a half acres, and I got $6.07 a ton. They tested over 15 per cent. I sold them to the Madison factory.

A Member: They pay five dollars and something don't they?

Mr. Kammer: Well, the beets are supposed to test 14 per

cent for their regular price and every per cent over 14 they give more.

A Member: What did you do with those cows that aborted?

Mr. Kammer: I sold them to stock buyers.

A Member: Do you raise and sell calves for breeding?

Mr. Kammer: I have never sold calves. I have kept them always till they come up to the second time coming in and then I sell them.

A Member: What breed of cows have you got?

Mr. Kammer: I keep Jerseys. They are my pets.

Mr. Clark: Can you tell about how many pounds of butterfat they give a month?

Mr. Kammer: Well, I have a little piece of paper on which I put down some things. I belong to a testing association and the man just happened to be there the day before I came up here, and he said, "I better give you a little paper if they should ask you some questions." He just got started at my place four months ago. The first month he came was in November. The average daily milk was 39.2 a day, the next month 36.4, the next 38.7 and the last 34.9. That is for one three-year old. Her monthly milk was, first month, 1279; next, 1092; 1200 and 1081. Her average test the first month was 4.4; 4.4 the next month; 4.6 and 5 this last month. The butterfat was 51.1 first month, 48 the next, 55.2 next and 54 this last month. That was a three-year-old grade cow. I have no thoroughbreds, but they are raised from a thoroughbred sire. The next one, her daily milk, was, first month, 23.1, 19.7, 17.7 and 15.9. She got sick during the time and came down like everything. Her month's milk was 693 first month, 591, 548 and 492. Her average test was 6.6 first month; 6, 6.2 another month and 6.6 the last month. Her butterfat was 45.7, 35.4, 34 and 32.5. This heifer's daily milk was 17.2, 16.4, 14.3 and 14.4; monthly milk, 516, 492, 443 and 446. Average test a month was 6.4, 5.6, 5.8 and 6.2. Her butterfat was 33 the first month, 21.9, 25.7 and 27.6. This other cow, first month, 24 a day, 23.8, 21.7 and 19.6; first month's milk 723, 714, 672 and 607. This was a cow that aborted in the fall, too. She was always such a high tester I didn't like to sell her. The first month's test was 6.8, 6.6, 6.7 and 7.2. The butterfat was 92.3, 47.1, 44.4, and 43.4. I have got another one that isn't quite three years; first daily milk 22.7, 26, ?3,

22.6; monthly milk 671, 780, 713 and 700; test, 5, 5.6, 4.8 and 5.2; butterfat, 33.5, 40.6, 32.2 and 36.4.

Another little heifer the first month's daily milk 24.6, 26.7, 24.4 and 23; monthly, 738, 801, 756 and 713; average test, first month, 6.6, 5.9, 5.2 and 5.4; butterfat 48.7, 47.2, 39.2 and 38.5. There is another one, she was nearly dry, and no use, I guess —she made good money too, but these are all young, little fellows. I had some awful nice old cows that I couldn't make any headway with, and I had to sell them.

Mr. Michels: How do you happen to get so many good high testers?

Mr. Kammer: I kept sorting them out. I have been there eight years and for two years I wasted my time, because I didn't know much. As soon as I got Hoard's Dairyman it was explained so nicely in there what farmers ought to know about what their cows are doing and about feeding cows, that it helped me a lot. I knew that one cow was better than another perhaps, but I didn't know about feeding; I did not know whether a certain cow paid me or not. I went out to Gov. Hoard's barn and looked around there and there on a paper I saw their ration was so much bran, so much oats and so much other things. It opened my eyes. I thought there must be something to it and when I saw them weigh their milk there and thought how nice it would be to know just how much a cow was giving, I went and bought a scale, and now I can do that too; I can't do without it. I tell you it is an awful good thing; when you find out a cow is giving a little less milk you begin to think there must be something the matter, and you look right after her, before anything very bad gets the matter, just as soon as you find it out and there is something wrong.

Mr. Aderhold: You are mighty lucky you didn't know anything about farming when you started in.

Mr. Kammer: Well, I didn't for a fact.

Mr. Clark: How do you make that out, Mr. Aderhold?

Mr. Goodrich: Why, he didn't have anything to unlearn, and it would be better for a good many farmers if they would begin by unlearning everything they know.

Mr. Aderhold: What I mean is, he realizes that he did not know much about it, and so he was willing to learn. Now if a man will just get it into his noodle that he doesn't know anything

and is willing to learn he will learn a good deal more and this man knew enough to get what he wanted to learn from the right quarters where he could learn it right. There isn't a man here but if he would just go to work and take a little advice, make up his mind he doesn't know anything about it, and go out as this man did, take the milk sheet and the scales and study up on feeding and eliminate his poor cows, he will make twice as much from his cows in two years' time as he is doing now.

Mr. Kammer: Of course I had to learn and I wanted to learn quick, because I had no money to fall back on and I had to figure on getting a little out of the farm.

A Member: Do you use a manure spreader on the forty-acre farm?

Mr. Kammer: Yes, I wouldn't be without one.

A Member: How early do you commence to cut your rye?

Mr. Kammer: Oh, just before it commences to make joints.

A Member: How old will that be?

Mr. Kammer: According to the years. You know some years we have winter yet in April, and last spring it came right along until the end of May and then again it may be the middle of June before you get it in.

A Member: Then it doesn't come ahead of the alfalfa?

Mr. Kammer: Well, no, but you see I never cut my first two crops of alfalfa for feeding purposes, I expect to get that in the barn for hay, and lots of times I sell hay to buy back some feed for my cows to make up that way to get money off the farm, because I don't need all the hay I raise.

A Member: Don't you think you would do better to raise some grain in place of that rye?

Mr. Kammer: I have a small farm. If I put in five or ten acres of grain, it will take just as big a force to come to thresh it as if I had a whole lot, and I can buy it cheaper than raise it. Sometimes I sow a little piece of barley with alfalfa when I get a new piece of alfalfa. My alfalfa generally stands about four years. Then I generally put that into potatoes the first year after that; it takes some hard work but you get some potatoes.

A Member: How often do you cut your alfalfa?

Mr. Kammer: I generally cut it four times but not last year.

A Member: Which was your shortest crop last year, the second or the last crop?

Mr. Kammer: The crop was pretty much all alike; none of it was as heavy as it ought to be.

Mr. Comings: I think the secretary and the program committee ought to be congratulated for having induced this gentleman to present to this audience an ideal method of farming a small farm, and really a vote of thanks ought to be given to Mr. Kammer for talking in such a practical way about the carrying out of his ideal farm.

CONSTRUCTING A CONCRETE SILO.

MATH. MICHELS, PEEBLES.

For the past thirty years, much has been said and written regarding the value of silos and silage, but today, it would be time wasted to dwell at length, on this point, for it is conceded everywhere by dairy farmers that the silo has come to stay. It is not a question as to whether or not the farmer can afford to build a silo, but whether he can afford to be without one. By the use of the silo, the dairyman can feed his stock a palatable and a succulent feed the year round. Silage, having the same feeding value as well as the same laxative and corrective qualities as green grass, makes it equal to good pasture.

Silage is superior to soiling crops as it gives better yields, saves much time in the cutting and the feeding, and is likely to be fed more regularly as it is always close at hand. Furthermore, the quality of feed remains uniform from day to day, while in the case of both pasture and soiling crops the quality as well as the quantity are entirely dependent upon weather conditions.

As far as is known, the first silo built in the United States was by a Mr. Morris of Maryland in 1876. About five years later, the building of silos was taken up by the experiment stations, but, while many silos were built soon after, it was not until recently that the farmers generally turned their attention to silo construction.

Mistakes in Building and Filling Silos.

There have been two main reasons why the dairy farmers did not turn their attention more generally to the silo question in earlier years:—First, because of the mistakes made in building silos; second, because of the many mistakes made in filling.

Some twenty years ago, when the first silos were built in my home county (Fond du Lac) the round type which we see everywhere today, was not known and the silos then built were square and of wood. On account of the enormous pressure of the silage on the sides of these square structures the corners would open up, not only allowing the air to enter and spoil the silage, but also wrecking the silo within a few years. Next came a round silo built of wood which was quite an improvement over the square type but not altogether satisfactory since dry rot would set in, making it necessary to replace poor boards and repair about every three or four years. With the advent of the cement plastered and stave silos, all other types of wooden silos were discarded. These were followed by stone and brick silos, but of late years the concrete silo has not only proven as good as any other, but can be built for less money, and, if put up right, will last for generations to come.

The second reason why dairy farmers did not turn more generally to the building of silos ten or fifteen years ago, was because of the mistakes made in filling, such as cutting too green or overripe, not tramping enough or distributing evenly while filling and the planting of large, coarse fodder corn which is entirely unsuited for silage purposes.

Twin Silos.

The advantages of building twin silos or two silos side by side, instead of one, may be summed up as follows:—

First—You can have the same capacity with less diameter, hence less silage is exposed at the surface, which means much especially for summer feeding.

Second—It is not necessary to build so high, saving power in filling and the trouble of climbing so high at feeding time.

Third—Only one feeding chute is required, and this is formed without expense by the triangular space between the walls of the

silos and the barn. This also makes a very satisfactory ventilating shaft.

Fourth—The silage will not freeze as easily, as about one-fourth of the circumference of the silos is practically in as warm a place as the barn may be, especially where the chute is used as a ventilator shaft.

Fifth—Both silos can be filled from one setting of the machinery at filling time.

Sixth—Each one of the silos can be completely emptied at least once every two years, allowing an opportunity for cleaning and cement washing if necessary.

Location.

Wherever possible, the silo should be located in a sheltered place, as it has a great bearing on the extent to which the silage will freeze. A silo that is built on the west side of the barn where it is exposed to the coldest winds even if it is built with dead air spaces, will freeze more than one built of solid concrete if it is sheltered.

Description.

Last year we built two silos of the solid concrete type. These silos are built close together and up against the side of the barn. The walls are six inches thick all the way around with the exception of distances of about 14 inches on each side of the continuous opening for doors where they widen to eight inches.

The extra thickness at this point is needed not only to strengthen the wall but also to get more foot room for climbing up and down at feeding time. The continuous opening for doors are two feet six inches wide. Across this opening are three-fourths-inch rods two feet apart. They go into the walls about six or eight inches and are hook shaped in order to hold the loops on the ends of the reinforcing wires. We used No. five wire for reinforcing, connecting one to every rod running across the door and one between, to within ten feet of the top. These reinforcing wires should be laid as close to the outside as possible without danger of chipping or exposing the wire to the air. This is about one and one-half inches from the outside. On the top, about six or eight feet apart, set in bolts to

hold down the roof. These bolts should be about 12 inches long by one-half inch in diameter and should be bedded in the concrete heads down, leaving the threaded ends sticking out long enough to hold the roof plate.

Silo Forms.

I have here a model of the forms made by Mr. Imrie of our Farmers' Institute Force. They are very simple and can easily be made or can be rented for $15 to $25. Although wooden forms make a good silo, a smoother and nicer job can be made if they are faced with thin sheet iron of 28 or 30 guage. Use 18 or 20 guage galvanized sheet iron for the outside form. Full information for the making of the forms will be found on Page 131 of Farmers' Institute Bulletin No. 24. Where two sets of forms are used, no staging is necessary, but where only one set is used, staging is required to hold up the forms.

Mixing the Concrete.

We used a mixture of one part of good fresh Portland cement to six parts gravel as it came from the pit, without any screening. This gravel contained some sand as well as some coarse gravel stones the size of hen's eggs or larger. It is of great importance that you use nothing but fresh cement in any kind of concrete work. For mixing make a platform large enough so that you can use up a bag of cement at a time. Make a hollow frame about four feet square of six-inch boards. Lay this frame on the platform and shovel into it the required amount of gravel, and over the top distribute a bag of cement. Then lift off the frame and thoroughly mix while dry and again while the water is being added. If a continuous mixer is used (which I think is the handiest mixer yet devised for small jobs) you can shovel directly from this pile of gravel with the cement on top into the mixer.

Construction.

It is of the utmost importance that the foundation be not only solid but also perfectly level. If it is started level, it will be smooth sailing way up to the top. If it is only a little out of the way at the bottom, the silo will tend to lean toward one side

and this can be corrected only with difficulty after the walls have been started. In starting the foundation, we did not use the outside forms for the first five feet, filling in the entire space between the inside forms and the ground. We threw in as many field stones as we could sink out of sight into the concrete. This made the wall a foot thick in some places. To make the wedges we simply put up six-inch planks across the opening and filled in the space with concrete. This makes the spaces between the silos and between the barn and the silos air tight.

Cost of Constructing Twin Silos.

The size of each of the two silos we built last summer was 14 feet 10 inches inside diameter, by 30 feet high. They hold 100 tons each and the cost of the two was as follows:—

80 bbls cement @ $1.20		$96 00
Rent of forms		25 00
Rent of mixer @ $.50 per day		6 00
Rods and turn buckles		6 50
No. 5 reinforcing wire @ $1.65 per cwt		4 00
Labor		100 00
Total cost up to roofs		$237 50
Roofs—		
Lumber	$32 00	
Roofing (2-ply)	15 75	
Nails	1 25	
Carpenter work	30 00	
Cost of roofs		$80 00
Cost of silos complete		$317 50

The above costs include floors in silos, the chute and the wedges already referred to.

It took three men twelve days to do the concrete work and two men five and one-half days to build the roofs. The cost as given above does not include the board for the men. Neither have I charged up my own labor for digging the foundation and hauling the forty loads of gravel that were required.

Discussion.

Mr. Goodrich: The walls of your silo are solid concrete?

Mr. Michels: Yes, no air spaces.

Mr. Goodrich: Does it ever freeze through?

Mr. Michels: So far there has been no frost in mine this win-

ter to speak of. After we opened the second silo, it froze a little just around the outside for a few days but it was hardly noticeable. Today there is no frost in it at all. The silage next to the wall and doors is just as perfect as anywhere else.

A Member: Do you plaster the inside?

Mr. Michels: We simply give it a cement wash, no plastering at all; no trowel used from top to bottom, simply a cement wash inside and outside after the concrete work is done.

A Member: I have heard some complaint of its spoiling badly next to the wall under those circumstances. A good many think a concrete silo with an air space in it will prevent freezing, but even if it freezes it doesn't hurt it much.

Mr. Michels: I think there are quite a few here who are thinking of building silos and to them I would like to say a few words on the subject of keeping out frost. The location of the silo has more to do with keeping out frost than any method or any material that you may use to build with. One day last winter I took the pains, after a long continuous cold spell that we had, to visit several silos. In a stave silo built on the west side of a barn, I found about five or six inches of frost on the north as well as the east, well, practically all around, except about four inches on the south side. From there I visited a stone silo also built on the west side of a barn, and that had about fourteen inches of frost on both the west and the north side, and ten or twelve inches on the south side. From there I drove to a solid concrete silo, built the same with the exception of an eight-inch wall, two inches thicker, and this was in rather a warm place, it was sheltered by the surrounding buildings and there was practically no frost in that silo. Then I visited another stone silo and that had about fourteen inches of frost. From there I visited two cement block silos. These were not of the hollow block type, but they were better. They were built with two straight tiers of blocks from top to bottom, making a continuous dead air space of four inches, no breaks in it, and I think that ought to make the best kind of air space. One of these is built on the south side of a barn and the other one on the west side of the barn. The one on the south side of the barn showed but very little frost, while the other one, which was exposed to the cold west winds had seven or eight inches of frost in it. This shows that it is a question of location more than any-

thing else, when we come to consider the question of keeping out frost.

Mr. Aderhold: In the western part of the state I found a silo built of concrete blocks, it was eighteen inches narrower on top than on the bottom on the inside. Do you think that is any advantage?

Mr. Michels: That certainly is all wrong. When the silage settles, it settles away from the wall. I think the silo ought to be just as straight as possible. Some think it should be wider on top than at the bottom, so that it may settle closer, but it doesn't seem to settle right, and from my experience I should say that the best way is to build the silo as straight up and down as we can get it.

Mr. Comings: The cement companies advise, in the little books they send out, vertical re-enforcement. Is there anything in that?

Mr. Michels: I should think it certainly would not do any harm, and it would cost but very little. I think you could perhaps get along with a four-inch wire, and the few wires you would stick in there wouldn't cost much.

Mr. Loomis: There is a good deal more pressure in a silo than in another kind of construction, and in the large buildings they are putting up of concrete, they are using both vertical and horizontal re-enforcement.

Mr. Michels: Yes, that is true. There is practically no pressure up and down that I can see and I haven't thought it was necessary, or I would have put it in. The pressure is toward the outside, and if it is equally distributed, it doesn't look to me as though it was necessary.

A Member: Don't you think the frost can be prevented a great deal in your silo by keeping the silage near the wall lower?

Mr. Michels: Yes, just a few inches lower; that will do a great deal toward keeping out frost, but you usually find the opposite to be the case when the silage near the wall is a little bit higher than the inside. The frost does not come so much through the wall as from the top, therefore it is necessary to have the top protected to keep the cold winds out. Even in one of those stone silos, after I got about a foot and a half deep, there was no more frost; the foot on top was where the frost came in.

A Member: Don't any of you put on a concrete chute?

Mr. Michels: Yes, we have it.

A Member: We can't all afford to build two silos like you have; if there is only one, how about the chute?

Mr. Michels: If you take pains to figure out the amount of cement it takes to build this chute, and all the rest, you will find it costs nearly as much to build one silo as to build two of the same capacity as the one, and if you use lumber roofs it will probably cost you a little more.

A Member: What is the matter with a cement roof?

Mr. Michels: If I were building again, I would build a cement roof. The lumber roofs cost me $80 apiece, and it is the only thing that can wear out.

A Member: I have been studying silos for the last three years and kept pretty close count in building a concrete silo with concrete chute from the ground to the roof, and considering work and everything, it cost in the neighborhood of $300.

Mr. Michels: These two silos cost me $317.50, and I had everything done, except that I dug the foundation and hauled the gravel. I had three men do this work; I paid one $2.50 a day, and another $2.75, and the boss got $3.00 a day. I boarded them.

A Member: In our section, we have men who do nothing but put up silos. They do the work for $110, and it takes about forty barrels of cement and about forty loads of gravel. These silos are 14 by 35, and it costs in the neighborhood of $210, without the roofs and the chute. I think we could do better than that if we could get the men, but as a rule it is a little handier to get a crew like that. Of course we could do it cheaper ourselves, if we could get the right kind of help.

Mr. Michels: One thing that has kept farmers from building silos has been the expense, and another thing has been the mistakes made in the building of the silos.

A Member: Do you know if concrete silos crack?

Mr. Michels: I have heard of it, but I never saw it. If a foundation isn't good, it stands to reason it will crack.

Mr. Goodrich. I know of two that are cracked, but I guess they can be fixed up.

Mr. Michels: It seems to me they could be filled up with cement.

A Member: I never had one that cracked. Of course we reenforce them a good deal heavier than you do. I took three No. 9 wires and put them in every foot clear to the top.

Mr. Michels: I used single No. 5 wire every three feet, which is more than your three wires No. 9.

A Member: What do you think about a stave silo?

Mr. Michels: The only objection I have to them is the expense of keeping them in repair.

A Member: They are cheaper.

Mr. Michels: Not in my case.

A Member: Would you have any objection to putting a silo in one corner of your barn, if you had plenty of room?

Mr. Michels: I don't know whether I would like that even if I had room.

Mr. Griswold: I have one in the corner of my barn and I like it. There is no objection to having it in the barn and you save roofing.

A Member: Doesn't the steam from the ensilage make frost on the roof?

Mr. Griswold: Not to do any harm. The frost comes in a little on the north side. Mine is twenty-four feet high.

A Member: Wouldn't there be more waste of silage in a double silo like that than in a deeper single silo.

Mr. Griswold: That would depend. If you had just one silo and made it large enough and about the right size, it would be all right. Of course, some would be wasted if you couldn't feed it off fast enough.

Mr. Michels: The trouble comes in the summer time. It spoils more quickly than it does in the winter.

A Member: What the gentleman means is that there would be the tops of two silos exposed instead of one.

Mr. Michels: Where you have two silos, the chances are you could arrange things so they wouldn't both be exposed at the same time. Just as soon as we had one silo filled, we commenced feeding right away and kept feeding right along. There is no trouble when you feed all summer.

Recess to 1:30 o'clock p. m.

The convention met at 1:30 o'clock p. m., February 10, 1911. President Griswold in the chair.

THE DAIRYMEN'S RESPONSIBILITIES

E. L. Aderhold, Neenah.

The last biennial report of the Dairy and Food Commission contains the dairy statistics for the year 1909 of each county in Wisconsin. From that report it appears that Sheboygan is the banner county in dairy production; also that she produces more milk per cow and per acre than does any other county in the state.

The receipts for cheese and butter manufactured in said county, together with the value of milk and cream consumed as such, brings the total value of her dairy products up to a figure slightly in excess of $2,500,000. It amounts to $5,000 for each square mile of territory in the county and approximately 4,800 pounds of milk per cow, containing 170 pounds of milk fat. The average net returns from the cheese factory was near $61.00 per cow.

The record for this county is very creditable when compared with that of other dairy sections, yet when compared with records made by certain individual dairymen in said county, it does not seem worth bragging about, for there are hundreds of dairies there yielding an average of from 6,000 to 7,000 pounds of milk per cow, year after year.

It follows then that there must be a great deal of mighty poor dairying done to bring the average production per cow down to 4,800 pounds.

Some of the cow keepers in said county are by no means entitled to be called dairymen, for their stables are dark and filthy; their cows are filthy scrubs, and I have seen herds of cows there that were starved down to a condition bordering on disease.

It would be easy to communicate evidence tending to show that in very many Sheboygan county dairies, the cows are handicapped by unsuitable housing and improper or stingy feeding.

There are scattering dairymen in that county who secure an average of about 8,000 pounds of milk per cow and $100.00 net returns from the cheese factory. Such records have been

made with cows that could not be called "half blood," where no individual records were kept and where alfalfa hay and corn silage did not enter into the feed ration.

With better breeding individual records and with the liberal use of the two above named feeds, even these highest named records would be appreciably increased and the food cost per unit of milk materially reduced, because alfalfa hay and corn silage together are among the very best milk producing feeds and are at present the cheapest feeds we can grow.

Just Supposing.

Supposing all the cow owners in said county would use only pure bred dairy bulls, keep individual records of cows, grow alfalfa hay, supply corn silage enough to fill the needs of winter and summer, house the cows in sanitary and comfortable winter quarters, what would be the result?

Within six years of systematic application of such methods, the production would be easily increased fifty per cent, which practically would be a clear gain, because the feed cost would be increased slightly.

Would It Pay?

Subtracting an assumed feed cost of $40.00 from $61.00 earnings, the profit per cow in 1909 was $21; with net returns of $90.00, the profit would be doubled. With the same number of cows, the same range of prices that obtained in 1909 and a like proportion of milk manufactured into cheese and butter, the total value of Sheboygan county dairy products would have climbed from $2,500,000 to $3,750,000. Incidentally the value of her cattle because of greatly improved dairy qualities, would be increased at least $500,000.

The foregoing discussion shows plainly that Sheboygan county milk producers have only made a beginning in the exploitation of their dairy possibilities and that being an "average" dairyman isn't anything worth bragging about when with a little common sense and a little earnest effort one can do so very much better than the average. And what shall we say of those who are below the average and seem perfectly contented to remain in that class?

Winnebago County.

With equally as good opportunities, this county is behind Sheboygan county in the production per cow. The statistics from a cheese factory located a short distance from Neenah, which is operated twelve months a year show only 3,900 pounds of milk per cow, containing 152 pounds of milk fat. The patrons of this factory must be keeping a number of cows that do not pay for their board.

The Square Deal.

Any great industry, in order to endure, should have integrity for a foundation. By integrity in dairying I mean that the consumer shall be satisfied with his purchase, he knowing all the conditions connected with its source or manufacture.

Several years ago a dairyman was arrested for selling cream that came from a very nasty separator. He fought the case, lost out, and when the judge pronounced the penalty he threw in this meaty benediction:—"The consumer of dairy products has no means of ascertaining the history thereof. He is at the mercy of the producer. Unless you know your cream to be clean and wholesome you should not offer it for sale." The foundation of that dairyman's business was not integrity. It was deception.

In our work of inspection when we find a dirty meat market, the owner is usually anxious to promise that he will clean it up promptly. He sells his wares in his immediate neighborhood and cannot afford the advertisement which might follow if he continued to conduct his establishment in opposition to sanitary laws.

The bulk of dairy products, however, are consumed many miles from their source, which renders it easy to deceive consumers and promotes recklessness in the production thereof.

Upton Sinclair appointed himself a committee of one to investigate the condition of certain Chicago packing establishments. That in itself was unimportant, but when he made known to the public the results of said investigation, the government got busy and things began to improve at a lively pace. The result was good for the consumers.

Publicity that benefits consumers surely benefits its produc-

ers and trade in general, unless they rely on deception in the sale of their goods.

This is a day of organizations. In some cities, people are organizing under the name of "Consumers' Leagues." It would not be much in advance of the spirit of the times if the work of such organizations resulted in the appointment of committees whose duty it would be to investigate conditions connected with the source, preparation for sale and marketing of food products.

Suppose distant consumers would send committees into the dairy states to investigate conditions along dairy lines. Would it be possible for a livery man to start out from any point and show such committee a dozen cow barns that are a credit to the industry, without encountering a number of barns of a very different type unless he is a past master of the art of dodging?

What impressions would such a committee receive when it got into townships where it is more difficult to find half a dozen cow barns that are reasonably sanitary, with clean cows, than it is to find two dozen barns that are all around unsanitary with a very bad, filthy floor and filthy cows?

Would it whet their appetites for dairy products if they saw a milker sitting between two such cows with filth under him, behind him, in front of him and above him, with filthy hands, manipulating a filthy surface above the milk pail? Would the marketing of such milk appeal to them as a square deal?

If they undertook to estimate the percentage of milkers that actually strive to prevent dirt, dust, etc., falling from the flank and udder into the milk pail, would they put it at twenty per cent, or would it be nearer five per cent?

Would they sanction the use of unclean cream separators as practiced in a majority of separator dairies? Would it make their mouths water if they examined the slime in the separator bowl at one of those scattering dairies where they separate cream four times before they wash the separator? Would they sanction the marketing of such cream as food for man?

After investigating dairy separator premises in localities where the only consideration in the stationing of said machines was convenience to the source of milk and to the feeding of the skimmilk, it found separators in unsanitary cow barns, often containing filthy horse stalls, calf pens and sometimes chickens, would they

be surprised if they found a separator that was used as a hitching post for calves or that was stationed in a pig pen?

And when they got the measure of that man at the creamery, that buttermaker, who, with contempt for the cleanliness practiced by some of his patrons, contempt for law, contempt for the consuming public, contempt for his profession and with no self-respect, sends his haulers out to gather in this cream, with absolute indifference as to quality, mixes it all together and manufactures it into butter, because he knows he can fool the consumer; when they got his perfect measure and painted his picture according to their true conception of him, what would that picture look like?

If such committees should, in hot weather, happen to arrive at one of those cheese factories where many tons of whey had flooded the soil, and got a good whiff of the predominating odor, could they ever thereafter think of a cheese factory without recollecting that whiff?

And, by the way, if a cheese factory patron is a contemptible cuss, by what better means can he demonstrate that fact than by leaving his whey to befoul the cheese factory premises and the cheesemakers' dooryard.

And if these committees should run across a cheese factory that is in the possession of flies to such an extent that nothing in it can be clean for an hour, where the surface of the milk or the whey in the cheese vat constitutes the chief means of catching the nasty things, could they ever again see cheese without hearing the flies buzz?

All of these questions and many others are pertinent if we would investigate the foundation that supports the dairy industry.

The dairy industry needs adjusting in some respects! With very high prices during the past five years an appreciable portion of the cows were kept at a loss. Something wrong there.

While consumers were paying long prices for cheese and butter, we frequently deceived them in the quality of the goods. Something wrong there too. At times, because of the exceedingly high prices of butter and a high tariff thereof, millions of good citizens were compelled to go without it and use oleomargarine. Something wrong there and decidedly so, when the laboring man must give up the genuine and use the substitute food.

Wisconsin's dairy products are valued, in round numbers, at $80,000,000 annually. That is a staggering figure, yet this production should double a number of times at a rapid rate, provided the industry rests on a good foundation.

The responsibilities of our dairymen, it strikes me, is to produce more abundantly, so that dairy products will not be regarded as a luxury; to produce much more economically, so as to enable them to sell at prices within the reach of all good and useful citizens; and to produce, manufacture and handle their wares in a reasonably sanitary way, so that the consumer gets a square deal, for when the public has confidence in the integrity of the industry, good dairying will always pay.

Professor Humphrey, in charge of a large class of students from the County Agricultural School, here addressed the convention, and announced the Farmers' Course at the Winnebago County Agricultural School, to be held during the month, and urged the attendance of local farmers.

THE WISCONSIN DAIRY COW COMPETITION

PROFESSOR F. W. WOLL, MADISON

(Read by Professor R. T. Harris.)

It was my privilege last year about this time to speak before your association at West Salem on the subject assigned to me by your secretary for this meeting; the history of the Wisconsin Dairy Cow Competition was explained then and also the purpose we had in view in starting it, the manner of conducting the Competition, and the rules and regulations which were to govern the same. The Competition has now been continued for fifteen months and will be continued for nine months longer. It is, therefore, a progress report only that I have to bring before you this afternoon.

Entries in the Competition closed December 31st last year, with a total number of 506 cows entered. Of this number 448 were pure bred Guernsey, Holstein or Jersey cows or heifers,

and 58 were grades. The different breeds were represented as follows:—193 Guernseys, 211 Holsteins and 102 Jerseys. The total number of breeders who entered cows in the Competition are 56, of which 21 were breeders of Guernsey cattle, 22 were Holstein breeders and 13 Jersey breeders. According to the directory of the Wisconsin Live Stock Breeders' Association for 1909 there are 68 Guernsey breeders in the state, 152 Holstein breeders, and 57 Jersey breeders; that is, about 30% of the Guernsey breeders in the state entered cows in the Competition, 23% of the Jersey breeders, and 14% of the Holstein breeders. The three main dairy breeds found in our state were therefore, represented quite fully in the Competition and one important fact in connection with the breeders participating therein is that considerably more than one-half of the number of these breeders have never done any official or yearly testing before and were doubtless in the majority of cases lead to take up this work on account of the incentive offered by the Competition.

It will be noted that one class of breeders in this state is not represented among those taking part in the Competition, namely breeders of native or grade dairy cattle. This class of dairy farmers, as you all know, is by far the most numerous of our breeders of dairy cattle and is composed of the rank and file of the farmers who supply milk to our creameries, cheese factories and condenseries. In so far as the Competition aimed to include this class of dairy farmers it must, therefore, be put down as a failure. A few breeders of grade cows entered these in the Competition, but no herd composed of grade or native cows only is represented, and the condition of award of prizes announced for this class of herds only will have to be changed when the awards are made next November. The reasons for the fact that no farmers with only native or grade cows took up the work are several; first of all perhaps, the work involved in weighing the milk and keeping complete milk records of the cows, and second, a lack of appreciation of the necessity of informing one's self as to the production of the individual cows in the herd. The latter cause is the same as retards the progress of cow testing associations among our farmers. Where we have a bare dozen cow testing associations in our State, the Scandinavian and other North European countries, with no more

dairy cows than we have, and with much less money to devote to this work, have many hundred associations. Denmark thus had 530 cow testing associations in 1909, Sweden 662, Norway 126, Finland 92, and Germany 207. The difference in the number of these associations in existence here and in northern Europe is very likely due to various causes, but the main cause is doubtless that our farmers cannot see as clearly as their brethern in the old countries that money expended for the work of determining the production and the feed consumption of each individual cow in the herd will bring large returns and make a most profitable investment.

Since the hired help problem in this country is still more difficult than in Europe, this is another reason why our dairy farmers should welcome any co-operative effort that will enable them to pick out the cows which are yielding them no profit and are pulling down the average production and returns from their herds. For such cows are sure to be found in any herd where a systematic weeding out has not been going on for a series of years. In the case of the Dairy Cow Competition the incentive to win one or more of the seven different prizes worth from $10 to $150 each that could not be competed for by pure breds, in addition to the educational value of the testing of cows in the herd for their production were evidently not sufficient to induce owners of grade or native cows to take up this work.

One other factor than those already suggested may, however, have had somewhat of a deterrent effect, namely that the yields of exceptionally heavy producing cows published each month possibly discouraged some farmers from entering their cows, as they may have felt that these could not make a creditable showing in comparison with the high producers. This point no doubt had considerable weight with some farmers and was also duly considered by us; when we continued to publish from month to month the records of production made by the best cows, it was because we felt that it was only due to the breeders whose cows made good records in the Competition to let the world know about it and because of the advertising value of the records made, to the owners of the cows and to the pure bred interests of our state in general. During the past fifteen months abundant proof has come to us from many sources that the value of the Competition in this respect has already been

very great, so that what may have been lost in one way has, we believe, been more than gained in another.

As most of you may be aware, the main results of the Competition obtained to date have been published from month to month in the dairy press, and lists of cows producing or being credited with a production of more than 50 pounds of butterfat during each month have been given, which have enabled the farmers and breeders especially interested in the Competition to keep close track of the production of the best cows. Owing to the fact that the publishers of Hoard's Dairyman offered a special prize of $25 a month for the cow producing the largest amount of butterfat during the month, the record made each time, by what cow and breed, the amount of the production, the system of feeding followed, etc., have been watched with special interest every month by breeders in all parts of the Union. The prize-winning cows during the past fourteen months, with names of owners, and amount of production of butterfat are as follows, beginning with November, 1909, and ending December, 1910,—

Record Cows in the Wisconsin Dairy Cow Competition, Nov., 1909–Dec., 1910.

Month.	Name of Cow.	Breed.	Owner.	Production of Butter Fat Pounds.	
				Actual	Credit
Nov....	Mernalette 2d. 14731.....	Guernsey	C. L. Hill.....	80.772	80.772
Dec....	Leland Maid. 61312.....	Holstein..	T. Wright.....	79.297	79.297
Jan....	Daisy Queen Neth. 2d P. 109938.	Holstein..	J. Erickson.....	72.238	85.236
Feb....	Leland Sunbeam. 88664.....	Holstein..	T. Wright.....	68.398	78.658
Mar....	Jewel Star. 100978.....	Holstein..	E. M. Schultz....	67.682	87.987
Apr....	A. & G. DePreule DeKol 2d. 65482	Holstein..	Fred Pabst.....	80.367	80.367
May...	Cedar Lawn DeKol Joh., 113565.	Holstein..	C. A. Schroeder..	88.802	115.443
June ..	Dinah Joh. Abbekerk 2d. 64128..	Holstein..	B. F. Winckler..	83.523	83.523
July...	Johanna Pauline Paul. 95528....	Holstein..	H. F. Schroeder.	70.405	83.078
Aug...	Miss Narcisse. 220199.....	Jersey....	W. H. Clark.....	61.798	71.068
Sept...	Yu-No Aaggie Johanna, 86683..	Holstein..	G. J. Schuster....	63.450	66.623
Oct....	Caroline Paul Parthenia, 77784.	Holstein..	R. J. Schaefer...	92.373	92.373
Nov....	Queen Juliana Dirkje. 97608	Holstein..	J. Hetts.....	73.999	85.099
Dec....	Wisconsin Lass 2d, 101358*.....	Holstein..	J. Erickson.....	99.478	90.478

*Caroline Paul Parthenia, 77784 (record cow for Oct.) produced 93 lbs. butterfat.

These records are of a certain interest on account of the uniform and exceptionally large production of the cows, but they are only published incidentally, in connection with the award of the Hoard's Dairyman monthly prize; the primary object of

the Competition was not to find out what the cows can do in a month, but what their production for a year will be, under as nearly normal conditions as can be arranged, and all other prizes to be awarded in the Competition, aggregating over $4,000 in value, will be given for yearly records. Eighty-eight such records have already been completed at this time, and with each successive month a number of cows will finish their yearly records until the end of the Competition is reached, next November 1st, when we shall have somewhere between 400 and 500 complete yearly records of Wisconsin cows which will make the basis for the award of the prizes offered in the Competition.

The yearly records completed at this time are made by cows of the different breeds, as follows: 37 Guernseys, 28 Holsteins (2 of these grades), and 23 Jerseys (3 grades). It is not my purpose at this time to give and discuss the records made by these cows; suffice it to say, that they would do credit to any dairy herd and any dairy state. Six records are for a production of over 600 pounds of butterfat the highest being that of the Holstein cow, Leland Maid, 61312, the record cow for December, 1909. This cow produced 19084 pounds of milk, containing 2253 pounds of milk solids, and 649.7 pounds of butterfat, 13 of the records completed range between 500 and 600 pounds, 30 between 400 and 500, 32 between 300 and 400 pounds, and 7 only are below 300 pounds of butterfat. The average production of butterfat by breeds comes as follows:

Holstein cows 514.2 pounds per head, Guernseys 407.2 pounds, and Jerseys 350.6 pounds.

And the average figures for the entire 88 yearly records are: 9794 pounds of milk, 1305 pounds solids and 426.5 pounds butterfat. It should be remembered that these records were made by cows entered during the first months of the Competition and the cows were not, therefore, especially prepared for making large records, as is sometimes done. For this reason the records are doubtless lower than will be reached during the month to come, but they are good enough for a beginning. In nearly all cases the cows are bred again within five months from last calving and have regular breeding records, dropping two calves within 12 to 15 months, as the dairy farmer's cows must do if he is to continue in business. This is provided for by the rules of the Competition, and no prizes will be awarded

for records made by cows that were not safely bred within five months from the date of last calving.

The average production of butterfat for the 88 cows is equivalent to about 500 pounds commercial butter; valuing this at 30 cents a pound this production would be worth $150 per cow, a very creditable average income indeed, for such a large herd of animals. We cannot all have cows like these; the average dairy farmer has neither the necessary capital to buy such cows, nor—harsh as it may seem—the brains to properly handle and feed them if he could buy them, but we can probably all do better by the cows we do have,—feed them so as to bring them up to the largest economical production of which they are capable, prices of food and products both considered, and we are not doing our duty to those dependent on us if we stop short of that. The right system of feeding dairy cows under our special conditions in this state, is a subject by itself which I cannot go into now. I would only say, however, that a bulletin entitled "The Selection of Feeds for Dairy Cows" by Professor Humphrey and myself has just been published by our Station which covers this subject quite fully and I believe it will prove a very valuable bulletin to all who feed cows. Like other publications of our Station it can be had for the asking, by addressing the Experiment Station at Madison.

The feed records of the cows entered in the Competition are also at hand and will be compiled in due time; so far all we have been able to do is to keep abreast of the figures for production of milk, solids and butterfat as they are coming in from 300-odd cows from month to month. In view of the fact that we are still in the midst of the Competition and that we shall have a much larger material for study when all yearly records have been completed, it seems hardly worth while to take up more of your time now, but, your secretary willing, I shall be pleased to meet with you again next year, if able to do so, and will then try to draw such lessons from the completed Wisconsin Dairy Cow Competition as the results obtained may justify.

President Griswold: There was a premium offered to the man who made the best showing in the cow census taken in this vicinity. Mr. Goodrich will now announce the winner of that premium.

Mr. Goodrich: We want to know, first, what that prize is

to be given for,—the best herd, the herd that made the best record?

President Griswold: I understand it was to be the most profitable herd, the best net returns per cow, the average of the herd.

Mr. Goodrich: We have looked this over very carefully and several come very close to one another, but the best producing herd is No. 39 with 330 pounds of butterfat per cow. The cost of keep was $45.95; each dollar in feed produced 7.18 pounds of butterfat. Now, there are two or three others that come very close to this one; there is No. 31 with 305 pounds butterfat per cow, and the cost of keep is $43.05, which makes one dollar's worth of feed produce 7.08 pounds of butterfat, a little less than No. 39.

Mr. Aderhold: Explain the difference in the gross receipts.

Mr. Goodrich: The gross receipts for No. 31 are a great deal more than for No. 39, but you will find that that was owing to the skill of the man in manufacturing, or in marketing; he got over 40 cents a pound for his butterfat and that you cannot put to the credit of the cow, it was the man that did that. The other one received about 34 cents for butterfat, just about what would be obtained at the creamery.

Mr. Aderhold: No. 39 is John Hansen who lives on the Irish Road near the car tracks, and we have a nice premium for him.

CO-OPERATION.

Geo. F. Comings, Eau Claire, Wis.

"The spirit of co-operation is the master spirit of the age."
—Pinchot.

Mr. Chairman and Friends:—It is exceedingly embarrassing for me to attempt to talk to you along constructive lines and in such a way that you may think these questions over, and perhaps be led to leave the old beaten paths and move along new ones. It is much easier to tear down than it is to build up. Any one of you farmers can take a sharp axe and cut

down a giant tree of the forest that has been a century in developing, and destroy it in a few hours.

When I was a young man I read a story of Charles Reade called "Put Yourself In His Place," and I have thought oftentimes the dairyman makes a great mistake that he does not at times put himself in the consumer's position and try to look at some of these problems from the consumer's standpoint. Take, for instance, the tuberculin test. It may not always be correct, and yet in a great majority of cases it is; and I think farmers are standing in their own light in fighting it. As a consumer, you would want milk above suspicion for your children. Is it not your duty to be as interested in the life and welfare of your neighbor's child as you are in your own?

I was pleased this morning to hear a young man advocating the forty-acre farm, because as population increases, we shall have to get back to the small farm and intensive tillage. Another thing, as the country becomes more densely populated, we shall have to give up one after another of our so-called individual rights. I think it is high time we stopped talking about our rights and commence talking about our duties.

The farmer has been extremely individualized. The large holdings of land, his consequent isolation, and other conditions have fostered a spirit of independence. He is behind all other classes in having a true spirit of co-operation. At this time a great deal is being said about co-operation. This week in the state of Ohio at the National Corn Show, four different sessions are given over to the discussion of the subject of co-operation. Professor Bailey of Cornell, President Butterfield of Amherst College, and many leading economists, presidents of colleges and other prominent men take part. So you see we are not the only people talking about it.

I think it was President Cleveland who said, "It is a condition, not a theory, that confronts us;" and I want to speak of two or three of the conditions that confront us as citizens. The first condition I want to refer to is this, that for many years past there has been a declining population outside the cities. Iowa, the richest state in the Middle West, has for ten years faced this problem. In Ohio, in cities of 5,000 and upwards, is found one-half the population of that state. Outside of these cities the decline of population has been 30 per cent in

twenty years. If this continues for another twenty years, where will the farming interests of Ohio be? Where will be the country social life, the rural churches, the rural schools, and the interest in good roads? The declining rural population is one condition that I want you to think of as farmers and citizens.

Another condition is this, the unorganized condition of the farmers themselves. I want to use one or two homely illustrations to bring this point before you. You all know what an effective force you have in a mowing machine for doing a certain kind of work. It is an assembling of different parts fitting together harmoniously. But let its parts be scattered, a driving wheel here, a pinion there, the cutter bar somewhere else, and the forceful machine is useless. Farmers as a class, are the disassembled parts of a machine. While isolated, disunited they are weak and helpless. Organized and associated they become powerful and effective. So long as you remain unorganized, you represent your mowing machine with its parts scattered all over the farm.

Sir Horace Plunkett, the illustrious Irish statesman and writer, says: The weak spot in American farming is not so much in technical methods as in lack of business organization. The failure of farmers to combine in days when those engaged in every other commercial industry and calling combine, when farmers of every progressive country in Europe have recognized in combination the condition of economic survival, is due simply to the fact that farmers have not understood and no one has thoroughly explained to them the co-operative principle."

President Waters of the Agricultural College of Kansas says: "To-day the farmer is the only individual of large economic importance in the country who is not compactly organized for his own protection and progress. He buys and sells and conducts all of his business operations as an individual, without any regard whatever to his neighbor or his fellow farmer in any portion of the country. When he takes a load of hogs or a bushel of wheat to market, he must accept without recourse the prices for these wares, fixed by a compact of merchants or manufacturers. Co-operating, he might easily become independent of such organization, at the same time increasing his efficiency as a producer."

Hoard's Dairyman, discussing the oleomargarine bill pending in Congress, said: "Because of their unorganized condition the millions of farmers of this country have as little influence in the halls of legislation at Washington as a dish of ice cream would have on the temperature of hell."

A great deal has been said lambasting our rural schools and charging them as the cause of much of the unhappy condition of rural life. Much of this criticism is quife deserved, but we should keep in mind the dark past of ignorance and superstition from which we are emerging, and remember that as a class, farmers never yet have had a liberal education, they do not realize its power. They have never enjoyed the leisure that must be had to become educated and cultured. Farmers cannot become a cultured class until they are relieved from some of the economic burdens that bear upon them.

I think there are two words in the English language which mean more to the farmer than any other two words. They are the words "education" and "organization." By the word "education" I do not mean that which simply takes a boy or girl through the country school, then to the high school, from the high school to the university, perhaps to a profession, although that might be included in the word. I mean such a training, mentally, that he will understand not only the teachings of the books as they are taught in the public schools, but will understand all the great economic problems which must be understood by the farmer before he can break the shackles which bind him. So I say we must value more highly education. Our children are too often kept out of school because they can be made useful on the farm. They soon fall behind their classes, lose their interest and never catch up.

I have been criticised often times for talking to the farmers too much of idealism. I think farmers need more idealism; the lack of it is the reason the country-sides languish as they do, I wish you might all hear Mr. Bryan's or Jenkin Lloyd Jones' lecture on "The Value of an Ideal." Ideals have done far more for the world than its idols have.

I want to say I believe the old order is passing and a new and better is being fashioned day by day. An entire change of the industrial system to a co-operative one is the only one that seems to be in harmony with the teachings of the Christian

religion. Professor Richard T. Ely of our own University says:

"The principal reason to suppose that co-operation must ultimately succeed is that it alone brings about such a union of labor and capital as to prevent perpetual industrial warfare and warfare cannot forever be tolerated. It may be further said that it alone is compatible with the ultimate complete triumph of Christianity. Co-operation means brotherhood, a working for and with one another, not against one another. The principles of co-operation were formulated fifty years ago in England as follows: That human society is a brotherhood, not a collection of warring atoms; that true workers should be fellow-workers, not rivals; that a principle of justice not of selfishness should regulate exchanges."

I think theologians have made some great mistakes in interpreting the Bible. They have taught us to divide our life into two spheres—one we called sacred, going to church on Sunday, singing in the choir, shouting hallelujah, atending prayer meetings in the middle of the week; these are considered sacred duties, serving God. The rest of life is secular. I say the time is coming when all our activities must be considered sacred, when Monday, Tuesday, Wednesday, Thursday, Friday and Saturday will be the days in which we can serve God by serving our fellowmen, and you are not a Christian man in my opinion until you realize that the songs of labor are songs of praise as much as the songs you sing on the Sabbath Day.

Dr. Lyman Abbott has wrapped up pretty much all the teachings of the Christian Gospel in a nutshell by saying: "The only way you can serve God is by serving your fellowmen, and the only way you can wrong God is by wronging your fellowmen. And he meant service along these industrial and commercial lines. You do not serve God very much by on Sunday calling a man your brother, at Christmas time being kind and good, and on other days cheating and doing up every one you can. We must all come to realize that our lives are bound up in the lives of the community in which we live and that we must move along as that community moves along. That is the true idea of social evolution.

I want to speak to you briefly of social evolution. I will not dwell on the word "evolution." I know good men differ

in regard to the origin of the race. All agree, however, in regard to the social evolution. Our social organism began in very simple form and has been growing more and more complex. Two thousand years ago, under Roman despotism, there was production and distribution of wealth through a system of slavery. Later came the feudal system, and centuries later the competitive system, and now the co-operative. Each has been a step forward and upward for the race. Each succeeding step has seen more and more of the spirit of mutualism and of interdependence.

Mazzini, the Italian patriot, sixty-five years ago told his countrymen "That association is the coming great word." Pinchot has later said. "The co-operative spirit is the master spirit of the age—the farmer the last to respond to it."

Wallaces' Farmer advises that one of the first things to do is to form social clubs and get acquainted, learn how much of real goodness there is all about us. Every community has lots of latent talent, all that is needed is the magic wand of leadership, of organization to set these dormant forces to work. Adjoining schools can arrange speaking contests, adding and spelling-down tests, recitations, music, discussions. Schools should be made centers of social life. Verily there is a real hungering and thirsting for social life, for righteousness which is right relationship.

From social gatherings will evolve plans for co-operative business undertakings, creameries, laundries, testing associations, breeding associations, and stock shipping associations. I want to urge you not to look to these collective efforts so much for dollars gained or saved, but as a means of intellectual and spiritual growth. If we let the sharp-witted men of the cities make our butter, bake our bread, cure our bacon, market our crops, sell our stock and control our business relations, we simply fall farther and farther behind in our social and intellectual developments. We must educate, organize, and do things, or lose out.

In conclusion, I want to quote from the Bible of God's call to Abram: "Now the Lord said unto Abram, get thee out of thy country and from thy kindred and from thy father's house unto a land that I will show thee." So the Lord is just as truly speaking in visions to you, and to me, as he did to Abram

bidding us to break from the dead past and seek anew a better relationship. Will you, like Abram, be obedient to these heavenly visions that are calling you to be better farmers, better citizens, and to help build a new civilization so permeated with democracy, with love, with the golden rule, that it may live on and on, to bless, to make fruitful and beautiful the face of all the earth?

THE HISTORY OF DAIRYING IN WISCONSIN.

W. D. Hoard, Ft. Atkinson.

I am to say something to you on the history of dairying in Wisconsin. This history practically began in 1870 with the starting of a small paper at Lake Mills called the Jefferson County Union, which from its first issue, March 17th of that year, commenced to urge the farmers of Jefferson County to organize themselves into cheese factory districts.

The agricultural condition of the state at the time was distressing. Wheat was the only cash crop. It had been raised constantly without any regard on the part of the farmer to "a judgment to come." The soil of Jefferson county and other counties of like age, had been so impoverished that eight bushels per acre was the average crop.

Farmers everywhere were selling their farms for what they could get—fifteen to twenty dollars an acre—and emigrating to Iowa or Minnesota to ruin another state by like methods. There was no spirit or impulse abroad among the farmers toward reform of method, toward a study of the principles of soil fertilization. Animal farming consisted solely of the selling of a few haphazard, unregenerate cattle and hogs to the local butcher. There was no adequate organization of the meat industry for foreign export such as now exists. The enormous home consumption created by the Civil War had subsided and left the farmers stranded with a poor class of animals and low prices. Farming everywhere in the state was in a slump, a "Tooth and Nail" struggle for existence.

The total value of the dairy products of Wisconsin was only

about a million of dollars, with no export market at that, and the rates of freight so high to the Atlantic seaboard as to amount to a complete bar. It cost 2½ cents a pound to send cheese in ordinary freight cars to New York.

A few cheese factories were scattered here and there, one at Ladoga, Fond du Lac county, owned by Chester Hazen, one at Lake Mills, owned by Steven Favill, one at Fort Atkinson, owned by Daniel Holmes, one at Cold Spring, in the same county, owned by R. F. McCutcheon, another at Sheboygan Falls, with Hiram Smith as its inspiring genius. All told, there might have been a dozen of these factories in the state when in February, 1872, your speaker issued a call through the Milwaukee Press for a meeting at Watertown to organize a State Dairymen's Association. The Jefferson County Dairymen's Association and a similar organization in Fond du Lac county had been organized a year before.

Seven men met at the Linden hotel in Watertown to create what has since proved to be a most powerful organization in the upbuilding of Wisconsin agriculture, the Wisconsin Dairymen's Association. These men were Chester Hazen of Ladoga, H. F. Dousman of Dousman, A. D. Favill, Steven Favill, and W. D. Hoard of Lake Mills, Walter S. Green and Henry C. Drake of Milford, the last five all of Jefferson county.

Chester Hazen was chosen president, W. S. Green, treasurer and W. D. Hoard, secretary. The first regular meeting was held at Watertown in 1873, and every year since has this parent association held its annual meeting at various places in the state for promotion of sound dairy knowledge and enterprise. Its members have ever held high the standard of quality in dairy products. It has presented the rare exhibition on the part of its members of absolute self-abnegation to one supreme purpose of dairy advancement. No political schemes have been allowed to enter its ranks or divide its counsels. From its loins has sprung three other powerful organizations, The Wisconsin Cheesemakers' Association, The Wisconsin Creamery Buttermakers' Association, and The Southern Wisconsin Cheesemakers' Association, the latter devoted mainly to the making of Swiss cheese.

The utmost harmony between these organizations prevails, each working with state pride and loyalty for the establishment

and growth in the minds of Wisconsin farmers, cheese and butter makers, of advanced ideas in all branches of this mighty industry.

From the Wisconsin Dairymen's Association came the idea and impulse of the Farm Institutes in 1885, the upbuilding of the State College of Agriculture with its dairy school, the first in the country, the Short Course, the Farmers' Course and all that has played so grand a part in the proud achievement of our state in the march of agricultural development.

Today Wisconsin with only two-thirds of her territory under the hand of the farmer stands at the forefront among the states of the Union in the quantity and quality of her cheese, outranked by none in the quality and exceeded by only three states, New York, Pennsylvania and Iowa, in the quantity of butter produced. Three thousand cheese factories and creameries dot her territory like schoolhouses, centers of education, enterprise and enlightened production.

Over a million of cows respond twice a day to the empire building cry of "Co Boss." In that old Grecian fable of Cadmus and the Dragon's Teeth, we read that Cadmus consulted the oracle of Delphi when he would go in search of his lost sister Europa. The oracle told him to follow a cow wherever she went and where she found a place to graze and rest to there build a city. He obeyed the oracle, so legend says, and founded the ancient city of Thebes.

In like manner the farmers of Wisconsin have followed the cow. In the cut over lands of the far north she is converting the incoming blue grass pastures in summer into a rich revenue for the hardy settler, and the wonderful yield of clover and timothy gladden her heart in winter. Everywhere she goes there goes with her prosperity to every interest in society, the merchant, the mechanic, the railroad, and the professional classes as well as the farmer. The face of the country changes. Well kept farms, handsome houses and spacious barns, larger crops from fields enriched by her presence, cheese factories, creameries and condenseries are seen on every hand. At the railroad depots stand thousands of milk cans telling how the babies, as well as their elders, in towns and cities rise up and call her the blessed foster mother of our state and nation.

Banks and brokers build securely on the wealth she produces

which flows out to the factories as a "very present help in time of need." The dairy producing sections in the great financial panic of 1893 and 1907 met the flood of disaster with a smiling front and without a tremor. They knew it not except by hearsay.

Today the dairy products of Wisconsin amount annually to nearly sixty millions of dollars, besides the rapidly increasing revenue that is coming to our state from every state in the Union and the far off isles of the sea for our well bred dairy cattle. In the latter item the herds of Jefferson county alone furnish annually six hundred thousand dollars worth to outside buyers.

Wisconsin has become famous the world over for the enlightened laws she has enacted in support of the dairy industry and the sentiment in favor of the progressive methods she has fostered.

Permit me to say a word to the people of our towns and cities. The brief and imperfect review I have given of the history of our dairy industry should impress them seriously with the importance of protecting it against exploitation from all counterfeits and adulteration, through vigorous state and national laws.

The moral support of every citizen should be given to the effort to suppress the sale of foreign fat in the color and guise of butter. The cow is worth too much to every man, woman and child, as well to the future prosperity of the state to see her product supplanted by counterfeit imitation. Every mother in the animal kingdom that nourishes her young puts butterfat in her milk. It is the only raw fat designed in the economy of nature for the sustenance of old and young alike. We should be wise unto our salvation as relates to our families and our prosperity as a state, in upholding the integrity and advancement of this great dairy industry. The farmer is the bulwark of the nation. His intelligence, his prosperity, his enterprise is a basic force that supports and defends the lives of all the rest. Give your support then to every need that shall strengthen him in the discharge of his exalted duty.

He cannot sophisticate or counterfeit what he brings to you. Neither should you encourage selfish and dishonest capital in its effort to supplant his product with a fraud and counterfeit.

The prosperity of the city is bound up in the prosperity of the farm.

"No man liveth to himself alone."

SECRETARY'S REPORT, 1910.

To the President and Members of the Wisconsin Dairymen's Association: It becomes my privilege and honor to submit the following report of the expenditures concerning the period from adjournment of our Convention at West Salem, February 9, 10, and 11, 1910, to the present time.

H. C. Searles, Superintendent of Cow Testing Associations:		
Salary	$1,200 00	
Expenses	938 65	$2,138 65
Secretary:		
Salary	$250 00	
Office and traveling expenses	137 03	387 03
Southern Wisconsin Cheesemakers' and Dairymen's Association		285 00
Convention expenses, speakers, hotels, etc		485 58
Milk and Cream Premiums		60 00
N. West		160 45
Wm. Buss, tester	$40 00	
Julius Vretzschmar, tester	24 18	
John Clark, tester	42 80	106 98
Cornish, Curtis & Greene, supplies	$11 50	
Fargo Creamery Supply House	31 71	
W. D. Hoard Co., printing	99 40	172 61
Executive Board Meeting		18 18
Miscellaneous		23 82
Total		$3,838 30

A. J. GLOVER,
Secretary.

TREASURER'S REPORT, 1910.

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

Feb.	8.	Balance in hands of Treasurer	$320 19
"	8.	Memberships	202 00
March	3.	From state treasurer	1,000 00
July	5.	From state treasurer	1,000 00
"	26.	From A. J. Glover as per R. N. West	22 00
Nov.	29.	From state treasurer	1,000 00
1911			
Feb.	5.	From state treasurer	1,000 00

DISBURSEMENTS.

Feb.	25.	C. P. Goodrich, conv. expenses	6 58
"	25.	H. C. Everett, conv. expenses	12 00
"	25.	A. J. Buxton, conv. expenses and services	25 00
"	25.	H. C. Taylor, conv. expenses	10 60
"	25.	F. H. Scribner, conv. expenses	8 73
"	25.	Hugh Van Pelt, conv. expenses	15 02
"	25.	Joseph Newman, conv. expenses	17 25
"	25.	H. W. Griswold, attending Ex. B. meeting	32 84
Feb.	25.	Forest Henry, convention expenses and services	19 84
		J. Q. Emery, convention expenses and services	5 88
		C. P. Bull, convention expenses and services	8 45
		F. W. Woll, convention expenses and services	10 13
		A. J. Glover, convention expenses and services	12 33
		H. K. Loomis, Hotel and banquet tickets for speakers	57 00
		D. F. Miller, 1st prize on cream	10 00
		W. J. Dawson, prizes on milk and cream	12 00
		Adolph Nuttelson, prize on cream	6 00
		Theodore Gloeckle, prize on milk and cream	14 00
		W. T. Smith, prize on cream	2 00
		R. A. Atwood, prize on milk	8 00
		H. W. Griswold, prize on milk	6 00
		M. L. Welles, prize on milk	2 00
		J. P. Mason, convention expenses	16 50
		H. K. Loomis, postage	1 50
March	2.	H. K. Loomis, convention expenses	13 74
		W. J. Fraser, convention expenses	47 19
	9.	H. C. Searles, salary and expenses	166 54

April		O. Erf, expenses	$34 50
		Julius Ventzschmar, testing	24 18
		H. A. Cobb, rep. on tester	2 80
		Fargo Creamery Supply House	3 15
		Mrs. A. L. Kelly, reporter	132 00
		H. C. Searles, salary and expenses	173 27
		A. J. Glover, exp. attending oleomargarine hearing	73 97
		Fargo Creamery Supply Co	7 95
		W. D. Hoard Printing Co	48 80
		J. T. Westphal, ribbons	7 50
May		H. C. Searles, salary and expenses	173 13
June		H. C. Searles, salary and expenses	172 06
		Cornish, Curtis & Green supply house	1 30
		Wm. Buss, testing	40 00
		John Clark, testing	42 80
		Fargo Creamery Supply Co	15 25
July	8.	H. C. Searles, salary and expenses	167 42
		Cornish, Curtis & Green, supplies	1 52
	26.	R. N. West, bal. salary and expenses	160 45
Aug.	3.	H. C. Searles, salary and expenses	183 91
Sept.	17.	W. D. Hoard Printing Co	25 90
		Cornish, Curtis & Green, supplies	1 03
		H. C. Searles, salary and expenses	187 17
Oct.	6.	Cornish, Curtis & Green, supplies	2 2[illegible]
		H. C. Searles, salary and expenses	187 06
		Chas. Schenk, salary	140 00
Nov.	11.	Cornish, Curtis & Green, supplies	4 20
		H. C. Searles, salary and expenses	187 11
		A. F. Gafke, acid	4 92
		Chas. Schenk, salary	145 00
Dec.	11.	C. P. Goodrich	3 43
		G. W. Burchard, attending E. B. meeting	3 33
		H. D. Griswold, attending Ex. Board meeting	11 42
		Fargo Creamery Co., supplies	5 36
		W. D. Hoard Co., supplies	24 70
		H. C. Searles, salary and expenses	182 33
	1911		
Jan.	4.	H. C. Searles, salary and expenses	180 21
Feb.	11.	Cornish, Curtis & Green, supplies	31 20
		P. B. Haber Printing Co., sign printing outfit	6 00
		Mandel Engraving Co., halftone	1 10
		H. C. Searles, salary and expenses	178 44
		A. J. Glover, salary and office expenses	313 06
		Balance in hands of treasurer	705 89
			$4,544 19

H. K. LOOMIS,
Treasurer.

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