Thirty-third annual report of the Wisconsin Dairymen's Association : held and Wausau, Wis., February 8, 9 and 10, 1905. Report of the proceedings, annual address of the president, and interesting essa...

Wisconsin Dairymen's Association
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THIRTY-THIRD ANNUAL REPORT

OF THE

WISCONSIN

Dairymen's Association

HELD AT

Wausau, Wis., February 8, 9 and 10, 1905.

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

COMPILED BY

GEO. W. BURCHARD, Secretary.

MRS. A. L. KELLY, Stenographic Reporter.

MADISON
DEMOCRAT PRINTING CO., STATE PRINTER
1905

LETTER OF TRANSMITTAL.

WISCONSIN DAIRYMEN'S ASSOCIATION,
Secretary's Office,
FORT ATKINSON, May 20, 1905.

To His Excellency, ROBERT M. LAFOLLETTE,
Governor of the State of Wisconsin.

I have the honor to submit for publication, as provided by law, the thirty-third Annual Report of the Wisconsin Dairymen's Association showing the Receipts and Disbursements the past year, also papers relating to the dairy interests read and discussions had at the annual convention held at Wausau.

Very respectfully,

GEO. W. BURCHARD,
Secretary.

OFFICERS, 1904.

PRESIDENT,

CHARLES L. HILL,

ROSENDALE, FOND DU LAC COUNTY.

VICE PRESIDENTS.

HON. A. D. DELAND, SHEBOYGAN, SHEBOYGAN COUNTY,
President 1877.

HON. STEPHEN FAVILL, MADISON, DANE COUNTY,
President 1880.

HON. H. C. ADAMS, MADISON, DANE COUNTY,
President 1887-9.

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

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

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

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

HON. C. P. GOODRICH, FORT ATKINSON, WIS.,
President 1900-01.

HON. J. Q. EMERY, ALBION, WIS.,
President 1901-3.

SECRETARY,

G. W. BURCHARD,

FORT ATKINSON, JEFFERSON COUNTY.

TREASURER,

H. K. LOOMIS,

SHEBOYGAN FALLS, SHEBOYGAN COUNTY.

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

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

HON. H. F. DOUSMAN, WAUKESHA COUNTY,
President 1878.

HON. Z. G. SIMMONS, KENOSHA COUNTY,
President 1879.

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

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

ARTICLES OF ASSOCIATION.

(Adopted February 15, 1872.)

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 place 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.

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS

OF THE

Wisconsin Dairymen's Association

AT THEIR

THIRTY-THIRD ANNUAL CONVENTION

Held in Wausau, Wisconsin, February 8, 9, 10, 1905.

President Charles L. Hill in the chair.

The Chairman: The Association will please be in order. I hold in my hand practically all the property of the Wisconsin State Dairymen's Association. Three years ago at our meeting in Menomonie, among those particularly interested in the meeting was Senator Stout, whom you all know as having given to that town their manual training school, and the next year at Fond du Lac, through the courtesy of Senator Stout, there was sent from that school to the Wisconsin State Dairymen's Association this gavel, made by pupils of that school.

This opening meeting will be altogether informal, that we may become better acquainted.

ADDRESS OF WELCOME.

By Mayor E. C. Zimmerman.

Mr. President, and Ladies and Gentlemen of the Wisconsin Dairymen's Association: The city of Wausau is the center of one of the most populous and largest counties in the state. It is the seat of our county government, and by reason of its manufacturing establishments furnishes a ready market for the products of the farm. We therefore depend largely on our country folks and they depend on us. The city's progress is identical with that of the county, and it is more than a mere figure of speech, when I say that Wausau is the heart of Marathon county. Standing here as a representative of our beautiful, enterprising and pushing city, I feel that I have a right to welcome you gentlemen who are here to conduct the first convention of dairymen ever held in our midst, not only as I am bid, in behalf of the people of Wausau, but in a larger sense. I think I honestly voice the sentiment of the 4,000 honest and sturdy farmers of Marathon county, who have made it what it is, one of the richest agricultural districts in the state, when I, in their behalf, extend to you hearty greetings and welcome. I do so especially in their behalf, because you are here to speak on topics, interesting of course to all of us, but more particularly to them, and I have no doubt that they will soon learn the importance of these gatherings and the substantial benefit to be derived from them. We know that much of the progress made in the last fifty years in the mechanical arts, in engineering, in science and in all learned professions, is due to the association of men and minds, to the exchange of thoughts and ideas between men engaged in similar work. The men engaged in those professions, living in the thickly settled communities, in the larger cities, have long ago grasped the importance of frequent meeting for the purpose of enlarging their knowledge by discussing and exchanging their experience gained in many years of active life. So we have regular meetings of engineers, of architects, of machinists, of dentists and physicians, bankers, yes, of lawyers, which for some reason

they call "bar" meetings, and we have the many meetings of ministers of the gospel, where they advise as to the best method of making their congregations not only listen to, but also practice, the doctrines of Christ. It has been the farmer only who is neglected or who has neglected himself in this respect, partly because his field work did not allow him much time for mental speculation, partly because of necessity living apart, and cannot so readily meet as people living in the cities. The very fact that on that account he is much deprived of the opportunity of making other men's experience his own, is a sufficient reason that on some occasions at least, he should seek a chance given him for his mental and professional improvement. Farming nowadays is much different from what it was fifty years ago. Farming has become a science as well as manufacturing, and hard work alone will not always make a successful farmer, his work like any other must be guided by intelligence, which he can gain only by study; by studying the ground which he works, by studying the qualities of the stock, and the purpose for which it is raised, by studying the value of food for stock for different purposes, and the value of fertilizers which he uses or may use with advantage, and last but not least a study of the markets where he must sell.

The invention of labor saving machinery gives him now more chance for reading and learning, but nothing is more admirably adapted for mental improvement than public lectures. A farmer who listens to an interesting lecture and, as one would say, takes the words from the speaker's lips, is much more apt to retain them in memory than if he should read them in print. It is not to be overlooked that farming is still the greatest industry of our country; that the value of farm products exceeds by far the value of the products of any other industry, if it does not exceed the total value of them all. The dairy products are today one of the most if not the most important source of income of a very large percentage of the American farmers, and upon the intelligent conduct of that branch of agriculture depends in a measure his success. To make the farmer familiar with the best methods of conducting the dairy business and succeeding in it, to instruct him how to secure the annual output and at the same time increase its value per pound, is the object and purpose of this convention and we extend to you,

gentlemen of this convention, our most hearty welcome. I hope you will pardon me if I have inadvertently said, convention. I did not mean anything wrong. I know that conventions have become discredited in late years, but we like your convention nevertheless, because it will be so excellently managed, I should have said conducted, and because we know it will run so smoothly. Our farmers, and every farmer is a dairyman, and every dairyman is a farmer, will be glad to learn from you the difference in the milk of the different breeds of cows, which animal is best adapted for butter, which for cheese and which for beef, or which for all purposes combined, if a difference exists in that respect. I heard an old farmer frau once say that she liked her cows because, she said, "they give me back everything I give them." She was a thoughtful woman and there may be meaning in this homely phrase that needs explanation. I know that our dairymen will be more than pleased to listen to you gentlemen, especially to a practical gentleman of their own number, whose cow has given her own weight in butter in one year, and who has succeeded in coaxing an unwilling congress to protect the gentle American cow from the machinations of the beef trust.

Gentlemen, I assure you that of the many conventions which have been held here, and they were of all sorts, there has been none which we welcome with a greater degree of pleasure than yours, the convention of the Wisconsin Dairymen.

RESPONSE.

President Hill: Mayor Zimmerman, kind friends of Wausau and Marathon county: It is very unusual for the President to be asked to respond to the address of welcome, and why the Secretary arranged it I do not know. Perhaps he thought I would feel more than others, who had not come so far, the welcome of this Association. I was up here in the fall to make some preliminary plans for this convention, and I not only had the assurance in words but in actions, that the members of our

convention would be most welcome indeed. So I realize that the welcome given by Mayor Zimmerman is not of the city alone, but, as he says, of four thousand farmers of this, Marathon, county.

When we first talked of having this convention, several places were suggested, and I said that I honestly believed that Marathon county has in it greater possibilities as an agricultural county than any county in the state. I think that we who have come here, when we examine those samples of soil that are down in the exhibit room, taken from different portions of the county, will realize why you have such wonderful possibilities. Some of the counties farther south in this state, and perhaps even farther north and west, have a large proportion of their territory taken up by stony or sandy land or land with gravelly subsoil, but you in Marathon county, as I understand, have nearly every foot of your land good land, except this small Wisconsin river valley. It has been my privilege to drive through different sections of Marathon county, and while I may not realize its possibilities as you do here, I am sure that even you do not yet realize what is in store for this county.

This Wisconsin State Dairymen's Association comes to you today not as teachers, but as learners. We have come here to talk over in your presence and with you these topics which are of so much inportance to us all. Marathon county is known throughout the state in many different directions, one of them being the new Marathon County Agricultural School. We are very glad to be able to receive the welcome of the schools and to see some of the students taking part in this opening session.

It was my privilege to look over the plant of the Marathon County Dairy Company last fall, and it is a model plant in which I am sure you take great pride. I was glad to see that the milk received at that plant shows a very high order of dairy farming in this part of the country.

The Marathon County Agricultural Fair is one of the few that are noted throughout the length and breadth of this state, and further, as an agricultural fair, a fair that should be of the greatest benefit to the farmers and bring the farmers and the city people together, for as Mayor Zimmerman has said, the city people depend upon the farmers.

I realize that you people call this country the "Clover Belt," and aptly so, and we who come from considerable distances are glad that we are going to hear at this convention all about the possibilities of this country, and particularly with reference to the clover culture.

There is another thing that is going on at this time in this county that is interesting, and that is the continuous test of a pure bred cow that has already made a better record on twenty-five cent butter than any other cow in America, and promises still greater things. I think you can almost surely say that Marathon county is going to hold the world's record as a butter test, and you know who owns that cow, Mr. Frederick Reitbrock of Athens.

On behalf of this Association, I thank you good people for this kindly and hearty welcome. We feel that you have not only spoken it, but that you feel it toward us, and I hope that in the sessions of the convention that will follow you are going to feel just as free to take part as the speakers who have come from abroad. This is your convention and you have as great a right to a voice in it as any one else. Let us learn from one another while we are here so that we may all go away benefited for having been here. Personally, I never attended a meeting of this Dairymen's Association without going home feeling a greater consideration for the work on the farm, feeling a strong desire to do better work, to excel my past year's work, and I hope we shall all go away from this convention feeling this way. Again, I thank you.

GENERAL GREETINGS.

C. H. Everett, Racine.

Mr. President, Gentlemen of Marathon County: It certainly gives me great pleasure to be here this morning and to note the prosperity of Marathon county, to note its increase in prosperity since my last visit to the county seven or eight years ago.

While I am not now actually engaged in farming work, I am nevertheless watchful as ever of all agricultural interests in the state, and I know fairly well what is going on in this county among you farmers. I know of your soil, your good climate, your good water, your good grasses, etc. I know that your county is well adapted to dairying, especially to cheesemaking and butter making, and I know also that you have many good farmers and that you have good cows. I know further that some of you farmers seem to lack in "know-how"—that is a good way to put it. They have cultivated the soil well, perhaps a little better than the mind; what we are here for today is to cultivate the mind. It is an easy thing to plow, to harrow, to sow and to reap, but we must know why we do these things. It is an easy thing to feed a cow, but it is not quite so easy to know what she pays back for the feed that we give her. We are too apt to feed a lot of oats and corn and hay and bran to a lot of cows and take what they give back in return, to take the check from the creamery, grumble a little perhaps at the price of butter fat and perhaps more liable to try to remedy the price than to apply the remedy to the other end of the business, that is, get a cow that will return more for the feed. Now, if farmers had to feed money to cows instead of corn and oats, they would be more particular as to what they got back, and yet there isn't a particle of difference. You take a bushel of corn and a bushel of oats and fifty cents worth of hay, say, $1.50 worth of feed, and place it here on this end of the table, and $1.50 in money over there, is there any difference? The feed will buy $1.50 and the $1.50 will buy the feed. They are of equal value, no matter whether you raise them or procure them in the markets of the world. Now, isn't it the business of a clear-headed, shrewd, wide-awake dairyman to know what he is getting for that $1.50 in money that he feeds his cows? That is the proposition that is up to every Marathon county dairyman, as well as every other dairyman, it is a business proposition.

We have all kinds of cows, as well as all kinds of men. We are apt to speak of a dairy cow as a machine into which we put a certain amount of feed, and we know that we can not get milk from her without first putting feed into her mouth. What kind of dairy machines have you got in this county, and are you sure that they are returning to you $1 for every dollar's worth

of feed that you give them, or 90 cents for every dollar's worth, or $1.25 for every dollar's worth? That is a proposition for you to decide, for you to study out for your own good.

Life is short; we do not live a great while any of us, we do not own any of the land that we occupy. We are simply tenants for life; we ought not to be narrow and starve out, get all that we can personally out of the land, out of the farm, and let those who follow take care of themselves. It seems to me that we ought to try to be broad and intelligent, and cultivate the land, do what we can for ourselves and at the same time look into the future, leave the land in as good condition at least as we found it, and intelligent dairying will do that on any good soil. We ought to be liberal, broad-minded business men. I want you to study the questions that will come before you at this convention. Every skillful dairyman has to study these questions. I have been in the dairy business for a good many years and had to study out these things for myself, and I got a good deal of help from meetings of this kind, and still when I went back home to the farm it was myself who had to apply the lessons that I had learned elsewhere, so far as they were applicable to my condition, and such will be the case with you. This is your meeting, it is not ours. I hope you will make the most of the opportunity. We shall be glad to help you all we can, to exchange ideas with you and give you practical suggestions and lessons in return for your experience. I thank you.

Hon. W. C. Silverthorn of Wausau.—Mr. President and Gentlemen: When your Mr. Wright asked for the use of this court room, he seemed to have some hesitancy whether we would give up the use of the court in this room for the convention, and yet I do not know why he should hesitate, because perhaps he is aware, that although I had been a great agriculturist, I had been upon the bench so long, he perhaps feared I had lost some appreciation for agricultural pursuits. But I assure you that it is with great pleasure and with considerable pride that I feel

now that I could not have done better, or devoted this room to a better purpose. I see that in the manifestation you have already given of the purposes for which you have convened, and I welcome you most cordially and concur in the sentiment expressed by Mayor Zimmerman and second that welcome, not only here in this room but to the city and to the county, so far as I am able to do so as a citizen and an official.

I was raised in Wisconsin, although born in Canada. I spent my boyhood days in Jefferson county, and finally adopted my local habitation and home in Marathon county, and have been here nearly two score years, and it is with great pleasure and satisfaction that I hear this county and this locality spoken in such terms of praise, and, I think, just appreciation. I wonder how the great transformation has come about that the pursuit of agriculture has come to rank so high as it does today, not only here, but throughout the American continent. A farmer does not now seek, as he did when I was a boy, to hire so many hands. Why the use of the word "hands?" We would sooner say "men." We want so many men, although we appreciate hands perhaps as much as ever, but we have the machinery today that does much of the hard work; but no machinery can do the work of the head, and so the people of the country have come to realize that they must cultivate the head, and for that reason they start out young men in the pursuit, not only of cultivating their own heads, but assisting in cultivating the heads of others, establishing agricultural knowledge and diffusing it throughout the land. Not only here, but elsewhere, the pursuit of farming has grown to be the first, as it is the most numerous. Over in Canada, a few years ago, I picked up one of the papers, after listening to the remarks of quite a number of people gathered together at a sort of a fair, and in that paper I found a little poem that I cut out and pasted it into my memorandum book, and for want of saying something better or nearly as good, I will read you that bit that I cut out, which voices the sentiment expressed here. This is entitled "The Farmer".

"THE FARMER."

"The king may rule o'er land and sea;
The lord may live right royally;
The soldier ride in pomp and pride;
The sailor roam o'er ocean wide,
But this, or that, whate'er befall,
The Farmer, he must feed them all.

"The writer thinks, the poet sings,
The craftsmen fashion wondrous things.
The doctor heals, the lawyer pleads,
The miner follows precious leads,
But this, or that, whate'er befall,
The Farmer, he must feed them all.

"The merchant, he may buy and sell;
The teacher do his duty well;
But men may toil thro' busy days,
Or men may stroll the pleasant ways,—
From king to beggar, whate'er befall,
The Farmer, he must feed them all.

"The farmer's trade is one of worth,
He's partner with the sky and earth,
He's partner with the sun and rain,
And no man loses for his gain,
And men may rise and men may fall,
But the Farmer, he must feed them all.

"The farmer dares his mind to speak,
He has no gift nor place to seek,
To no man living need he bow;
The man who walks behind the plow
Is his own master, whate'er befall,
And king or beggar, he feeds us all."

The sentiment, I am sure, is the sentiment that appeals to every man here. I have noted it in your countenances, I have

noted it in the sentiments that have been expressed, and I repeat again that you are not only welcome, but you have made us all feel proud to receive you here in our midst. I wish you many, many years of prosperity and health, and that you will return again to our midst.

W. D. Hoard, Ft. Atkinson: Mr. President: An old Indian once said to me, "White man heap talk. Indian heap think." The winter time is the talking period in agriculture. We work all summer and think and study and plan, and then in the winter we come together and gossip over it, and Tom says to Bill, and Dick says to Harry, and John says to Sam, "How did you do it?"

There is a great deal of importance in the character of the meetings that this Wisconsin Dairymen's Association has been having for thirty-three years. This is the thirty-third convention; and I want to say, I never in all those years—and I have attended every meeting but one—I never saw as cheery a spectacle before me at the opening of any convention as I see here in the faces of these boys. I never saw a lot of boys come together at our opening meeting before. Verily, we have fallen upon an awakening period in the mentality of the farmers of Wisconsin, when boys will come out and enjoy a meeting like this. I know what it is due to; that you have organized yourselves in Marathon county, and I know that the whole state is suffering for lack of this county organization.

Men are like grains of sand, they are like a rope of sand. All there is to that which we call civilization today as against barbarism, all there is of the superiority of the white man over the Indian, who once was the sole ruler of this country, all the difference lies in that one word, "organization;" all the difference there is, all the superiority in civilization over barbarism, is in the co-operation of men together. The white man co-operates; the white man works together; the white man organizes; organizes in the form of government, into township and county and state, going down to the last unit in school districts. The Indian never organized, but the Indian sat still and thought and didn't do anything more than think.

Now, you have done a great thing in Marathon county, and I want to say here that nothing has ever occurred in the history of my state that gave me more cheer—I am on the down hill side of life, I do not expect to be cheered a great many more years—nothing has ever given me more comfort and cheer than the fact that Marathon county and Dunn county organized in their midst a center, like the building of a fire, and that fire shall warm and cheer and invigorate the thought of the whole county in the way of intelligent teaching of principles that apply to the well being of this and every other community.

Men take a cheap view of agriculture and a cheap view of farming. Farmers, more than any other set of men on earth, have cheap fixed ideas concerning themselves. Go out here on any farm almost in this county—a few weeks ago I was up here talking to a body of farmers, and I was impressed that the farmer takes a narrow, cheap view of himself. He doesn't think he is much of man unless you tell him he isn't, then he gets mad and thinks he is; but he doesn't think he is very much of a man, and he doesn't think much of his business and he doesn't think much of his place in society. He is mistaken. The old Persian courtier said to his king, when the king was about to bestow a great honor upon him, the king said, "What shall be the measure of the honor I shall give to you?" And the courtier said to him, "Honor me as I honor thee."

Now, to every farmer living out here on his farm and confronted with these hard problems and doing his work and thinking that the world does not pay any attention to him, yet in every single farm home in this state is the problem of law, the great problem of mastership of mind over matter, the mastership of the head over the hand, of the head over the problem of the farm, and so—you have in Marathon county established this school. Why? That these boys may start a little better, with a little more advantage in knowledge and understanding. Judge Silverthorn has spoken of Canada. I have lectured in all the provinces from Manitoba to the Atlantic ocean. I have been wonderfully impressed with the work that is going on in Canada. There is one man in Canada that is doing a marvelous piece of work, Sir William Macdonald of Toronto. He has devoted a fortune of nearly $3,000,000 to the education of the boys of Canada, and he has put that money into the hands

of my friend, Prof. Robertson, and now he is educating in manual training over 8,000 boys like these boys I see before me. I spent a month with Prof. Robertson, going from one manual training school to another and seeing what was being done with those boys in leading them up so they can see a little further. A man down at the bottom of a well can only see a small circle of the sky above him. Lift him out of the well, and he sees a little further. Put him on top of a hill and he sees still further. That is the reason for education and thought and study—it don't make you any more of a man than your mother made you, and no living man on earth, nor any school or anybody else, can make you any bigger than your mother made you. But what does it do? It simply takes you and gives you a little higher stand so that you can see further, a wider horizon, and so there is no such thing as higher education.

We have fallen into a foolish habit of talking about higher education. There is no such thing; there is a wider education, when a man gets where he can see a little further; that is all. The altitude where you stand is the important thing, not what you get. What you get is width; you see more; you think more; you study more, you believe more, and you have more faith and you do more.

Old Judge Conger was a queer old fellow, and he told me one time, in talking to me of the difference between the way men face their work, that some men were opposed to more things than they were in favor of. Now, think of that, boys; just think of that; some men are opposed to more things than they are in favor of. You never saw that kind of a man ever do anything. But the man who is in favor of more than he is opposed to, is the man that reaches out and does something all the while.

Now, Sir William Macdonald is reaching out to take hold of the country school districts of Canada, and by the help of the government he is going to put his money into it. He is going to organize all the country school districts into groups of ten, and every school district is going to take a half an acre of land and attach it to the school house, and the school district is going to manure that land and plow it and harrow it and put it into condition every spring, and then Sir William Macdonald is going to send a teacher and that teacher

is going to that little country district school to spend half a day in each week and each teacher has ten of those schools, each boy has got a plot of ground and each boy is going to learn how plants grow; how corn grows; how oats grow; how timothy grows and how other stuff grows. He is going to study physiology and biology, plant life as it attaches to the farm. Now think of it, Mr. Goodrich and Gen. Burchard and President Hill and myself, and every other old fellow here, think what a big lift that is going to be on the future history of that boy; how he is going to come to the farm when he has had a chance to know what it means, how plants grow. I came up as a farm boy and all the chance I had was to try to make things grow without undertaking to know anything about how they grew, and all these old farmers have come up in this way, and the state never has done anything in God's world for the farm schools out in the country. It has never done anything to help the farm boy know anything about these things, but it has spent money galore in making doctors and lawyers and members of all the professions, while it has let the farm boys grow up with all these great problems before him and never paid a dollar to the country school, and that is the farmer's school.

Today we are just on the verge of an awakening of thought and judgment and conscience, a sense of justice in the people, and we must do something in this matter, we can't help ourselves, because the conviction is pushing the state right along.

See what Canada is doing! Now, Canada doesn't pay any attention to the old farmer. They have to quit pretty soon, and besides that you can't teach an old man much, I know that. It makes me think of a story I heard down in Illinois. An old farmer had a horse and the horse was very sick, and the boys were fussing with it and the old farmer looked at the horse and by and by the old farmer said, "Boys, 'tain't no use to give him physic, his eyes is sot." That is the case with us old fellows—our eyes are "sot," and it ain't much use to bother with us. But the farmer that is to be, the farmer that is coming like these boys here, the future of our state, its ability, its capacity its growth, its understanding, and more than all things else, the saving of the fertility of our soil, that must come by the educa-

tion and culture and understanding of the young man that is going to be the future farmer.

Oh, I could tell you stories of the destruction of American farming. I have studied it from the Atlantic coast to the Rocky Mountains. I have seen going straight along that every step the American farmer has taken from the Atlantic coast to the Rocky Mountains, has been a destruction of two great things, and those are forests and fertility. Do you know what that means? It means that the state of Indiana today is poorer by fifteen dollars an acre on her land than she was thirty years ago. It means that the state of Ohio is poorer by twenty dollars an acre than she was thirty years ago. It means the state of New York has lost in thirty years fifteen hundred millions of dollars by the decline of the value of her farm lands. Now, don't you see what education means? The saving of the state, and I tell you that education means not only that you shall put a little more money in your pocket, but it means you shall save the productive fertility and the productive power and the productive strength of the state. These things are practical, they are not chimerical, they are not visionary, there are not theory, but they appeal to the very foundations of our society, and you in Marathon county, have builded wiser than you knew.

I wish I had the whole county before me today that I could say to them what I believe concerning what you have done here. You have not only done something for your own pride and that of the future farmers of your country, but you have established an example. We have tried to get a school like this in Jefferson county and our farmers have shut their eyes and they have been penny wise and pound foolish and they have been questioning about taxes and all that, and they have refused to have such a school. But it is coming, we are going to keep after them until we establish this foundation as you have done in Marathon county. I congratulate you on what you have done.

Twenty-five years ago I came into this county at the solicitation of Mr. J. M. Smith. He wanted me to advertise some of the land of this county, and I didn't want to do it until I knew myself whether I was misleading my readers or not. So I came in here and spent a week traveling over this county, and out in the town of Stettin I looked at the soil and I made up my mind that Marathon county was, as far as I could see it,

a county of splendid answer to the hope and labor of the farmer, and I went home and said what I could to our people, "If you want a change, if you want to better your condition, if you want to do something for yourselves in a different way, do not go to Dakota, do not go off to the west, keep in our own state, go up in Marathon county and Clark and these other counties."

Now, then, these things have come and the things today you might call fruit of the very blossoms I saw twenty-five years ago.

These things interest me much. I have loved my state; I have given to it the best of my life, and I hope to give it more, but I love to see the thing grow. I am a good deal as the boy was when he put twenty-four eggs under the old hen and his mother said, "Why, Tommy, why do you put so many eggs under the old hen?" "Mother," he says, "I like to see the old thing spread herself."

The Chairman: I am sure that I read in all of your faces, and especially those of these boys, an appreciation of these views expressed by our ex-Governor Hoard. He says that twenty-five years ago he came into this county to look up its agricultural possibilities. Some few years previous to that, I think a matter of twenty-eight years ago, when but very few were even beginning to think of Marathon as an agricultural county and the one product that Marathon county people were talking about then was logs, always logs. But not every man was blind to its possibilities as a farming country, and twenty-eight years ago last summer there came here a man who had become interested in lands here and walked many miles, I don't know how many, forty or fifty or sixty perhaps, through the woods with the one idea in mind of looking up the future possibilities of this country along agricultural lines. You know something of the impressions made at that time upon that man's mind and of the work he has done since, and we would like to hear from Mr. Fred Rietbrock for a few moments.

Mr. Rietbrock: Mr. President and Gentlemen, what the president has told you is true about my coming here and stay-

ing during the five growing months of the year to see how things would grow. The secret of my coming was to see whether the country was good for anything for people to go into who had a precarious existence in the city. It was following the hard times of 1873, the people through the country and particularly in the cities were practically "busted." Many men were working for sixty cents a day and only four days in the week, to keep hundreds and hundreds of families. In the country many of the people have no idea, are very little informed in regard to how things are in the cities, and yet many of them have a strong inclination to get some kind of a job in the city. Many of our boys want to get on the railroad. They know that S. S. Merrill and a few others have worked themselves up perhaps from brakeman to the position of general manager or president of a great railroad system. They don't stop to think that that great railroad system having perhaps tens of thousands of miles of railroad and handling millions of money can only have one president and that he generally holds on for a long time, and there isn't much chance for a boy to get that place; but still our boys have a secret inclination in that direction, and how splendid it is to be a brakeman, standing up on top of a freight car running at the rate of thirty miles an hour, with his coat-tails sticking out behind, hanging on to a wheel on a cold morning, with the thermometer twenty-five degrees below zero, with a remote prospect of being a president, while we as agriculturists, —I was a farmer when I was on earth the first time, then I got off for thirty or forty years, didn't pay very much attention to actual farming, but I am after it now on my second heat. But of one thing I am more powerfully convinced than everything else, and that is in looking over the whole field of human endeavor, that the farmer holds the middle position. The opportunity is not great for the farmer to increase his wealth up into the millions, but there are many farmers who have in the period of their activity worked up to a hundred thousand dollars and there are but few but what have made a fine living as they went along. Beyond everything else, it is the place of independence. It is the place where want does not creep in if the farmer works with some degree of diligence and some little intelligence. While you do not find millionaires among the farmers, you do not find that abject poverty and great want and scratching

around to get bread to keep life in the body that you find in the large cities. And yet, strange to say, many of those men that you see suffering in the cities came from the farm. It has been said, and I suppose truly, as an observation of the wise men, that the fourth generation from the men of brain and muscle who come from the farm to the cities, runs out into nothingness. If the young men will only think of these things, catch hold of the idea, I think they will make up their minds that after all the farm is a good place for them, because it is there they can put themselves beyond want, but there they will find a comfortable subsistence, a comfortable condition of independence, far more so than in the city, and I say that although I was not an absolute failure myself in the city. Indeed, I worked up a very good income from my profession, though that profession was that of getting other people out of trouble, and perhaps some in. I was simply a hired man for other people all the time. I had nothing of independence, no scheme that I could work out in my life time and I didn't like it as I like farming. It was not a hard job for me to jump out into the country. In those days I used to run out of the city two days of the week and that gave me an opportunity of running through Marathon county. I had heard that there was lots of sand up there, but there were patches of good land and I wanted to see what it was, and that is how I came to come here, and I must say I have taken great pleasure in that part of my life in coming here. I know that the people of Wausau and a good many people of Marathon county seem to be quite friendly to me, and we haven't gone back on each other very much. I have been in nearly every northern county of this state and I didn't find anywhere else such a tremendous stretch of territory as exists here, extending to the east and the west, of good land, and the land is what we have to have when we start farming. The time was when Uncle Sam had a farm for all his sons, but he hasn't it now. The last patch he had was the Rosebud reservation, which he acquired from the Indians and put it on the market, twenty-six thousand quarter sections, and 125,000 filed claims for that land. Uncle Sam has squandered his land in a short lifetime. I heard a man talk just a few weeks ago who has charge of a farm of 300,000 acres in Texas, and there are many farmers in the west having 10,000, 20,000

acres, but the time is coming when they will all be cut up into farms of convenient size. Uncle Sam's big domain is scattered and people are coming to realize it. It is the farming communities that sustain the government and feed the people.

Now, I believe that the Dairymen's Association will have a good meeting here, and I hope that those who come from the southern part of this state will be interested in the style of people we have here. Some of our people understand rolling logs better than they do farming, but their boys will learn the other trade and make good farmers. I thank you, gentlemen.

The Chairman: We regret very much that our Treasurer, Mr. Loomis, who has served so many years, will not be with us on account of the illness of his wife. In his absence, I will appoint Mr. Rietbrock as Assistant Treasurer.

Adjourned to 1:30 P. M.

AFTERNOON SESSION.

The convention met at 1:30 P. M.

The meeting opened by the President and Mr. C. P. Goodrich called to the chair.

PRESIDENT'S ANNUAL ADDRESS.

In opening this the thirty-third annual meeting of the Wisconsin State Dairymen's Association, it is with a realization that a third of a century has passed since its organization at Watertown in 1872.

Of the pioneers who founded it, only Gov. Hoard, H. C. Drake and Uncle Stephen Favill remain with us. We younger men realize more fully each year, how far sighted was their work, and they builded even better than they knew.

The influence of these men increases as the years pass on, and

none of us yet realize what is before the dairy industry of Wisconsin.

This was the pioneer organization of its kind in the west, and is recognized as the leader of such associations all over the country.

Largely as a result of the work of this Association, Wisconsin stands second as a dairy state, of all the states in the union, and but a short time will elapse before it is far in the lead of all others.

The Farmers' Institutes of the state were also an outgrowth of its work, and the dairy school at Madison calls this Association its alma mater.

I commenced to attend the meetings of this Association in 1888, and have missed but two since that time, and any success that may ever come to me as a dairyman, I can truly say will be due to the influence of the older members of this Association and to their kindly consideration, and unselfish use of knowledge, born of experience.

In assuming the duties of President at this time, I only do so because I realize that younger men must take up the work that these pioneers are laying down, and we must learn to unselfishly work for the welfare of others, as cheerfully as they have done.

Another thing that tends to show the advanced dairy thought of the state as fostered by this Association, is the fact that in the work of official testing of the different breeds of pure bred dairy cattle, the breeders of this state have been in the front rank, not only in the number of cows tested, and in the size of the records, but also in working for revisions of the rules that will call for tests of more value to the dairy public.

Some years ago a certain live stock journal took occasion to sneer at the fact, styled by it, "The Wisconsin Idea," that in this state, more than any other, the farmers were beginning to realize that the cows to be good producers in the dairy, must be dairy, and not beef cows, and bulls to sire such cows must also be of strictly dairy temperament.

Results of the winnings of Wisconsin cattle in prominent dairy shows, and tests since that time have vindicated our position, and silenced all critics.

The results of the cheese exhibit at St. Louis prove that by the more than thirty years of constant effort directed and led by this

Association, Wisconsin now leads the world in the quality of her cheese, and we must so value, and strive to increase this reputation that it will be impossible for any competitor to overtake us.

At the same time the reputation won by Wisconsin butter at St. Louis was not nearly so enviable, but with the system of inspection of which I shall speak a little later on we can reasonably expect to make great strides forward in this direction.

In 1850 New York had 931,324 cows, while Wisconsin at that time had but 64,339; in 1900 New York had 1,501,608 and Wisconsin's number had grown to 998,397, or practically two-thirds as many as New York, and at the present rate of increase, in the two states, Wisconsin will soon be in the lead.

In 1870 New York had 308 cows per thousand of population, in 1880, 283, in 1890, 240, and in 1900, but 207, showing a constant decrease.

Wisconsin had in 1870, 292 cows per 1,000 population; in 1880, 364; in 1890, 470; while in 1900 we had 483.

Only the two states of Vermont and Iowa excel us in this respect, and in the ten years from 1890 to 1900, Iowa lost 146 cows per 1,000 population.

While according to the census of 1900 Wisconsin stood third in the list of states in the total value of dairy products sold from the farm, standing a good ways below New York, and slightly below Pennsylvania in this respect, still the much lower prices of feed prevailing here would make the net return look like quite another matter.

Wisconsin's nearness to the feed bins of Minnesota and the Dakotas, and her ability to raise cheap forage crops guarantees an ever increasing dairy industry, combined with high net profit.

As I remarked in the response to the address of welcome, few of the farmers of the United States, or even those of southern Wisconsin, begin to realize the dairy possibilities of northern Wisconsin.

This is indeed the "Clover Belt," not excelled, or even equalled in this respect, by any territory of equal extent in the union.

Corn for silage is successfully grown even in the extreme

northern part of the state, and a large per cent of the land well adapted to dairying is still in an uncultivated state.

The mining and lumbering towns of northern Wisconsin and the upper peninsula of Michigan afford from year to year an ever increasing market for all that we have to offer in the line of choice dairy products, especially milk and cream for daily consumption, and the demand will increase faster than the supply if we only give them good goods.

St. Paul and Minneapolis derive, and will continue to do so, a considerable portion of their dairy products from Wisconsin.

With the low price of these lands, and their high quality, in no other place in the union is there so good an opening for the beginner in dairying, or the expert as well.

This Association has always maintained that all products should be sold on their own merits, and for this reason had always joined in the efforts to compel the sale of oleomargarine for just what it is, and as it is reported that a repeal of the present oleo law will be attempted in the present session of congress, we will be found as heretofore fighting for our rights in this matter.

The different departments of dairy work in Wisconsin will ask for increased appropriations from the present session of our legislature to push the work all along the line, and have the assurance that they will get about all that they ask for, because of the excellent use made of all past appropriations.

I wish to call your attention at this time to some of the needs of the different departments, and urge your hearty co-operation in securing the necessary appropriations to carry forward the work.

The State Dairy and Food Commissioner, Mr. Emery, my very worthy predecessor in this office, has been for the past three or four years giving a great deal of attention to the need of more efficient inspection of creameries, cheese factories, and sources of city milk supplies in our state, and in his report to to His Excellency the Governor, I find the following:

"I strongly recommend and urge that legislative authority be granted to appoint (1) a second assistant commissioner at a salary of $1,600 and expenses. I believe the law should specify that he be an expert creamery butter maker, skilled in all the technical work of creamery butter making, a practical and

competent judge of creamery products, and versed in modern scientific and practical dairy knowledge.

(2) Eight cheese factory, dairy and food inspectors at a salary of $1,200 a year and expenses. I would have the law specify that each of them be an expert cheese maker, skilled in the technical work of cheese making, a competent judge of cheese factory products, and versed in modern scientific and practical dairy knowledge.

(3) Six creamery, dairy and food inspectors at a salary of $1,200 and expenses. I would have the law require that each one of these possess the qualifications herein specified for the second assistant commissioner.

(4) A chief food inspector at a salary of $1,200 and expenses.

I would have the law specify that the chief food inspector must be a person skilled in the modern grocery business."

The governor in his message has said: "I recommend that the dairy and food commission be provided with a force sufficient to furnish adequate inspection for the cheese factories, creameries, and city dairies and thus put Wisconsin second to none in the protection afforded to her citizens against adulterated food products.

"The efficient inspection of cheese factories and creameries calls for expert knowledge and technical skill of a high order.

"Therefore, a law providing for this inspection should provide that to be elegible to the office, each cheese factory, or creamery inspector, should be an expert cheese maker or butter maker, a competent judge of cheese factory, and creamery products, skilled in all the technical work of cheese factories and creameries and versed in modern scientific and practical dairy knowledge."

With the hearty co-operation of all interested a sufficient force of inspectors is assured that will more than any other one thing at this time aid in enhancing the quality of Wisconsin's dairy products.

Wisconsin has been way behind other dairy states in the matter of dairy inspectors and we should be in the lead.

With our 3,000 creameries and cheese factories but four inspectors have been at work, three of them under pay of this

Association, while in the neighboring state of Minnesota with but 850 factories they have 14 inspectors.

The province of Quebec has 1,500 factories and 50 inspectors.

These are but examples of many other states and provinces.

On account of the great need, this Association has been spending a larger proportion of its funds for inspection and instruction work than we felt really justified in doing, and the appointment under pay of the state of a competent corps of inspectors will make it possible for us to do a little more aggressive work along some other lines.

Prof. Henry, as dean of the Wisconsin College of Agriculture, will ask for another instructor to aid Prof. Farrington in work at the dairy school, and one for increased work with dairy cattle.

Wisconsin owes to this school a debt for the Babcock test alone more than it can ever pay.

The Dairy School is a monument which this Association is proud of, and it will pledge its support in urging the granting of these additional instructors.

As a breeder, the work of one man asked for especially appeals to me and this is a man who shall have in charge the work of the supervising of the official testing of pure bred dairy cows.

The salary and expenses of all inspectors are paid by the owners of the cows tested, or by the breed associations, but the Wisconsin Station as well as nearly all others in the United States agree to supervise such test work.

As was previously mentioned, this work has grown greatly, and now requires practically half of Prof. Woll's time, which should be given to other things.

It is now proposed to have a man specially for this purpose, and who shall be in constant touch with the breeders of the state, and who shall be able through the press and personal effort to greatly aid Wisconsin to be the leader in the quality of its pure bred dairy live stock.

This will be of direct benefit to every dairyman, and will I am sure have your hearty support.

In closing this address, I wish to urge upon every one of you the motto "Forward" in all our work for Wisconsin's dairy interests.

Chairman Goodrich: The President, in his address, has touched upon one very important point, and that is the inspection of creameries and cheese factories. That inspection should also cover the farms of those who produce the milk. There is a bill before the legislature to provide such a system of inspection, and we ought to do all that we can to forward it. I spent some time in Canada in studying their dairy work. We have been told that they get two cents a pound more for their cheese than we do in Wisconsin. Wisconsin people some of them say that we make just as good cheese as they do and that they have some sort of a pull on the English market, and I didn't know but that was so till I went there, but I tell you their cheese is better. Not but what we make some good cheese in Wisconsin, just as good as theirs, but theirs is uniformly good; and what makes it? Twenty-nine inspectors in the province of Ontario, who not only inspect the factories, but inspect the milk and the farms, the way they are kept in order, and if a farmer doesn't keep them in good order and produce good milk, he is told, "You can't bring your milk to this cheese factory and you can't take it to any other, until you have reformed your methods." That is the reason why they have better cheese and why they get two cents more than we do.

It seems to me there is some work for a committee on this address of the President on several points, and I will appoint as such committee, Mr. Fred Rietbrock and W. D. Hoard.

The President resumes the chair.

WISCONSIN'S DAIRY PRODUCTS AT THE LOUISIANA PURCHASE EXPOSITION.

H. K. Loomis, Sheboygan Falls.

(Read in the absence of Mr. Loomis by Secretary Burchard.)

Mr. President, and Members of the Wisconsin Dairymen's Association: When I think of the lack of interest manifested by the cheesemakers, cheese dealers and dairy farmers in the exhibit at the St. Louis World's Fair, I have but little hope of interesting this audience with this subject.

Undoubtedly there are many present who attended the great Exposition, the most wonderful the world has ever seen, and while there, you probably visited the Agricultural building that covered twenty-one acres with over eight and one-half miles of aisles. Under this roof was gathered such a display of agricultural products, agricultural machinery and dairy products as had never been seen under one roof before. These products were gathered from all parts of the world, giving people an opportunity to study and learn not only of our own country but of foreign countries, enabling them to see, in a short time and at little expense, what would cost them thousands of dollars and years of travel. In this great Agricultural building, with its thousands of attractive exhibits, none attracted so much attention as the dairy. The ornamental display of butter by the different states was far better than has ever been seen at any exposition. Minnesota, Oregon, Washington, Missouri, New York, Kansas, Iowa, Illinois, Connecticut and Wisconsin had fine ornamental displays. I will only describe our own exhibit.

These exhibits were in refrigerated cases, with plate glass fronts. Wisconsin was limited to sixteen by eight feet, it being on the corner gave us the advantage of an end view. Eight feet of this space was taken up by a life size figure of a cow, of the dairy type, with a dairy maid standing by her side, one hand resting on the cow and the other holding a pail. This cow and maid were modeled in butter. The contract for this design was let to Mr. Beil, a sculptor of Milwaukee, but the work was done

by two sculptors from Paris who had been employed by the Exposition Company. This was truly a work of art. Every line and curve was perfect. Many times each day I heard this expression: "Here is Wisconsin's butter cow!" Many people from different states informed me that their neighbors and friends who had attended the Exposition said to them: "Don't fail to see the Wisconsin butter cow."

The remaining eight feet of space was taken up with print and tub butter, placed on glass shelves with nickel plated supports. On top of these shelves was a fac-simile of our State Dairy School building, in butter. These also attracted a great deal of attention.

The managers of the Exposition offered awards on butter as follows:

To all exhibitors of butter who exhibited at each of the four contests and whose scores averaged 90 and under 93, a Bronze medal; 93 and under 96, a Silver medal; 96 and over, a Gold medal.

The Wisconsin buttermakers are to be commended for their enterprise in sending in their butter for the contests. We had in June seventy-eight entries, July eighty-two, September seventy-four, October one hundred eighteen. Wisconsin buttermakers were awarded fifty-seven medals: thirty Bronze, and twenty-seven Silver medals. And, of course, a Gold medal was awarded our ornamental display. As regards scores, compared with other states, Wisconsin was second on average scores in June and October, third in July and September. Minnesota was in the lead with more entries and higher average scores. There must be a reason for this and one our people should look into and if possible remedy. The question is, has Minnesota better natural advantages than Wisconsin? Are the men, who are engaged in the business, men of better intellect, or has the state of Minnesota done more to educate and help the buttermakers? In my opinion, Minnesota has no natural advantages over Wisconsin, neither do I believe their men engaged in manufacturing butter are any more intelligent, only as they have had more instruction. Minnesota has a force of twelve instructors, or inspectors, traveling the whole season among the creameries of the state, while Wisconsin has but one. Minnesota has

been doing for their buttermakers what Wisconsin has been doing for their cheesemakers. Results show that the money appropriated by Minnesota has been wisely expended. When the results of the July contest were announced, one of the Minnesota commissioners said to me: "That s worth a million dollars to Minnesota."

Before Wisconsin had a dairy school and before the Dairymen's Association had sent out instructors, the buyer who bought a car-load of cheese found no uniformity. Most of the cheese had a bad appearance. Care was not taken in having the bandages smooth; some were mouldy; others with dirty finger marks, and scarcely a lot without some bad cheese, and none of them as good as are made at the present time. Inspection then was not as thorough as now. Since the dairy school has been started and the Dairymen's Association has been sending out instructors, the cheese are much more uniform, the factories and the cheese are much cleaner and the product much better.

Buyers, at the present time, would not consider cheese, made and cared for as they were twenty-five years ago, of much value.

A Wisconsin legislature never appropriated money more wisely than for the building of the dairy school and the sending out of dairy instructors.

Ex-Gov. Hoard, in his address at the Cheese Makers' convention, in Milwaukee, last month, took occasion, as he expressed it, "to scold" the cheesemakers a little for their lack of interest in exhibiting cheese at the Exposition. After what has been done by the state and what the state is still doing, I think Mr. Hoard would have been justified in scolding these cheesemakers harder than he did. I also think the farmers, the patrons of the cheese factories, deserve a scolding for not insisting on the factorymen sending their cheese for exhibition. They have been receiving a direct benefit for years from the appropriations made by the state and when the state wishes to show its products in competition with other states the cheesemakers and patrons of the factories should show some appreciation. The State Board of Managers did not ask the cheesemakers to give their cheese. The cheese that were sent were sold and each man received his pay for them. We have in this state about thirteen hundred American cheese factories. In June we had sixteen entries; July, thirty-one; September, thirty-nine American

cheese and eighteen Swiss, Limburger and Brick; October, thirty-three.

Wisconsin had sixteen by eight feet of space for American cheese. To keep this space full and make a creditable exhibit I was obliged to buy a number of cheese. There was only one cheesemaker in the state who exhibited at each of the four contests, P. H. Kasper, of Waupaca county, who was awarded a gold medal.

In justice to Mr. Kasper, I also want to say that he wrote me at the opening of the Exposition that he was willing and thought the cheesemakers of Wisconsin could well afford to send in the cheese necessary for such an exhibit in the interest of the great industry in which they are engaged.

The awards offered by the Exposition on cheese were the same as offered on butter. The state was awarded a gold medal on the ornamental display of cheese. In other states there was the same lack of interest by the cheesemakers.

There were more entries of cheese from Wisconsin than any other state or country and our scores were higher. Our average scores in June were 93.26; July, 95.7; September, 97.6; October, 97.12. Only five of our July cheese scored below 95; in September and October, only two each month. The cheese exhibited from Wisconsin in the last three contests were almost perfect and reflect great credit to the manufacturers and to the state.

DISCUSSION.

Ex-Gov. Hoard: I was not a little interested in hearing what Mr. Loomis had to say about Wisconsin's dairy cow, that was on exhibition at the World's Fair. I happened to be a member of the Board of Managers, looking after that matter. When we got the artist on the ground to make this cow, which we wanted to represent a Wisconsin dairy cow, there was a good deal of amusement. The artist put us up a cow that it would be pretty hard to see anything dairy-like about her, except her udder, and when he was expostulated with, he turned around,

and he says, "Why, you want me to destroy the entire artistic effect?" and we told him "artistic" was not the word, "dairy" was the word. We wanted a cow that should show in her lines, in her form and shape, that she was distinctively a dairy cow, and the artist had the beef ideal in his mind and he was putting us up a cow that was not a dairy cow at all, and I found it pretty hard work to convince him. I found thousands upon thousands of farmers in the state of Wisconsin who have the same ideal in mind; they are talking about one kind of cow and building another.

Secy. Burchard: Mr. President, in the interest of truth, I think I ought to add a little, or at least question some statements made by Mr. Goodrich in regard to the market value of Canadian and American cheese. I think if he will look at the market reports for the last two years, he will find that Wisconsin cheese has uniformly sold on the Wisconsin boards of trade at a higher price than Canadian cheese has brought in Montreal.

Mr. Goodrich: When I was there two or three years ago, I studied the market reports, and I found at that time Canadian cheese was quoted two cents upon the market, above American cheese.

Secy. Burchard: Well, three years ago is a good deal of a back number; and, more than that, Wisconsin cheese is not to be graded as American cheese, it is to be graded as Wisconsin cheese. Wisconsin cheese has sold, I won't say every week, but practically every week this year, for more money than Canadian cheese brought in the city of New York. How much of that was due to the efforts made by this Association in this and years past, in sending out its inspectors to go from factory to factory, it perhaps does not become me to say. Undoubtedly the cheese that were exhibited at St. Louis were selected cheese. They came from factories that had been visited by our inspectors from year to year, and that is one reason why the legislature of Wisconsn should not delay to increase the force of cheese and butter inspectors.

The Chairman: It was my privilege to visit a number of times this display of dairy products at St. Louis, and one other state had a cow modeled in butter, I think is was Missouri; one in particular was modeled after a particular Jersey cow that

they valued very highly in Missouri, and it was a fine object lesson to impress upon the people as they passed by, and interesting to listen to the comments that were made, "My, isn't she ugly?" "Her bones stick out," etc., rather than commenting upon her great capacity, her great muscle and really lifelike look as a profitable dairy cow.

JEFFERSON AND MARATHON COUNTIES—WARNINGS AND ENCOURAGEMENTS.

C. P. Goodrich, Fort Atkinson.

Mr. President, Ladies and Gentlemen: It sometimes is profitable to look over the life road we have traveled and see where we have made mistakes and where we have made successes. It is true that we cannot go back and travel that road over again, but we are able to warn others to avoid our mistakes and may be able to encourage them to follow our example when we have made a success.

I believe the great problem before every farmer is how to provide for his family and himself and make profit off from his farm and at the same time maintain its fertility. That can be done. It is done in many countries. Belgium, the most thickly populated country in Europe, has more productive land now than it had five hundred years ago, and it has well supported its population, but the people of the United States came here from the old country and they found a fertile soil; they commenced to rob the soil of its fertility and they kept on moving westward in their work. We want to avoid becoming soil robbers.

Wisconsin has done better than the states east of here. You heard what Governor Hoard said about Indiana and Ohio and I know what he said is true. I also know we do not want it to be true of Wisconsin.

I noticed Mr. Everett said that we did not own the land. I believe that is true; some of us old grizzly headed fellows will

strut around and talk about "My land, I own a great big tract of land," etc., but I want to tell you we don't own an acre of land. It is all God's earth, it is here to feed God's children on, and you and I have no more right to rob it of its fertility and leave it for the next generation to starve on than we have to break into a bank and take away the money that belongs to another. That is the way I look at it.

Now, I will read my paper.

Jefferson county is in the southern part of Wisconsin and was one of the first counties in which the business of tilling the soil was commenced. As early as 1840 the farmer began to put in his work, and in a very few years the county was nearly as thickly settled with farmers as at the present time. The land was rapidly cleared up and made ready for growing crops.

More than half of the county was originally timbered land; the balance "openings"—land where scattering timber grew—and wet prairies with no timber. The county contains 548 square miles. The soil, taken as a whole, was fairly good.

MARATHON COUNTY.

Marathon county is located in the geographical center of the state and was nearly all covered with a heavy growth of timber. It was one of the later settled counties of the state, very little farming having been done till about 1874. After that year the land was rapidly taken by farmers and cleared and fitted for growing crops. The soil, for the most part, is remarkably good, and especially adapted to the growth of all the cultivated grasses and other forage crops. It is the largest county in the state, containing 1,532 square miles; nearly three times as much as Jefferson county.

SOME CENSUS RETURNS.

In 1870 the population of Jefferson county was 34,040, and that of Marathon 5,885; about half being in the city of Wausau and the rest scattered around at the different lumber mills and nearly all engaged in lumbering, and practically none were farming. In 1900—the last U. S. census—there were in Jefferson county 34,789 inhabitants, an increase of only 749 in 30

years. Marathon county had 43,256 inhabitants, an increase during the same period of 37,371. Jefferson county hal 3,453 dairy cows, or one to each man, woman and child in the county, and 2,055 cows besides. Marathon county had 15,519 dairy cows, or a trifle more than one to each three of its inhabitants. That year—1900—Jefferson county raised 27,536 tons of clover and timothy hay, and Marathon county raised of the same kinds of hay, though mostly timothy, 68,448 tons.

SOME FACTS IN THE HISTORY OF JEFFERSON COUNTY.

The early farmers of the county seemed to have the idea that all there was to farming was to plow up the ground, sow it to wheat and sometimes other grains; when the crop was ripe, harvest and thresh it and take it to market, and the next year do the same thing. Thus they went on year after year. They never seemed to think that with every load of grain sold off there went a part of the fertility of the farm, and if this process was kept up long enough, the fertility would be so reduced that no one could get a living from it. Occasionally, indeed, there was a man who could see that this was not the right way to farm, and stocked up his farm with cattle or sheep, and thereby averted the ruin toward which he was tending.

I have in mind a man for whom I worked when a boy. He knew he was not doing just the right way, for I heard him say once: "I know this isn't the right way to farm it; I suppose it will make the land poor after a while, but it will last as long as I live and I don't care a rap what becomes of it then. Let the next generation look out for themselves; I had to look out for myself." But he either lived longer than he calculated, or else the land got poor quicker than he expected, for when he died he left a run-down, impoverished farm which was covered, for all it was worth, with a mortgage that cost his sons, with the best methods of live stock farming, a long, hard struggle to lift.

But the most of the farmers kept on in the same old ruinous way; the crops of grain growing less and the partial, and sometimes total failures coming oftener. When the farmer had a failure of his wheat crop, and the debts he had incurred for expenses in running his farm, and his store and grocery bills, for

the year, became due, and which he had vainly hoped to pay from the proceeds of his crop "after harvest," then he had to put a mortgage on his farm, which mortgage could never be lifted by the old way of doing things.

A CHANGE TO DAIRYING WAS MADE.

As a general thing, farming went on in the way I have been describing till 1870. It is known that at that time more than half the value of the farm lands of Jefferson county were under mortgage, and their productiveness greatly reduced. Things could no longer go on in this way; something different had to be done. Farmers turned their attention to dairying. They were driven to it by force of circumstances. They had to do it, or quit and go west and find new fields to devastate. If their lands had been richer they would have held out longer, but this would only have delayed, for a few years, the final disaster. It is a fortunate circumstance that the farm lands of Jefferson county were more easily exhausted than are the lands of some parts of the country, because the farmers were sooner driven to better methods.

Since dairying has been adopted by almost every farmer, the fertility of the soil has been gradually restored, and on many farms made richer than it was in the state of nature, because what has been raised upon the farm has been fed to cows and the fertility in the feed put back on the land; and, besides, the fertility from the fields of Minnesota and Dakota, in the form of bran and oil-meal, has been bought by the car load and fed to cows to still further enrich the land.

And now the farmer is prosperous; his land will sell for four times what it would when dairying was commenced; the crops of grain and forage are very much larger, and the cow pays a big price for them. Most of the mortgages are lifted and the farmers have good houses and fine, commodious barns; besides having money in the bank. But the best thing of all is; on most farms the fertility has been fully restored so that when we are done with it, we will not leave to those who come after us a barren waste.

The 78 creameries and 8 cheese factories and 36,844 dairy cows in the little county of Jefferson having turned into the

pockets of her farmers about $2,000,000 annually; why should they not be prosperous?

WARNING TO MARATHON COUNTY.

Now, don't think I am saying any of these things to boast; for I am not. I have told you of our sins, and have not tried to cover anything up; of our just and inevitable punishment; of our repentance and our redemption. The main object of this paper is to make emphatic a warning to all farmers who are tempted to do as we of Jefferson county did in early days. The warning is not needed by every Marathon county farmer, for you have cheese factories and creameries and there are many very fine dairy herds and prosperous dairymen. Still, I think there are many who need the warning, and if they do not heed it, will find themselves in the conditon that the majority of Jefferson county farmers were in before 1870—impoverished, with heavy mortgages.

I find some things in the census returns which I have read to you that make me fear for some of you. I find that Marathon county, compared with Jefferson, had one-quarter more farms, one-quarter more inhabitants, only three-sevenths as many dairy cows, but raises 2½ times as much tame hay, mostly timothy. Now, what are you doing with all that timothy hay? You surely are not feeding all that 68,448 tons of hay, besides all the other forage you raise, to 15,519 cows. Some of you are selling the hay off. The man who makes a business of raising and selling timothy hay off the farm instead of feeding it to stock is as surely on the road to ruin as the farmer who makes a business of raising and selling off wheat and burns the straw to get it out of the way, as thousands used to do in the early days of southern Wisconsin.

ENCOURAGEMENTS.

Marathon county is fitted by nature to be one of the best, if not *the* best agricultural county in Wisconsin. No other county has richer land or better water, or is better adapted to raising clover, that sheet anchor of the farmer, or will raise better peas, oats, barley, grass and all other forage plants which are needed

to make dairying successful, with the single exception, possibly, of corn. And even that does better as the forests are cleared off and the sun is let in to warm up the soil; and it will in time, when varieties of corn are planted which are suited to the climate and soil, perhaps, do as well as in most other parts of the state. The butter made here in the creameries is fully as good as that made in the more southern counties; and the cheese is conceded to be better.

Marathon county, with the present number of farms, ought to have 50,000 dairy cows; and, in time, when the farms are developed as they should be in a few years, 100,000 cows. When that condition arrives the farmers of Marathon county will be prosperous indeed.

DAIRYING LEADS TO PROSPERITY.

As one travels about the country in different states he can tell the dairy districts, as he passes through on the train, by the good houses and large barns and other evidences of thrift and prosperity. The commercial traveler will tell you that there he finds his best customers, who buy freely and pay promptly.

There is never a failure of dairy products. Those who depend on special crops have frequent years of failures, but there never was a season yet in Wisconsin when there was not feed enough for cows, of one kind or another, raised to provide fairly well for the year. The dairyman's income with a given herd of cows varies but little from year to year, and he can calculate with reasonable certainty about what it will be. He it not elated at times with the expectation of getting an immense crop and big prices and tempted to run in debt on the strength of it, and then have his crop a failure because of sudden blight or storm, or have the yield greatly reduced by drouth.

The dairymen's income comes steadily along each week, or each month, through the whole year; therefore, he gets into the habit of paying as he goes. When the farmer's income is from some crop that is sold off once a year, he gets into the habit of running into debt at stores. He gets what he wants and the members of his family get what they want, and it is charged

up to him. When the crop is sold and he gets the money, he goes to settle up with the merchant. He is astonished to find his account so large, and he does not have money enough to pay. He has got behind, and the chances are he will be still more behind the next year. After a while a mortgage has to be given to raise the money to pay up. This habit of getting into debt is a bad one, and dairymen are more likely to keep out of it than any other class of farmers.

DAIRYMEN HAVE MONEY IN BANKS.

That dairymen, as a class, have more money to their credit in banks I am sure, for I have made that a subject of special investigation. I found it so not only in Wisconsin, but in Iowa, Illinois and other states.

A few years ago I asked a banker at Fort Atkinson, my own home, if farmers deposited much money with him, and he said: "Yes; we have about $100,000 that the farmers in this vicinity have left with us." I asked him what class of farmers left the most. I told him I wanted to know for a special purpose. He said he would look into it and tell me in a few days. When I met him again he said he was astonished that it was the dairymen that deposited most of the money. He said he could not understand it. He could not believe dairying was so much more profitable than other farming as that would indicate.

After talking it over for a while he finally arrived at this conclusion, which I think is correct: "The dairyman gets his monthly check and goes to the bank to get it cashed; he does not need all the money just then and he deposits some. He now has a bank account started, and he finds it is a nice thing. He likes it. He gets into the *habit* of having a bank account,—by the way a pretty good habit—and he will not draw it all out unless in case of emergency. Then it's a *fine* thing to have. The grain men who get their money once a year, don't do that way. They have a place for it and it don't get into the bank, unless it may be for a few days, sometimes.

Of course, I did not ask who the individuals were who had money on deposit. If I had, he would not have told me, for that would have been violating business rules and would not have been right. He simply told me that dairymen deposited

the most money. Bankers in other places have told me the same thing.

DISCUSSION.

Ex-Gov. Hoard: What special encouragement would you mention for Marathon county?

Mr. Goodrich: To keep 100,000 dairy cows where fifty of them are now, and stop selling off timothy hay. Now, I suppose some men will say, "Why, what is the other fellow that wants the timothy hay going to do?" You better look out for yourselves and let them look out for themselves. Let the Jefferson county fellow furnish the hay. But if a lot of cows are kept on a farm, you can raise surplus hay, and still keep up the soil by raising clover or alfalfa, and while you are doing that, you are getting a bigger income than if you raise forage and sell it all.

Ex-Gov. Hoard: Another thing; in Jefferson county the silo is a very important thing, and they raise forage in that way and save the use of so much hay.

Mr. Goodrich: Yes, that is right. All good dairymen down there have silos, and they have most of their cows freshen in the fall, and that is a great deal of help. They get the largest flow in the winter time when milk and butter are worth the most. Butter is worth 31 cents just now, and cows that were fresh last spring are dry now, and they are not producing any of that 31-cent butter. Another thing, if a cow is properly cared for and fed, she will produce more milk and more butter if she freshens in October than if she is fresh in April. I didn't use to believe that, but I know it is so, and it is reasonable, too, when you come to think about it. A cow that is fresh in the spring gives a good flow of milk if she has good grass and is in good condition and is a good cow, but that only lasts a little while; along in midsummer, in August, comes the heat and the drought and the flies, and she is bound to shrink in her milk, no matter how well you feed her. The flies will torment her, so that no feed will make up for the discomfort that she has. So she goes into the winter, giving very little milk. If

a cow is fresh in the fall and she is properly fed and cared for, particularly if you have a silo to give her succulent food through the winter, or if you can raise roots and do the same thing, you can keep up the flow of milk very well through the winter and when she comes out to grass in May and June, she is almost as good as a fresh cow, and then when the flies and the heat and the drought come, why, it is time for her to be dry anyway.

A Member: Would you advise a man to have Red Polls for a dairy cow?

Mr. Goodrich: I don't want to talk about breeds. I believe in the dairy cow. There are Red Polls that are magnificent dairy cows. There are Red Polls that cannot be dairy cows, because they are beef cows. There are Shorthorns that are splendid dairy cows, but the majority of them are not and it is just so with the Red Polls, "Old Mayflower" and "Mayflower II" of the Red Poll breeds were splendid dairy cows, but they had the dairy form; they were no more beef cows than the scrawniest Jersey you ever saw. If a man is going to make a business of dairying, of course he wants dairy animals, and of course it is wisest to take a breed that has been bred and used for the dairy, hundreds of generations. He is more sure to get good dairy animals.

A Member: Did you ever use the silo as a supplement to the pasture in a drought?

Mr. Goodrich: I never have on my farm. One of my sons feeds ensilage every day in the year, and the pasture was never so good but what his cows would greedily take hold of the ensilage when they came off the pasture. They would come up to the gate at four or five o'clock and bellow for ensilage. They didn't eat a great deal, not as much as they would in the winter, but it was a variety, and they like it.

The Member: That was my experience. I have fed it all summer and found that they like it. What size silo would you advise the average farmer to have on an eighty acre farm in Marathon county, having twelve or fourteen cows?

Mr. Goodrich: You ought to keep more cows. When you build a silo, you want to build one for twenty-five cows and make it 18 feet in diameter and 30 feet deep. One of my sons feeds ensilage the year around, and he keeps just as many

cattle as he has acres of land; he finds it just as good for his young stock. A silo of that size will hold something like 100 tons, or a little more, and if you only feed through the winter, you won't feed over four tons to a cow. If you try it, I am sure you will find it work so well that you will have more cows than twelve or fourteen.

A Member: Would you rather build two comparatively small silos than one large one?

Mr. Goodrich: Yes. The dimensions I mention make a comparatively small silo. If I had a hundred cows, I would not build any silo more than 18 or 20 feet in diameter, but would have more of them.

Mr. Rietbrock: That means a round silo?

Mr. Goodrich: Yes. I suppose that has come to be understood by everybody talking about a silo, that the proper form is round.

Mr. Rietbrock: What is the best approved material?

Mr. Goodrich: There are a great many different ways to build silos. It depends on the cost of the material a great deal. They are building a lot of silos with cement and grout. The first I saw of that kind was in Canada, and then in Michigan, and now they are building them here and they work all right if you have a foundation so that they will not settle. I saw one a few days ago where the ensilage is spoiling, because the foundation has settled and cracked. The first cement silo I saw was built with a wall 18 inches thick and that made a pretty expensive job, because it takes a good deal of cement; then I saw them made thinner and finally they are now making them with a wall only six inches thick. They put in a row of barbed wire right around it, which acts as a hoop, so that there is no danger of its bursting out, and they bed that wire in cement. It is put in with layers of about a foot and with each layer they bed the wire right in.

A Member: Would you recommend a hollow cement wall, made of blocks, with a dead air space between?

Mr. Meyers: I think I could recommend that. The frost would not strike through in cold weather. There is a thing I have observed, that is a good thing. I observe that where the farmers have gone into dairying, it puts the community on a

cash basis. They can pay up their small bills as they go along, rather than run accounts.

A Member: I should think that with the advantages Marathon county has for rock, that we could build our silos just as cheaply out of rock, and more so than if we used cement.

Mr. Goodrich: That may be so if you have rock. If you want to get boulders out of the way, of course it don't cost you anything, and of course that will make a permanent silo, which is a good thing. There were some stone silos built about Oconomowoc in 1880. The walls are two feet thick and I suppose some of them are just as good today as they were when they were first built.

Mr. Meyers: We built some stone silos down in our country and they have been good silos, but we have found that the frost would strike through that stone wall. I think concave blocks would be a good deal better, and then if you build of stone you have to cement it inside of the wall.

Mr. Goodrich: It used to be supposed that freezing ensilage would spoil it, but it is a well established fact that it does not. I have seen it frozen onto the wall of a silo five or six inches thick or more, when it was very cold weather, such as we have had lately. They let that stick on and then when it thawed, it would loosen and come down and it would be all right, only it must then be fed quickly. It must be thawed before feeding, of course, it would not be right to feed it cold.

Mr. Wright: Our farmers can produce plenty of milk, but they are producing it all in the summer time when it is worth about fifty cents a hundred, and they are not getting any of this 30-cent butter. It is going to take some time before they have silos, but I find a good many of them are feeding chopped straw, and they do not really have good luck in making lots of milk in the winter time out of that. What can you recommend for a food ration for the production of milk until we get more silos? Shall we leave the oats in the straw?

Mr. Goodrich: Or cut the oats early for hay; but best of all is clover, and I know you can raise clover all right. Raise clover to feed your cows in the winter; try some alfalfa and see if they do not do well on that. I am sure they will and with alfalfa and clover, if you have cut them properly, you can keep

your cows giving milk well in the winter, although, of course, it will be better when you get a silo.

A Member: If you haven't a silo, wouldn't it be a good investment to buy some bran and oil meal to feed with the clover?

Mr. Goodrich: Yes, that is all right; clover and bran make a well balanced ration, only it lacks the variety that we ought to have.

A Member: Do you think there is much benefit in cutting up good clover or timothy hay? Some people recommend cutting all the coarse food fed to cattle.

Mr. Goodrich: I don't know that there is much good in cutting only where you feed some heavy grain feed like corn meal. If you were feeding corn meal and alfalfa hay it would make a well balanced ration. Alfalfa has 11 per cent of digestible protein. If the alfalfa is cut and moistened and the corn meal put on it, I think that is better than to feed them separately. You don't need to cut all your alfalfa, but a little would lighten up the corn meal.

A Member: Suppose you feed bran, middlings, corn meal and oil cake to your cattle as grain, then feed timothy and clover hay mixed, would you recommend cutting that hay?

Mr. Goodrich: I hardly think it would pay.

Mr. Rietbrock: In adding to clover hay oil cake, corn meal and bran, you add the protein element and it makes the feed all right, but do you add the succulence, I mean the juicy stuff that imitates the grass? You want something juicy and there are two ways of getting that, either through rutabagas or silage.

Mr. Goodrich: The question refers to the feed before they get the silo. If you haven't got a silo, do as well as you can without it.

Mr. Rietbrock: You can get a silo quicker than you can get alfalfa. You could get your silo a year quicker.

Mr. Goodrich: You don't look at it just right. Here is a man hesitating about building a silo; it is going to cost him something and he hasn't the money in his pocket, so he wants to put it off and he asks what he shall do in the meantime. I say feed clover and alfalfa and raise some roots if your pocket will stand it.

Mr. Rietbrock: But bran and oil meal and alfalfa don't make juicy food. It is juice they are after with the silo, consequently you don't answer the question. I say if you can not get a silo, then raise a root crop, rutabagas or something else, some kind of turnip or a beet. But now it strikes me, Mr. Goodrich, that there should be no great difficulty about getting that silo. A silo is not as expensive as people think it is, and there is no experiment about it, the silo has absolutely passed beyond the experimental age; it is a fixed fact that the silo is a grand, good thing. I speak from experience.

The Chairman: Is there any difficulty in raising corn up here?

Mr. Rietbrock: Absolutely no difficulty in raising corn for the silo. There is sometimes difficulty in ripening the corn, but it matures in fine shape for silage, and it yields a very good quantity per acre. I would say in regard to the silo, if you want to build it of something more permanent than wood, I think I would prefer grout, because you must build your silo with something, and if you laid your wall in stone, it would take just as much cement as though you lay it in small stones, gravel, and that is what makes grout. Grout is made of sand, gravel and cement, and if you make good grout you will use no more cement than you will ordinarily in making a stone wall. Our creek beds are full of the right kind of gravel; the Wisconsin river has lots of it; the Red river has lots of it, all the creeks have it, and there is no difficulty in finding excellent gravel for grout. In making grout you use sand and gravel up to the size of a hen's egg, and you use it in the proportion of one part cement to ten parts of sand and gravel, and that will be quite as cheap as to lay up a stone wall and will make you a very much better wall. But if you do it, make the sides, of the wall thin with an air space in between, and that makes a good silo.

Ex-Gov. Hoard: I want to answer the question of the gentleman over here in regard to the use of summer silos. In 1901, we had a most disastrous drought that swept over this state, almost killing the grain crop, and it was bad on the man who had a lot of grain sowed for selling. A hot wave swept up from Kansas and scalded everything down. The cows in the

Fort Atkinson creamery commenced to shrink at once in their yield. Before we were through with it, in three weeks' time, those cows had shrunk from 40 to 50 per cent, and that never came back, and they never will come back. The man that practices summer dairying ought to remember that; that a cow never will come back if she shrinks once. Now, where is he? He has got a lot of poor cows, such as I saw out here in Marathon county the other day, poor, beefy cows, no more fit to be in a dairy than a jackass is. Then he goes to work and he has those cows come in in the spring and along comes a drought and he is cut down.

Now, I want to tell you what I did. I had fifty tons of old silage left over in my silo. The minute my cows commenced to shrink, I opened that silo and gave them fifteen pounds in the morning and fifteen at night, and the cows held right straight up through that drought. Now, what was that worth? Thirty pounds a day at the rate of $2.50 a ton, and that was in my silo. I learned my lesson then, and the next spring I put up a summer silo and I have two now; I would no more be without that to assist me in the summer's drought than nothing under the sun. I don't know what ails all the farmers that they will stand and higgle-haggle about building a silo. The first silo built in the west was a little place dug into the bank in the town of Koshkonong by Levi P. Gilbert, way back in 1878.

Mr. Goodrich: 1877.

Ex-Gov. Hoard: Never mind. Now mind, my friends, there are farmers in that town today you cannot get to build a silo. One old German said to me one day when I said, "Chris, why don't you build a silo? You have been dairying all these years, why don't you build a silo? Is it because you are a German?" "Gott in Himmel," he says, "no." I said "Every German farmer in the town of Lake Mills has got a silo, you are the only one I think in the town that hasn't a silo. What is the matter with you?" He says, "Oh, I think a silo is humbug. I thought a silo was humbug when I commenced, and I think a silo is humbug today, and I guess I think all the time humbug." The old man had simply got the habit, and you can't move it at all, but, my friends, there is more money in

dairying with a silo than there is with any other adjunct about the farm.

A Member: Can you build part of the silo one year and the rest the next year?

Ex-Gov. Hoard: Why, no. You could no more build the silo half way than you could marry a wife half way.

A Member: I know a fellow that has built a little each year.

Ex-Gov. Hoard: But as far as you do build, you must build it perfect.

The Member: Oh, yes; he put it up about ten feet the first year.

Ex-Gov. Hoard: But it doesn't cost much. You build a barn today in Marathon county and it will cost you from $7 to $10 a ton for storage capacity for your hay, to build. You can build a silo for $1.50 a ton storage capacity.

Mr. Rietbrock: In other words, a silo to hold 100 tons would cost about $150, and that ought not to scare any reasonable man.

Mr. Everett: There is another point in reference to building by degrees. You ought to build it complete the first year and be done with it, because the deeper the silo the more it will hold and the better the silage.

The Chairman: I know of a man who built a silo, and put up the stone work and roofed is over with a temporary roof. He put into it practically every dollar he could raise, but it was a good deal better than to go without having any. It has worked all right.

Mr. Meyers: Have you had any experience in putting alfalfa into the silo?

Ex-Gov. Hoard: I have seen it done, but I have never done it myself, and I don't see any good in doing it. I want the alfalfa in the form of hay, because I have got the succulent food in the corn silage and I want this variety. I grow about thirty to forty acres of alfalfa. I had less last year, and I have been suffering for it all winter long, and I hope to have forty acres this year, if it comes through the writer all right, and I guess it will. You can grow alfalfa in Marathon county to beat the band if you have a mind to take hold and try it.

Mr. Quaw: What is the relative value between clover and alfalfa for feeding?

Ex-Gov. Hoard: It can be very well measured by the chemical analysis. This chart on the platform shows that there is 11 per cent of protein (which is the element that makes milk, largely, and muscle, and all those elements which are the most valuable) in alfalfa. You buy bran to get protein; you buy oil meal to get protein; you buy gluten meal to get the protein, all these foods that we buy down in the southern part of the state. Now, clover contains 6.8 digestible protein, alfalfa is 11 per cent; bran is 12.6. Alfalfa is within two points of being as rich as bran. When the farmer is growing alfalfa, practically he is growing so many tons of bran, particularly with the second and third crops; the first crop is a little coarser. You old German farmers call it Lucerne. It is considered a very fine hay in Germany. That is the difference between alfalfa and clover. But now see, how much clover is worth more than timothy. I talked the other day with a lot of farmers and they had a great deal to say about timothy. Why, we no more think of feeding timothy hay down in Jefferson county than we would of feeding marsh hay; we don't raise it. Timothy is only 2.8 per cent, three pounds in the hundred, and yet when I talked to these old farmers out here at Eden, I couldn't get into those men's heads that timothy was poor hay for the cow. You can sell timothy for so much, sure enough, and many short-sighted men do sell it and think they are getting their money back, but every pound of clover is worth two pounds of timothy to make milk, and then you have got as much more in the alfalfa as 11 is bigger than 6.8. Now, I want to say another word about alfalfa. How many of you could take timothy hay and keep a lot of brood sows, say from the last of November till next spring on timothy hay? Could you do it? Yet, for every year for several years, I have kept all my brood sows on nothing but alfalfa hay, and I would like to see a man raise a finer lot of pigs than mine. An old Irishman came in and looked at them, and he said, "For the love of God, they ate it like bastes." There are a lot of brood sows there producing these little bodies, they have a beautiful lot of pigs and they are cool and comfortable and milk like cows. I fatten seventy-five out of seventy-eight I raise. Before that time I was troubled all the time with my pigs, I would be feeding them corn, and it was all wrong. The alfalfa shifted them over en-

tirely, not one spoonful of corn did I give those sows. They got their drink, a little skim milk left after the calves were fed. They are in good flesh, they are just as fat as they ought to be, and when the pigs come they are bright and strong and healthy and vigorous, and they go right ahead. My friends, you have not thought out this alfalfa question, and I want to say to you that Marathon county can produce alfalfa magnificently. Your ground is covered here with a fine snow every winter, and one of the best things in the world to save alfalfa is to have soft snow on it. You want to begin to think it over.

Mr. Everett: I have just one word to add to what the governor has said. The idea is brought forward here, clover or alfalfa. Why wouldn't you say clover and alfalfa? Alfalfa is not a crop for rotation. Clover is all right for the common farmer.

Mr. Brumalty: I tried alfalfa and wasn't very successful with it. I sowed it with winter wheat in the spring.

Ex-Gov. Hoard: Oh, well, that is the reason. It cost me $60 to learn your lesson. I sowed it in the spring and went over it with the harrow three times, laid logs on the harrow. I sowed $60 worth of seed, and I never got a spear. You can grow clover that way; but try an acre of alfalfa. Get half a bushel of alfalfa and try a good piece of ground that is well drained, say one acre. Sow nothing but alfalfa, plow the ground. Remember, you cannot make it catch as you do clover. I can go onto your fields in the spring and sow clover and it will catch nicely, but you cannot do that with alfalfa. It must have the ground prepared just as finely as you would prepare it for wheat or barley or oats. Just try one acre, get into the habit, study it for five or six years; it is something that you need to study a good while before you know how to handle it.

Mr. Rietbrock: Will you explain about the varieties of alfalfa as between the common and the Turkestan?

Ex-Gov. Hoard: I have got both and I can't tell the difference.

Mr. Goodrich: Nor I either.

Ex-Gov. Hoard: The Turkestan is there yet and the other is right by the side of it, and I don't know which is which, and which is tother, but this much I would say, get good alfalfa seed. You are liable to be imposed upon, so I wouldn't advise you to

sow a whole lot anyway, but sow one acre and study it. It is a ticklish plant; it is a jealous plant; you want to study it, but when you have got it, you have got the finest hay that any man ever saw on earth, for every thing. Why, think of it, my friends, today there are two big mills in Ohio and Kansas City grinding alfalfa and selling it at $15 a ton for poultry meal all over the United States.

Question: Do you harrow this alfalfa after you put it in?

Ex-Gov. Hoard: Oh, certainly; get the land very fine, work your land nicely, sow on thirty pounds, then harrow it once or twice and let it go.

Question: How about cutting it in the fall?

Ex-Gov. Hoard: I wouldn't cut it the first year; I would let the weeds and the alfalfa grow and let it all alone. That is my practice; other men talk differently.

Mr. Goodrich: There is one thing it would be well to mention in talking about alfalfa. It won't do on all kinds of ground. Land that is too low, so that the permanent water line is within three or four feet of the surface will not do for alfalfa, because the roots have to go down.

Ex-Gov. Hoard: I have dug down twelve feet, twelve is the deepest I went down with the alfalfa three and four years old. I saw an alfalfa root suspended from a cupola in Denver that they said was 100 years old, and those roots were thirty-four feet long. I don't know but what we will have to establish an alfalfa communication with China. But it makes a wonderful growth. Mr. Everett said you would have to use clover for rotation. Just to give you an idea, I will tell you, I sowed last spring eight acres of clover with a peck and a half of barley as a nurse crop and I sowed twenty-two acres of alfalfa with a bushel and a half of barley as a nurse crop. I took off the barley and let the clover and the alfalfa go. Two-thirds of the clover died after I took off the barley, and all of the alfalfa lived. It is more hardy with me down there than clover, more certain, more sure, but with you here, you have no difficulty in growing clover, have you?

A Member: It grows here like weeds.

Ex-Gov. Hoard: All over this country, and yet when I rode down to Eden the other day, there was three times as much timothy grown as clover. Now, why?

Mr. Everett: It is a more marketable crop.

A Member: I think timothy is raised because it is bought largely for feeding horses; a good many people like timothy better than they do clover for feeding horses. For my part, I would rather have half the amount of clover than good clean timothy hay.

Mr. Jones: It is best to cut down the weeds the first year?

Ex-Gov. Hoard: You cut the weeds down to kill them, don't you? Now, just as much as you hurt the weeds you hurt the alfalfa, and your great point is to get that young, tender alfalfa plant to have just as much growth at the top as possible in order that it may make a corresponding growth at the root, and if you cut off this young alfalfa you are liable to kill the plant. John Widman left a strip right along where he did not cut it off, and that strip today is very much superior to the rest that was cut off. Let the weeds grow the first summer and next year there won't be a weed there, you will cut the alfalfa three times and that will kill all the weeds. In the first place you want to sow it thick enough, half a bushel to the acre, and that will help keep the weeds down; then let it alone. Put it in in the spring of the year, in March, on a slope, if you can, so that the water runs off readily, and does not form little ice caps. Put it on as rich land as you can, and sow a bushel or a bushel and a peck of barley with it, if you choose, and then when you cut the barley, cut it high. Then let the alfalfa alone, and it will come on and make a good growth. Then the snow will come on and your alfalfa will have roots down in proportion as it has top above. If you cut it off two or three times, it certainly will injure this root crop.

Mr. Everett: How about pasturing it?

Ex-Gov. Hoard: Never pasture it; never turn a hoof onto alfalfa. Men talk to me about pasturing alfalfa all the time. Let me tell you what I did. I took a hundred and fifty tons of alfalfa worth $10 a ton off of thirty-two acres. Now, would you pasture a piece of ground that was earning that amount of money? I have had pieces of alfalfa that have grown me in three cuttings a little over six tons to the acre. Now, that would sell ordinarily in the Fort Atkinson market at $10 a ton, and that is $60 an acre, and yet men will talk to me about pasturing. Why, that kind of men would turn milk bottomside

up and skim the underside. The trouble in putting cattle or horses onto this alfalfa is this, the crown is very tender, it sprouts above the surface of the ground. Those sprouts come out of the dirt on those crowns and any weight badly injures them. If you draw a wagon load of hay after the first cutting over your alfalfa field, you can see the tracks of those wheels in the second cutting showing exactly the impression of the wheels on those crowns. Therefore, never let a hoof of any kind on your alfalfa.

Mr. Howard: How do you cure alfalfa?

Ex-Gov. Hoard: That is a very important question. I cure alfalfa hay and I cure clover hay in the cock with hay caps. Now, I scare some of my farmer friends half to death! Why, we always cured hay in the windrow. But, you know, alfalfa, if you cure it out in the windrow in the sun, you lose half the leaves and that is the richest part of it. Now, I go and get forty-inch wide Pepperil A sheeting, tear off forty inches. That makes an ordinary hay cap. I tie a ten-inch string to each corner. I tie a half of a horse shoe to each corner, and there is your hay cap. Load them onto a stoneboat and draw them out into the field, after the hay is cocked up, and it is cocked up just as quickly as it will handle. It is cocked up and a hay cap thrown right over the top. The first crop will come about the first of June, and you are pretty sure of showers about that time. That hay cap will shed every bit of rain off from that alfalfa, and it won't hurt your hay at all. It costs you 12 cents a piece for those caps and they will last me, hung up in my shed and taken care of, five or six years, and in one season they will pay for themselves twice over in the quality of the hay. You look down my field and you would think there was an army of soldiers camping there, that thousand hay caps. Then every forty-eight hours two men go along with forks, stick them into the hay cock and pull it to themselves off the old ground. They go very rapidly, pulling it along, and after about two or three days the hay cock is opened up for a few hours on a fair day. It has gone through the first sweat and that is the dangerous sweat; no hay ever enters into combustion or gets on fire after it has had the first sweat. You give it that first sweat in the filed, then as soon as you open it and give it about an hour or two of air, you load it onto your wagon while it is still

quite damp and you save every leaf to be hauled into your barn and packed away? It will come up then to the second sweat and then your hay will come out of that mow beautifully green. Those hay caps are worth everything to anybody that wants to cure clover or alfalfa. We treat clover in the same way exactly. I want to say that almost every man, every farmer in the country, cuts clover too old. Do you know why clover kills? Largely because you kill it. Clover is a biennial and the minute the seed forms in that clover, that is the end of that root, it has got to die. Now, if you want to keep your clover, cut it just before the seed forms and then Nature in the effort to produce seed will shove up from the ground a big, strong, second crop. Cut that in the same way and she will shove up the third crop. Now, then, if you let your clover blossom and the heads get brown, then they are full of seed and you have killed your clover. I cut my clover just as quick as it commences to blossom, no matter whether the weather is wet or dry, because with the hay cap I can handle it. Without the hay cap I can do nothing with it. With alfalfa, just as soon as you see the little blue blossoms come, when it is not probably one-fiftieth in blossom, in goes the mower, and then a strong crop follows. Your cutting the second crop is always in proportion to cutting the first crop early, and so with the third crop. If you let the crop stand too long, you get a weak crop following.

The Chairman: I am sure we have all been profited by this alfalfa discussion. If you want to realize how much, go home and try it; that is what I did last year and I have as a result six acres of alfalfa that went into the winter in good shape.

Secy. Burchard: The question of feeding has come up here. I happen to have in my pocket a little item that I wanted to show personally to one man that I expect to see here. This is the amount of foods that were fed to the famous prize-winning cow "Loretta D," during the St. Louis dairy cow demonstration, and it is instructive in many ways. Of course, that cow was fed more than we ordinarily feed dairy cows, but the selection of feed is the important thing. That cow was fed 120 days; 114 days she had alfalfa hay; the average amount was 19.4 pounds a day. She was fed on alfalfa mixed with a grain feed, 117 days, and the average was 6.38. She was fed clover hay four days, simply to splice in when they did not have al-

falfa, I suppose. She was fed corn silage 120 days, the average amount was 12.15 pounds. She was fed a little corn meal 111 days, out of the 120. She was fed bran 120 days; ground oats 48 days; rolled oats 25 days; oil meal 119 days, and the average per day was 1.82, not a very heavy feed. Cotton seed meal, 55 days; gluten feed, 117 days; 3 other foods less than a hundred days. That shows what that man who had that cow and the others in charge, thought were the best things to feed for getting the largest and the most profitable production. All these were given a special money value.

Mr. Goodrich: Have you got the figures there how much she produced?

Secy. Burchard: Yes. In the 120 days she produced 5,802.7 pounds of milk. The daily average was 48.35. The amount of fat produced, pure butter fat, was 280.16 pounds. The average per day 2.33. The estimated butter product was 333.03, an average of 2.75 pounds daily for the 120 days. That was the return for the amount and kind of foods that I have read to you.

Mr. Goodrich: She produced $82 worth of butter at 25 cents a pound. The cost of all of the food was $32 and some cents, which I haven't exactly, but it left a clean profit of $50 in 120 days, feeding the cow as she was fed.

Secy. Burchard: I want to say a word or two in reply to what Mr. Rietbrock has said about juicy feed, silage or roots. I believe it is a good thing for every farmer to have these things, but if he doesn't have them, either from lack of attention or laziness or want of conviction, during the winter months when he is feeding dry forage it will pay him to feed at least one pound of linseed oil meal daily, and that, in a large degree, helps, the same as the juicy feeds spoken of here.

Mr. Quaw: I am afraid that what has been said about alfalfa may lead our farmers astray. Our soil in the spring is quite springy, wet, even up on the sides of the hills, and I do not believe that land would do for alfalfa. We are troubled a good deal with that in our country, that our land does not drain out quickly in the spring.

Ex-Gov. Hoard: Your land is heavy clay, is it not?

Mr. Quaw: It is clay and loam together.

Ex- Gov. Hoard: My land is very heavy clay and I am de-

layed about working it in the spring, because I cannot get onto it.

Mr. Quaw: Well, we have here, in a good deal of our land, springy places, even on the side hill, you cannot put a team on it early, and that lasts quite a long time. Now, I would like to know whether it will pay to try to put alfalfa on land of that kind.

Ex-Gov. Hoard: Does that last so long that you cannot work the land and sow it to grain?

Mr. Quaw: There are some places that I have to wait, but probably all farms are not afflicted as badly as I am in that way. I have a good many of those springy places on the side of the hills.

Ex-Gov. Hoard: Do you find it down on the level?

Mr. Quaw: No.

Ex-Gov. Hoard: Well, put it there then.

Mr. Quaw: Wouldn't it be better to go up on higher land where there are no low places?

Ex-Gov. Hoard: Put it up there.

Mr. Quaw: But isn't it absolutely necessary to have land that is well drained?

Ex-Gov. Hoard: On general principles, yes; but go and try it where you think it won't grow and satisfy yourself whether it will or not. You know seeing is believing.

Mr. Quaw: I have seen some friends that tried it and made a failure of it.

Ex-Gov. Hoard: People made a failure of it in this state for thirty years, but we are now commencing to make a success of it. For thirty years men have been saying, "You will never grow alfalfa." When I started, even Dean Henry said, "Hoard, I am afraid you will never succeed with it." But now it is growing all over Jefferson county, and Professor Henry himself is a believer in it. You see we didn't know what to do, we were working in the dark, but every farmer that started in to grow it himself and stick to it, has learned about its nature, about what to do with it, and that man is no longer a fool on the question. In Jefferson county, there is five hundred times more alfalfa than there was ten years ago, yes, a thousand times.

Mr. Robinson: How is this alfalfa adapted to our sandy land?

Ex-Gov. Hoard: We have got sandy land south of Fort Atkinson on which alfalfa is doing very finely. We have very sandy hills and it is doing well. Over toward Palmyra they have very sandy land and they gave it a heavy dressing of barnyard manure, and succeeded in starting alfalfa and it is doing very nicely. I believe alfalfa will grow in a thousand places where at first you and I would say it would not grow, but there is just one place that I would bar, and that is where if you dig down for a well you strike water at three or four feet from the surface. That won't do.

Adjourned till 8 o'clock P. M.

Convention met at 8 o'clock P. M.

President Hill in the chair.

The exercises of the evening consisted of vocal and instrumental music and addresses by Mrs. Adda F. Howie and ex-Gov. Hoard. The latter was so rich in interesting reminiscenses that it is inserted here in full.

WHAT A THIRD OF A CENTURY HAS WROUGHT.

Thirty-three years ago the present month, the senior editor of Hoard's Dairyman issued on his own responsibility, a call for the formation of the Wisconsin Dairymen's Association. At that time there were possibly twenty small cheese factories in the state. Dairy knowledge of any and all kinds was at the very lowest ebb. Such a thing as a Holstein or Guernsey cow had never been seen in the state. A very few Ayrshires and Jerseys had been introduced, but, not one in five hundred of our farmers would know that they were Ayrshires or Jerseys if they saw them.

The farmers of Wisconsin were given up to the raising of wheat and it had brought them to severe poverty, as well as destruction of the fertility of the soil. The period of high prices for farm products on account of the Civil War had passed.

The agriculture of the state and the hope and pluck of her

farmers were in a slump. Farmers were selling out their farms for what they could get, prices ranging from $18.00 to $25.00 an acre in the oldest sections of the state, and moving to Iowa, Minnesota and other western states in great numbers. They had no other idea of farming than the same loose, wasteful method they had practiced in Wisconsin.

The call for the formation of a State Dairymen's Association was responded to by seven men, four of whom are living at this writing. It is difficult to express in words how little was known of the true meaning of dairy farming at that time. A cow was a cow and that was about all that anybody knew concerning her. There was no idea of breeding cows especially for dairy purpose. We doubt if there were five hundred men in the entire United States who had such ideas and were trying to work them out. The state of New York, Western Reserve in Ohio, a portion of Vermont and New England were known as the cheese-producing sections of the country. The factory system had been introduced less than ten years previous. No one had heard of a Canadian cheese or cheese factory at that time, although a start had been commenced in the Dominion by a Mr. Farington, a relative of the Faville Bros. of Lake Mills, Wis., who were pioneers in the industry in this state at that time.

Such were the feeble beginnings of this now mighty industry in Wisconsin which has since spread over the entire nation, with wonderful developments in Denmark, Germany, Sweden, Russia, Australia, New Zealand, and even in Argentine. It is more difficult to describe what it is now than what it was not thirty-three years ago. A great intellectual impulse has been imparted to dairying in all its branches and details. To this and this alone is due the remarkable advance in understanding and accomplishment which has been wrought. Agricultural chemistry has poured a flood of light upon this question. Out from this source has come the Babcock milk test; the Wisconsin curd test, and all we know concerning milk constituents, feeds and feeding, the application and office of fertilizers, and the reconstruction of our soils.

It must be remembered that our farm lands from the Atlantic to the Mississippi river have been subjected to the fearful strain of ignorance and wasteful tillage ever since the American farmer commenced his march westward. His path has been

marked by destruction of forests and fertility at every step of his way. The American farmer in the main has despised science, because he was ignorant of science and what she had to contribute for his welfare. His class has had the poorest educational facilities of any other class in American society, unless it be the slums of the cities. The main chance he has had for education and culture for two hundred years has been the country district school with its poor buildings, poorly educated and poorly paid teachers, no library, no apparatus, and the bare opportunity of four months in the year of such education at that.

Do you consider that 95 per cent of the farmers of this country as they stand today never had any other chance for education than the country district school? What did that school ever do for them in the way of teaching them anything about their own business? Has it ever said a word to them about the way they were destroying the fertility of their farms? No! Has it ever taught them a word concerning the meaning of the scientific terms that are used in the current literature of the farm? No! Can you expect that men will want to read such literature, even if it be ever so valuable when they cannot understand it? Would the lawyer or the doctor or the engineer, or the editor be the men they are today if they had not been trained to understand the language that is used in the books and papers that are devoted to their profession?

Thousands of farmers, earnest seekers after light and knowledge, have written to Hoard's Dairyman asking for an explanation of the meaning of the terms in agricultural chemistry that we were obliged to use in discussing feeding problems. So great did this demand become that we were obliged to place at the head of our column of Inquiries and Answers, a short glossary explaining the meaning of those terms.

Do you not see that the country district school was to blame for all this lamentable darkness of understanding? Had it been the school it ought to have been; had the farmers of this country realized the tremendous necessity for a better quality of farm intelligence than they possessed; had the teachers of the land realized it; had the law makers realized it; had we all realized that without this valuable knowledge the soil must suffer in fertility; the state must decline in prosperity and agriculture languish just as it did in 1870,—I say had this country

school problem been understood as it should have been, do you think New York would have lost over fifteen hundred millions of dollars in the decline in value of her farm lands in 30 years? No! Would the same bad results have been seen in the fine old farming lands of Ohio and Indiana, and Illinois? All that stopped this wave of disaster in Wisconsin, caused by the ignorance of the farmer concerning that which his own country school should have taught him, was the coming of the cow.

Do you not see that what we need is more light, not more land; more understanding of the elementary foundations of agricultural science among the farmers, a better system of country district schools, where the farm boy, the farmer who is to be, may acquire a knowledge of such elementary knowledge just as he does a knowledge of elementary arithmetic, grammar, geography or physiology? The country school must of necessity be elementary. Does not the state owe to the farmers the chance that the elements taught there shall be of as great assistance as possible to them in after life as a farmer? Should you not as farmers begin to exercise your own influence in behalf of such a system of country education? Should not every merchant, every banker, every lawyer, every preacher, every editor, raise his voice in favor of such a consummation? Should we not all as patriotic citizens help build a body of conviction and sentiment which shall make the country district school what it deserves to be, a bulwark and living force for the enlightenment of the sons and daughters of the farm, for the sake of a safer, a better and more profitable order of farming, a higher order of farm citizenship.

I said to you that what saved Wisconsin from this wave of destruction in farm fertility and land values was the coming of the cow. How did she compel a new order of thought and practice?

In this way: Associated dairying, co-operation of farmers in factories and creameries became necessary in order that the product of the cow might be made the most profitable. This was the beginning of farm co-operation. Farmers had never learned how to co-operate. It was a tough job in many instances then, has been since, and is yet. The farmer that co-operates with his neighbor must be of a more intelligent order of intellect. It is a sign of good brains, good understanding,

good heart, and good citizenship to be able to work together to a common purpose. That is the meaning of the word "Civilization." It is the antithesis of barbarism.

The Wisconsin Dairymen's Association meant co-operative thinking, planning and discussion of means to ends. That means education. From out this Association came a host of beneficent agencies, all working to a common end and purpose. It was this Association that first started the Farm Institutes, the Dairy School at Madison, the Dairy Boards of Trade. It worked out to a favorable result the reduction of freight rates on butter and cheese to the seaboard from the maximum of 2½ cents a pound on cheese, in common cars in 1874, to the present rate of less than 75 cents per 100 lbs. in refrigerator cars.

It has poured forth a flood of thought and discussion upon the minds of Wisconsin farmers in its thirty-three years of existence. The best and most practical dairymen, scientists, bacteriologsts, chemists, and breeders of dairy cattle have poured into its conventions the richest and most valuable results of their life and thought. All this to make the Wisconsin farmer an intelligent man in the conduct of his business. Wonderfully has the state responded in the material growth of herds of cows, cheese factories and creameries. In like manner have we kept pace in the quality of our product, as witness the awards of merit which we have won, beginning with the World's Fair in Philadelphia in 1876, when we won over all the world on cheese, followed by the Great International Dairy Fair in New York in 1878–9, when a Wisconsin girl won over all the world on butter. From that time on, Wisconsin has been to the front at the World's Fairs in New Orleans in 1864, at Chicago in 1893, at Buffalo in 1901 and at St. Louis in 1904.

Today, in marvelous contrast with the situation which your speaker confronted thirty-three years ago, we now have one of the greatest and foremost dairy states in the world. The cow is at once the pioneer in the transition from lumbering to farming, and the final finisher of agricultural faith in the oldest counties of the state.

Our progress is limited only by one factor, that of the growth of dairy intelligence among the farmers. In proportion as they remain ignorant and unenlightened as to the true meaning of

dairy farming, is our advancement slow and halting. Just as fast as they recognize the need of more and better knowledge do we go ahead. Our main hope for the future must lie in the boys of the farm. We want them to bring wealth and renown to Wisconsin as the producers of the finest breeds of dairy cattle and other domestic animals in all the land. We want them to become broad minded, well trained, highly intelligent dairy farmers, producing the finest butter and cheese in America, selling skill and brains, not ignorant muscle. We want them to comprehend the real foundation of this great industry, how that the factory and creamery are not first in any sense, but, rather the farmer, the cow and the farm. Here at the farm end must be the inspiring thought, brain and purpose that shall make all the rest we hope for possible, and, without which, we can have no hope of progress.

All that we have gained in this wonderful transformation of a third of a century, has been wrought out by making the mind of the individual farmer intelligent on dairy questions. The whole procession must wait for him, and there is no help for it. Is there not great significance then for the future of our greatness as a dairy state, in my plea that the country district school shall be made what it ought to be in giving to our farm youth something that shall equip them better than their fathers were equipped for the problems that lie before him. Our farm boys are bright and brainy. Give them a right start and they will finish the race for themselves by modern aids to intelligence. Let every farmer remember one thing: the way to become a strong, influential citizen is first to become a progressive, masterful farmer. There and only there is the seal royal to his standing as a man among men.

Adjourned till 10 o'clock A. M., next day.

MORNING SESSION, THURSDAY, FEBRUARY 9, 1905.

Convention met pursuant to adjournment at 10 A. M.
President Hill in the chair.

The chair appointed the following committees:

Resolutions: C. P. Goodrich, W. J. Gillett and E. C. Jacobs.

Nominations: H. C. Taylor, P. J. Drissen, Mrs. Adda F. Howie.

Finance: F. H. Scribner, Wm. Erbach, U. S. Baer.

Exhibits: E. H. Farrington, T. Corneliuson, Prof. R. B. Johns.

THE FARM SEPARATOR CREAMERY SYSTEM.

T. Corneliuson, Belleville.

Mr. Chairman, Ladies and Gentlemen: The invention of the cream separator gave great impetus to the development of dairying, and what are now generally known as "whole milk creameries" were established throughout the country.

Many of those creameries, however, soon met with great problems and difficulties. In more sparsely settled localities and localities in which dairying was followed as a side issue only, it was found necessary to cover too large a territory in order to get enough milk to operate the creamery profitably, necessitating long hauls to the creamery with the milk daily thus making the transportation too expensive. Another serious drawback was the poor condition of the milk when it reached the factory, being frequently sour or tainted, owing to the long distance hauled, and by the time the skim milk was returned to the farm it was frequently worse than useless. This led to the establishing of skim stations and it was thought this scheme would solve the problem. However, that system was soon found too

expensive, also, and when at about this time the hand or farm separator appeared on the scene it met with great favor, and soon displaced most of the skimming stations, and in many instances the creameries themselves either wholly or in part changed to the farm separator system, so that today over a large part of the state scarcely a creamery can be found that does not handle more or less of farm separator cream.

A system which can gain such a foothold, in less than a decade of time, must evidently have merit, yet, I have not found a single buttermaker who contended that "The Farm Separator Creamery System" as it is now conducted resulted in improvement of the quality of the butter. On the contrary, practically all agree it is retrogressing as far as the quality of the butter is concerned; and I am fully convinced that this system, as it is now generally conducted, constitutes a grave menace to the good name of Wisconsin as a butter producing state.

Some of those creameries are operated with total disregard of all that has heretofore been considered good dairy and creamery methods, allowing their patrons to disregard cleanliness and care in the handling of the product, accepting anything that is offered in the form of cream.

We have been taught that the ripening of the cream is the most important step in the entire process of butter making, that cream ripening required skill, training and painstaking care on the part of the operator, and suitable apparatus for controlling the process, yet, this most important work is now transferred from the creamery to the farm, during a large part of the year at least, by practically all farm or hand separator creameries.

If Wisconsin expects to retain its position as a leading butter producing state, this very important work of cream ripening must again be restored to the buttermaker, and that will mean that the cream must be delivered to the factory in a sweet, pure and wholesome condition, as it is simply idle to talk about ripening cream which has already been ripe for several days, and during all this time been kept at a temperature favorable for bacterial growth.

There is no good reason why just as good butter should not be made from farm or hand separator cream as from any other. In fact, some of the best butter that it has ever been my privilege to see or taste was made from farm separator cream. But,

to accomplish this, it is necessary that cleanliness and intelligent care in handling the products, while yet upon the farm as well as in the factory, be conscientiously observed at all times.

It has been suggested that the cream be delivered to the factory every day, and wherever that is possible this is recommended, but in many localities that would not be practicable, as it would entail almost as great transportation expenses as the whole milk system. It seems more feasible to give the cream such care as will enable us to keep it sweet and wholesome for two or three days, according to season. This is entirely possible.

Cream which has been kept two days, even though it is sweet, will lack the quality peculiar to fresh cream, but this is easily overcome by pasteurization and the use of a first class commercial starter. But no amount of pasteurization or any other process yet known will enable us to make first class butter out of old, tainted and overripe cream, in which gaseous and perhaps putrefactive fermentations have been allowed to go on for days and perhaps a week, although such cream may be considerably improved by pasteurizing it.

Every dairy farmer who uses a farm separator should provide a suitable milkhouse or dairyroom where the separator and other dairy utensils as well as the cream may be kept and cared for. Such a house or room need not be expensive, although it should be substantally built and in such place and manner as will enable one to keep it, as well as its surroundings, in a clean, pure and sanitary condition.

The custom of placing the separator in the barn or cow stable should never be tolerated.

A liberal supply of ice should also be provided in order to be able to control the temperature of the cream at all times.

Immediately after milking, the milk should be removed from the barn and separated and the cream cooled to 50° F. or below and held at that temperature till delivered to the creamery. Warm and cold cream should never be mixed. In winter precautions should be taken to prevent the cream from freezing.

No creamery can expect first class cream simply for the asking, but if first class butter is worth more money than second or third class, then first class cream is certainly also worth more

than the poor and inferior grades from which only poor butter can be made, and should be paid for accordingly.

Every farmer delivering first class cream should object just as vigorously to being classed with the careless and slovenly as he would if his test for butter fat were lowered several per cent just to even up with those having cream less rich in butter fat than his own. And it is to be hoped that the farm separator creameries in Wisconsin will all in the near future establish the principle of paying for the cream not alone according to the Babcock test but also according to the acidity or titration test, supplemented by good judgment at the receiving stand.

DISCUSSION.

Mr. Scribner: Do you think it is possible to deliver cream to the creamery twice a week and have it safe, a good product?

Mr. Corneliuson: I think that depends largely on the way it is taken care of. If you take proper care of it, I think it is possible to deliver twice a week in the winter, but not in the summer.

Mr. Scribner: What do you call proper care?

Mr. Corneliuson: Such care as will keep it sweet and it ought not to be kept any longer than you can keep it sweet.

Mr. Scribner: I can keep cream sweet a week. Do you think that would make first class butter?

Mr. Corneliuson: You can't do that unless you pretty nearly freeze it, can you?

Mr. Scribner: Yes; I can do it by cooling it down and keeping it in ice water, still I think it might develop some flavors, although it might be sweet, and these flavors might affect the butter.

Mr. Corneliuson: Certainly it would not make first class butter unless you pasteurized it. I believe with pasteurization it is possible to keep cream three days in the winter time and make first class butter, but not otherwise.

The President: As a neighbor of Mr. Scribner, I know how he keeps his cream, and I am sure I tell the truth when I say that Mr. Scribner's Friday night's cream is sometimes

eaten on Milwaukee breakfast tables on the next Wednesday morning, and it is perfectly sweet.

Mr. Corneliuson: You couldn't expect that kind of care at the average farm.

The Chairman: Of course Mr. Scribner's cow stable is ideal.

Mr. Chambers: Is Mr. Scribner's separator in the barn?

The Chairman: Yes, it is in the cow stable.

Mr. Rietbrock: Now, right on that line, I think we should have more light. I know about ten establishments that we may consider as ranking first class in the state of Wisconsin. Some of the very best dairymen in the state have their separator in the barn. I don't consider myself much of a dairyman, but I have a separator and I have it in the barn, too, and I do it, because so many of my acquaintances who are first class in their business have their separators in the barn. This morning we are told by Mr. Corneliuson that that is to be condemned if we are to maintain the reputation of Wisconsin products. I think we might as well settle the question once for all whether it ought to be there or whether it ought not.

Mr. Everett: You are supposed to be old enough to know better than to follow the examples of young fellows. You ought to be setting examples.

Mr. Rietbrock: I don't know. The more I learn the more I know that I don't know much, and I find also that the knowing men are at variance with their ideas of what is just right. I think I do know what Governor Hoard would say about this. I think he would say that you should have such conditions in your barn that you can have it there; that it is your business to keep your barn at all times sweet and clean; it is your business to have your barn ventilated so that the cow, when she is making her milk, will produce a good article. I think that is what he would say, because it is not only when you take the milk away from the cow and put it into the separator, that that milk may become contaminated, but during all the time that the cow is feeding and making the milk, getting herself in condition to deliver it out of her udder, she is bringing it in connection with the air through breathing processes.

Mr. Jones: It would simplify the matter to find out what we mean when we are speaking of a separator. The frame

work of my separator sets in the barn the year around, but no part that comes in contact with the milk. The can and the bowl and all the apparatus that comes in contact with the milk is taken out of the separator immediately after the milk is skimmed, taken away from the barn and kept away until it is to be used again for skimming. We have endeavored to make the highest priced butter for several years, and I think that my wise brethren are doing just as we do, leaving their framework in the barn.

Mr. Corneliuson: We are told that in Holland the barns are kept so clean that the kitchen and household utensils are kept right there, and I think where a barn is kept so clean that you would be willing to have your dishes there, there would be no objection to having the separator in the barn; but the fact of the matter is that the majority of barns are not so built or ventilated, nor are they clean, and the separator standing there from one milking to another is subjected to contamination, dust and barn odors which will necessarily contaminate the milk.

Mr. Rietbrock: Do I understand Mr. Corneliuson to say that you do not condemn the practice of leaving the separator in the barn, that is, all the utensils connected with the separator?

Mr. Corneliuson: Yes, lots of them do that.

Mr. Rietbrock: That is a thing that I think every clean man will condemn, but the frame work is left in very many good barns and where people make a first class product. Of course there is a good strong distinction to be drawn there.

Mr. Corneliuson: When they take away the separator bowl, that of course does away with considerable objection. Nevertheless, when you separate in there, unless the air in the barn is clean, the cream will be more or less contaminated.

Mr. Everett: Isn't it possible for the average dairyman to partition off nicely and tidily a separator room in his barn, in which the work of separating may be done in a cleanly manner?

Mr. Corneliuson: Yes, that could be very easily managed in most places.

Mr. Jacobs: In cold weather, however, you are going to lose the warmth of the barn, and it is quite a serious proposition to run a separator unless you have some kind of heat, either artificial or from the cow stable. It seems to me the right proposi-

tion is to make the barn so that it is a suitable place. Now, in regard to this question of contamination. I have found some separators that were contaminating the barn, instead of the barn contaminating the separator. The handling of the farm separator needs a great deal of attention. I do not think there is any other tool or any other process that is more abused in this state than the farm separator.

The Chairman: I have visited within a week, and you all know it has been very cold, a barn where the floor was frozen with filth an inch or two thick, while the separator itself was in first class condition, excepting the man said he had trouble to run it when it was cold. Another barn I was in, the separator did certainly contaminate the barn, it was filthy. Milk was spilled on the floor and oil from the frame of the separator, the whole business was simply filthy. What Mr. Corneliuson says about keeping dishes in the cow stable, while it may sound a little too idealistic, at the same time is getting very near the truth. Unfortunately, we cannot talk a great deal about such barns as Mr. Rietbrock and Mr. Scribner describe, but must talk about the average farmer's barn and try to induce the average farmers to keep their barns in a different condition than that they do now. Mr. Corneliuson, what would you consider an ideal cow stable?

Mr. Corneliuson: Well, I should consider an ideal barn one that is built so that it can be conveniently kept clean and the air renewed about once every hour, every two hours at least.

Mr. Scribner: It does not necessarily need to be an expensive barn.

Mr. Corneliuson: No, I do not think there is a great deal more expense attached to building a barn properly than building it improperly. It is simply a question of a little forethought and time.

Mr. Jacobs: Won't you name a few of the essential points of a good barn, easily cleaned?

Mr. Corneliuson: It should have a good floor, one that the liquids from the manure will not leak through and get in under the floor. A good cement floor, I think, is about as good a floor as you can get. Then it should have a proper system of ventilation. I think the King system of ventilation is consid-

ered by all practical men to be about as good as there is. Of course there should be plenty of light, plenty of windows.

The Chairman: The fact remains that almost everybody when they come to build a barn, if they put two windows on each side and one on each end,—and the upper side, if it is a basement barn, doesn't have any in it,—they think they are doing all right, and that it would cost more to put more windows in. If they would stop to figure out, they would find out that windows do not cost any more than double boarding.

Mr. Goodrich: There is one point in favor of the farm separator that has not been mentioned here, and that is that the skim milk can be fed while it is new and warm and sweet to the calves and the pigs, and it is very much better than the skim milk that is returned from the creamery. I think the extra value of the skim milk will more than pay for the extra work of skimming the milk on the farm.

The Chairman: The extra work of skimming the milk on the farm is not as much work as to hitch up and go to the creamery.

Mr. Goodrich: The cream has to be taken to the creamery just the same, whether it is with the milk or not, but of course it is a great deal less, only about one-eighth, so that when we skim it on the farm, the cream gatherer can take eight times as much, and of course that reduces the cost of transportation. I believe it is possible to make just as good butter from farm separators as can possibly be made where the whole milk is delivered, if the proper care is used, but where the whole milk is delivered, the patron is sometimes more particular, because he knows that the buttermaker cannot use sour milk. Unfortunately, he knows another thing, and that is that the buttermaker can make butter out of sour cream, and so he doesn't take even the same pains. The idea of grading the cream is all right, but who is going to grade it? Can you get cream haulers that are good enough judges and are honest enough to be trusted to grade it? It certainly ought to be graded, because you see when the gatherer takes twenty pounds of cream from Mr. A and fifteen from Mr. B and forty from Mr. C and the cream of one of them is poor stuff and they are all put in together, that poor cream contaminates the whole lot. It is very hard, indeed, as I know, to get a cream gatherer that knows

enough or will exercise enough judgment to grade cream. They worked on that plan at the West Salem creamery for several years; they had two vats, one containing the first quality and the other they called the "stink" vat, where they put the poor cream. This cream was churned and marketed separately from each vat, and that from the poor vat was sold for what it would bring. Of course nobody wanted to get into the "stink" vat; they felt it was a disgrace, besides being a losing proposition. That worked very well for a while, but I understand they have had friction there now. I don't know what is the matter, but I mistrust it was owing greatly to the fact that they could not get cream gatherers that would use good judgment enough. Can you suggest anything on that line, Mr. Corneliuson?

Mr. Corneliuson: I know of factories in this state that have this plan, that each patron sends the cream that he delivers in his own cans, and wherever that is done the buttermaker or one of his helpers, samples the cream, and while he is taking the sample for that test, it is easy at the same time to take a sample for the acid test and also examine it in other ways. But where they have to rely on the hauler to do this work, of course it would necessitate that he understand the work and will perform it properly, and I can readily see that that would be a very difficult arrangement to make.

Mr. Emery: This Association has, from its beginning, stood for dairy progress; it has stood for high ideals in this whole field of dairy work; and it occurred to me, when Mr. Corneliuson spoke of the necessity of the barn being kept in as clean a condition as any other place where human food is prepared, that is probably the right ideal for all dairymen to have and the ideal that this Association ought to promulgate. Milk and cream are, par excellence, human foods, and the stable is the place where it is manufactured, and if we can get this as our ideal, although it may at present be in advance of our practice, it is a good thing to remember that is a place where human food is being prepared, and that, therefore, the necessities of the case are such that the barn should be kept just as clean and the air just as wholesome as any other place where human foods are prepared. I believe that is an ideal we should strive to attain just as fast as it is possible for us to attain it.

Prof. Farrington: I believe Mr. Goodrich has struck the right note in speaking of the difficulty of procuring proper cream haulers, who are intelligent enough and honest enough to inspect cream. If that were possible, you could have three cans on the cream hauler's wagon, each can containing cream of a different grade, though of course, you would have to depend even then on the cream hauler's judgment as to which can each patron's cream should go into. But this other system that Mr. Corneliuson has mentioned is something, it seems to me, more practical. We have talked and thought about it a good deal at the dairy school, have compared notes and it would seem that the best way for putting our preaching into practice is for the cream hauler to have on his wagon a box large enough to hold a sufficient number of pint cream bottles, so that he will have one for each patron, and as he goes to each patron's farm he takes perhaps half a pint of that cream and puts it into this bottle, which is labeled with either the patron's name or number. Then that bottle is protected in the summer and in the winter from being too warm or too cold, so that the cream will arrive at the factory in about the same condition that he received it at the farm. Then some one at the factory who is interested in the quality of the product will have a chance to inspect the cream of each patron in practically the condition it left the farm. It seems to me that is a practical way of grading cream. Of course that pint of cream is not mixed with the other until the man at the factory has had a chance to inspect it, and by inspecting it he can find out about the average condition of the cream at the different farms and he can instruct his hauler as to which class he puts each particular patron into.

The Chairman: He can grade his patrons all right.

Mr. Jones: I have in mind another point in favor of the hand separator on the farm, and it cost me something to find it out. The papers tell us the number of hogs that are sent into the stock yards in Chicago at the present time that are afflicted with tuberculosis is something like 14,000 per annum, as compared with 4,000 a few years ago. If the patrons of a creamery send their whole milk to the creamery, they get the skim milk back, such as it is, to feed to their hogs, and he is likely to get milk from tuberculous stock and feed it to his calves, which are perfectly free from tuberculosis, whereas, if

he knows his own stock is free from the disease and feeds his milk at home, in a wholesome, warm condition, he will have the best results and without importing into his herd, upon which he has spent years of hard labor and thought and money, a disease that may be very disastrous and run all through his herd. I would not have my milk skimmed anywhere else than on my own farm and feed my own milk to my own calves. I don't want to take the chances of importing anything of that kind onto my place.

Mr. Goodrich: I don't want to drop this question of grading cream. It is not practical to have the cream hauler grade it—set that down. Now, is it practical to do it in the way that Mr. Corneliuson suggests? I have known one cream hauler to take the cream from fifty patrons. That would necessitate fifty cans. Is that practical? Sometimes the patron will have only two or three cows and others fifteen, others twenty. Is it practical? Now, as to Prof. Farrington's method. That seems all right, so far as telling the quality of the cream, but by the time he finds out what the quality is, the main body of it has gone into product and it does not help it for that day. Now, I cannot see any other way to do it than to have an army of inspectors that go to the farm the same as they do in Canada, and see that things are kept up in the right manner to produce good cream. That has been my idea for some years. Prof. Emery knows that I have talked with him about it, and I know that he is enthusiastic over it and we are going to have it if we go to the front, or even get up to where Minnesota is, or a little beyond, and that is the only way we can do it, have a lot of inspectors. It will cost something, and I hope the legislature will have the sense to make an appropriation of $40,000 or $50,000.

Mr. Scribner: I like Prof. Farrington's way because it makes this an educational matter. Here there is something to bring right home to the farmer. He can see for himself the trouble his cream is causing the buttermaker, and he will begin to look around to find out what is the matter. Perhaps he has left something standing in the barn, which has stable odors; perhaps he has not a clean place to store his cream; at any rate, he is on the lookout, and I like that plan.

Mr. Wright: We have gathered cream here, and we get it in

small lots, from three to fifty pounds, according to the season, and it is all done by the gathered cream system. When we started in, we gathered in individual cans, and we soon found out that there were three or four particular farmers that sent us sour cream every day, while others, we could always depend on having it good. Then we changed our plan, and commenced gathering cream all in one can, and let the gatherer sample it. We gave him two kinds of cans and the cream of certain farmers was put in a separate can. After you have been in business a few weeks, you find out who your dirty farmers are and who your clean ones are. We had competition here, there was another company and a good many of the farmers that wouldn't send to us. So we offered them twenty-two cents a pound for butter fat. At that time, butter fat was down to fifteen and sixteen cents. I think that all cream that is gathered in that way should be graded, for good sweet cream there should be a higher price than the other.

Mr. Emery: Having found cases where dirty or poor cream was offered, in your practice did those men get the same pay as the men who furnished good, sweet cream?

Mr. Jones: No, they did not.

Mr. Emery: That is one of the hard problems in the whole cream business. We have so many creameries and so many cheese factories in this state, and the competition is so strong that the creameries and cheese factories are receiving unsuitable milk, and the people furnishing it are receiving just as much pay for that unclean and unsuitable milk or cream as the man who is offering good, wholesome cream and milk, and that of course is discouraging to the man who furnishes wholesome, clean milk. The problem seems to be a great one, but our dairy industry in this state is a great one, and we must address ourselves in some way to this problem, and it would seem to me that these creamery men and these cheese factory men must be made responsible in some way for the quality of the cream and the milk that they receive; they must feel that they are committing a wrong upon the public when they receive it and manufacture it into human food products. Not only must they feel that, but the strong arm of the law must be laid upon them, as well as upon the patron from whom they receive the unclean milk and manufacture into human food that which is unfit for

human food. The great public has a right to have the food that is placed upon its table clean and wholesome. In every other department of the food business, the man who offers unclean or unwholesome food to the public is held responsible. The backbone of these factory men must be stiffened and I see no such efficient way of doing it as by the strong arm of the law. Now, it is said, and truthfully, that if one man rejects this milk, the patron takes it over to the neighboring factory and it is received there. That is altogether too true. But if we can have a large enough force of inspectors to be located in the different parts of the state so that they may go to a factory and inspect the milk coming in and there find that a large proportion is coming in in a wholesome and clean condition, but that a few of them will stand upon their so-called rights and furnish unwholesome milk—that those men can be restrained; that inspector can say to them "that milk is unlawful milk that is not suitable to be received into this factory to be manufactured into human food." Then if that patron says, "If you don't want to receive it at this factory, I will take it somewhere else," he will be met by this proposition of the law, "If you take that milk to any factory, you will be prosecuted." We need inspectors enough to do that work all over the state, and by an inspector I mean a man who is thoroughly skilled in the creamery or the cheese factory business. He must be a man who understands the business throughout. If he is inspecting cheese factories, he must know the entire process of making cheese and the best methods of making it, all about the technical work, all about every piece of machinery in a factory, and its necessity for being in a state of perfect cleanliness. He needs to know everything connected with the skillful and cleanly making of the best class of cheese; or, if he is inspecting a creamery, the same must be true in regard to the creamery business. He needs to know what milk is; he needs to know all the details from the standpoint of dairy farming; he needs to know what should be the conditions of the barns and the proper feeding and care of the stock; and then, when this milk is received and he has inspected it in the morning and finds it defective, he needs to be a man with spunk enough to say, "This milk is defective," and able to bring a demonstration of it home to the producer. Why, with our inspectors, few as they are, only

four in the whole state, with 3,000 creameries and cheese factories in the state, 6,000 or more places where human food is dispensed in groceries, 2,000 meat markets, where all sorts of mixtures abound unfit for human food, with 900 drug stores where adulterated drugs are being dispensed, to say nothing about places where adulterated liquors are sold, yet this state of Wisconsin has laid this duty upon a commission and in 1889 it gave that commissioner an assistant commissioner, and a chemist, and under the general law of the state the superintendent of public property could put into that office a stenographer and a clerk. Aside from that, until 1903, only one person was added to that commission, while every other department has grown and expanded. It has seemed as though the state of Wisconsin had put a strong rope upon that commission and held it down so that it could not expand to meet the demands of these great industries. The influence of the dairymen in this state has not been heard for the expansion of this work as it has been in other states and in other lines of industry.

These inspectors, of whom I have been speaking, should be men who can go onto the farm and instruct those people how to care for the milk so that a suitable product for human food can be submitted, and if after proper instruction they neglect or refuse to comply, then the strong arm of the law should be laid upon them and the right of the public to have clean and wholesome milk should be preserved through the law. I wish I could show you some of the results of that work of inspection by these few inspectors that we have had going out in this work. Here is a sample, which I show you, of pure and undefiled dung that is being put into this human food, and this is only a single sample of many. I say that the dairy thought and the dairy interest of this state should make itself felt at this session of the legislature that there may be provided a strong and large addition to this force of inspectors or instructors to uplift this great dairy industry, in the interest, not only of the dairyman, but in the interest of the consumers of dairy products.

Prof. Farrington: I am very heartily in favor of everything that Mr. Emery has said in regard to inspectors. There is no doubt whatever but what they would be a great deal of benefit to the dairy interests of the state, and I want to suggest to the farmers and the creamery men that are here one way in

which they can also help themselves. There are 167,000 farmers in this state and something over a million of cows. Now, every factory, either creamery or cheese factory, that receives milk from 100 farmers can well afford to have one man who is an inspector of the farms sending milk to that factory, and if you have a creamery or cheese factory, you hire a man to operate that factory and you expect to pay him something, and you can quite as well afford to hire another man to devote all his time to going around amongst the farmers, helping them in every way, and improving the quality of the milk and cream sent from these farms. That is one employe that every factory ought to have.

FOLLOW YE THE FOOTSTEPS OF THE COW.

Prof. C. L. Beach, Connecticut.

(In introducing Mr. Beach the President said: Prof. Beach is the son of his father, Charles R. Beach, who was the loved and revered president of this Association years ago, and we are therefore more than glad to welcome him, not only on his own account, but on account of the pleasant memory in which we hold his father.)

Prof. Beach: Mr. President, Ladies and Gentlemen: Your chairman has told but half the story, because I also had a noble mother.

In his political economy Walker says, "A people privileged to live on a virgin soil, cultivating only the choicest fields and cropping these through a succession of years without returning anything to the land, can live in plenty if not fare sumptuously every day." But there comes a time, longer or shorter according to the system of robbery pursued, when the returns from the land are insufficient and new land is taken up and the process repeated. The march of our so-called civilization from Plymouth Rock, New Amsterdam and Roanoke to the Rocky mountains has been characterized as "land butchery."

We are all familiar with the agriculture of the south. Year

after year the cotton planter has harvested his crop, sold the lint and left the seed to *rot* about the gin mill. Later, when the value of the seed as a stock food was discovered, thousands of tons were sent to the north, and as much more in the form of cotton seed cake to England and Europe. Slowly year by year the fertility of the soil was removed and the land became exhausted. Then new areas were broken up and the process repeated. The historian recounts the loss to this section of our country by reason of the civil war, and the freeing of the slaves; but I venture the assertion that the south has sustained a greater loss by reason of a most ruinous system of agriculture.

The wheat section of the northwest has moved steadily westward from Wisconsin to Minnesota, from Minnesota to the Dakotas, and from the Dakotas to the Red River valley. During this time the wheat plant gathered to itself the nitrogen, phosphoric acid and potash of the soil, and the land became exhausted. For many years, the offal of the flour mills, containing the larger amounts of fertility, was allowed to waste at the tail of the race. Later, these by-products were used as a stock food, and the droppings of the animals returned to the land. As a result, the dairymen of southern Wisconsin recouped themselves at the expense of the Minnesota wheat farmer. A generation later, the Minnesota dairyman restored his depleted fields at the expense of Dakota, and today the whole northwest is drawing upon the fertility of the Red River valley in the form of nitrogen, phosphoric acid, and potash contained in bran and shorts. But it should not be forgotten that this robbing of Peter to pay Paul, while legal and legitimate, is still land piracy.

The ravages of the New England farmer upon the soil are proverbial and of long standing. The results are to be seen on every hand. There are many farms for sale today at less than the original cost of the buildings. Many holdings have been given up, and in the township in which I live, eighty are classed as abandoned farms. Time was when the New England land owner was prosperous, as indicated by the number and size of farm buildings. But the temptation was too great even for the shrewd Yankee, and the wealth of the New England soil has gone to feed the population of the city. Today the land is

neglected because exhausted. The young men and women of the farm are employed in the adjacent mill. It is not unusual to find the head of a rural family driving several miles a day to work in a factory, and engaged nights and Sundays in skinning the farm. And, mind you, this decadency in agriculture has taken place in a section which has enjoyed the benefits of the best markets in the world. There are some who claim that this transference of the brain and the brawn, of the vigor and the virility from the farm to the factory was inevitable. These observers would have you believe that New England would never have been taken up even for a goat pasture if the Pilgrim fathers had landed at the Golden Gate instead of at Plymouth Rock. But I do not believe it. I have seen what was once a part of an abandoned farm in Connecticut brought back to such a state of fertility that a single crop from four measured acres filled a 120-ton silo. Professor Henry visited us last summer and remarked that he had seen no corn in Wisconsin equal to that upon our Connecticut college farm.

I dwell upon the decadence of the New England agriculture for there is a phase of it to which I would invite your attention. Fall River, Massachusetts, has $25,000,000 invested in cotton mills, employing 30,000 hands. In July, 1903, the mill owners announced a cut in wages which was accepted by the employes. A year later another cut of 12½ per cent was posted, but the workmen refused to accept it and walked out. The strike has recently been settled, but the employes have lost in wages a greater sum than the reduction for which they are contending would amount to in four years. For seven months the mill owners contended on the one hand that they could not pay in wages as much as formerly and the employes insisted that they could not accept less. In an article on this strike in The Outlook for December 17, Mr. Edward Porritt makes this significant utterance, "My feeling is if a southern dollar is all the Fall River industry can afford to pay its help, the industry had better go where a dollar goes as far as it does in the south in rent and in other requisites of family life." "It is an axiom upon the art of war that an army moves upon its belly, which is a figurative way of stating that obvious truth, that deprived of food men cannot fight." Likewise is should be axiomatic that our army of laboring men cannot long accept a declining wage

in a community where the cost of the necessities of life are constantly increasing. It is worthy of consideration, therefore, whether the decadence of New England agriculture is not a forerunner and contributing cause to a decline in manufactories. With these illustrations in mind, it seems to me that one of the most important questions that confront the farmer today is the preservation of the fertility of the soil.

The amount of the principal elements of fertility removed from the soil in products sold from the farm and the amount returned in the manure will depend upon the system of agriculture practiced on the one hand, and on the other to the methods of handling the droppings of the animals. The difference in the balance in income and outgo of any two systems may seem small and insignificant in any one year. But the differences in the sum of the balances for a period measuring the active life of an owner, say 20 years, are startling enough to command attention. I wish to call your attention to the advantages of dairying as a means of preserving and acquiring soil fertility.

1. FERTILITY REMOVED IN PRODUCTS OF FARM.

When the products of the farm are sold in the form of hay, potatoes, corn or barley, the larger amounts of fertilizing ingredients are disposed of also, but when the sales are in the form of animal products, then relatively smaller amounts of fertility are removed from the farm. The following table shows the amount and value of fertility passing off from a farm in different products for a period of twenty years.

TABLE I.—*Manurial value of products of farm of 80 acres for 1 year and 20 years.*

	Yield per acre, lbs.	Pounds per ton.			Value one year.	Value in twenty years.
		Nitrogen	Phos. acid.	Potash.		
Meadow Hay	2,000	20	8.2	26.4	$408 00	$8,160 00
Potatoes	7,500	7	3.2	11.4	561 00	11,220 00
Wheat straw	800	11.8	2.4	10.2	.....	.....
Wheat grain	1,200	37.5	15.8	10.6	455 00	9,094 00
Corn	1,680	33.0	11.8	7.4	454 00	9,072 00
Beef	160	53 2	37.2	3.4	75 39	1,507 00
Milk	1,562	10.2	3.4	3.0	130 62	2,612 00
Butter	62.5	2.3	1.38	.46	1 16	23 00

The above table shows that 80 acres in hay, yielding one ton per acre, would remove in one year fertility value to the amount of $408. If it was possible to sustain this yield for a period of twenty years the fertility value in the crop would amount to $8,160.00, or a sum equal to the worth of the land at a valuation of $100.00 per acre. In a similar manner potatoes, yielding at the rate of 125 bushels, would remove in one year $561 of fertility and in 20 years $11,220. Wheat yielding 20 bushels of grain and 800 pounds of straw would remove $455 of fertility in one year, and in 20 years $9,094. Corn yielding 30 bushels per acre, would remove in one year $454 of fertility and in 20 years $9,072. If the four crops were grown in rotation and for equal periods $469.50 of fertility would have been removed on the average in one year and $9,390 in 20 years.

If the farm had been devoted to beef production, and the assumption be made that the 80 acres would support 35 animals from six months of age until sold as feeders one year later and making a gain of one pound each day, then the amount of fertility passing off each year would amount to $75.39, and in 20 years to $1,507.

If the 80 acres would support 25 cows yielding 5,000 pounds of milk each and the product were sold from the farm as milk,

then the amount of fertility passing off each year would amount to $130.62, and in 20 years to $2,612.

If butter was produced at the rate of 200 pounds per cow, the fertility passing off would amount to $1.16 in one year and $23.00 in 20 years.

2. DAIRY FARM MAY ACQUIRE FERTILITY.

With the hay, potato or grain farm, the fertility account shows only an outgo and that a large one. With a dairy farm on the contrary the fertility account shows a comparatively small outgo when milk is sold and an insignificent amount when butter is made and the skim milk retained. In addition the dairy farm may gain in fertility by exchange of home grown feeds for more nitrogenous ones, or by the purchase of a part or all the concentrates.

In Table 2 is shown the estimated fertility value of manure per cow, and the gain in fertility to the farm when all the concentrates (except corn in ensilage) are purchased. It is not to be supposed, even under the best conditions, that all the fertility in the droppings of animals will be saved and find its way to the land. It is commonly estimated, however, that two-thirds or three-fourths of the fertility of the food will appear in the manure and may reach the field.

TABLE 2.—*Storrs College herd—Fertility account calculated from feed.*

Per cow per year.						Gain in fertility to farm in 20 years with 25 cows.	
Feed consumed. Lbs.	Fertility in.			Balance of fertility to farm.			
	Feed.	5,500 lbs. milk.	326 lbs. butter.	When milk is sold.	When butter is sold.	When milk is sold.	When butter is sold.
1,754 hay.....	$11.38	.....	.....	.....	.....	.....	.....
8,700 silage.....							
2,030 grain	16.14	$5.74	$0.08	$10.40	$16.06	$5,200.00	$8,031.00

The above account is calculated on the basis of food consumed. During the past five years our herd has consumed per cow, 1,754 pounds of hay and 8,700 pounds of silage, all of which was produced upon the farm and containing $11.38 worth of fertility. Each cow consumed 2,030 pounds of purchased grain containing $16.14 of fertility. The average production of milk per cow per year was 5,500 pounds containing $5.74 of fertility. The average butter production 326 pounds containing $.08 of fertility. The balance of fertility to the farm per cow per year when milk was sold was $10.40 and when butter was sold $16.06. The balance of fertility to the farm at the same rate for a period of 20 years and for a herd of 25 cows would be $5,200 if milk were sold, and $8,031 if butter were sold.

I would not have you infer that I think it a wise plan to place a money value on manure. I would not have any one of you go home and credit your cash account with so much per ton of manure produced during the year or so much per head of stock kept. Such a system of accounts would lead to difficulties and disappointments. It is not necessary to credit your herd and charge your fields with so many tons of manure even though you wish to keep separate accounts of these two operations. Let the manure have no cash value, but turn it over from the herd to the field without charge. In the end the herd will receive proper credit from the increased and lower cost of production of hay, silage and grain.* But the table shows the theoretical value of the manure of a cow per year and the theoretical value from a herd for a term of years. It explains, moreover, how many dairy farms gain in fertility and in yields per acre from year to year, and how an exhausted farm may be recuperated.

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*From an address by F. H. Stadtmuller, before Connecticut Farmers' Institutes.

3. PRESERVATION AND METHOD OF HANDLING MANURE.

It must be remembered, however, that the full advantages of dairy farming will not be secured unless the manure is carefully saved and managed. As Professor Roberts says, "The new idea that the droppings of animals should be as carefully preserved from unnecessary waste as any other product of the farm is hard to put into practice after having for forty years stored the barnyard manure under the eaves upon the steep hillside which forms one border of a running brook." The depreciation in value and productive capacity of many of the dairy farms in New York state, the abandonment of many farms in New England which were formerly devoted to stock raising, illustrate the fact that the dairyman may be as great a sinner as any piratical grain grower. The dairyman of Wisconsin whose farm is not growing more productive year by year by reason of purchased fertility in the form of bran, gluten feed and cotton seed meal, is only "saving at the bung that he may waste at the spigot." In apologizing for the condition of the agriculture in the south, Grady says, that "cotton is a darn fool." In a similar manner any crop taken from the soil may be a darn fool, and if a comparison be made between different classes of farmers, the dairymen may deserve the most censure because the least excusable.

It may not be out of place, therefore, to mention some conditions that affect the value of manure and to state what are considered the best methods of handling.

(a) With the dairy cow, 75 per cent of the nitrogen and 90 per cent of the phosphoric acid and potash of the food appear in the manure.

(b) Of the amount voided, 76 per cent of the nitrogen and nearly all the potash appear in the urine.

(c) Not only does the liquid manure contain the larger proportion of fertilizing ingredients, but they are in the most available form for the plant because soluble. For these reasons the liquid manure should not be allowed to waste and tight stable floors and gutters and the use of absorbents are to be recommended.

(d) The fertilizing ingredients in the manure stand in direct

proportion to those in the food. The manurial value of a ton of cotton seed meal is rated at $28.16; linseed at $21.11; bran at $13.31; barley at $8.18; oats at $7.43; and corn at $6.75. The farmer, who goes into the market to buy concentrates, should consider not only the cost of a pound of protein and of digestible nutrients in the foods offered but the fertilizing value also. Especially is this true of the same farmer who is also a purchaser of commercial fertilizers.

(e) *Manure may deteriorate in value from two causes, (1) fermentation, whereby nitrogen, either as ammonia or in the gaseous state, is set free, and (2) weathering or leaching, which involves a loss of the soluble fertilizing constituents. The loss from destructive fermentation may be largely prevented by the use of proper absorbents and by keeping the manure moist and compact.

The addition of litter, or straw, or the mixing of coarse horse manure with that of other animals, tends to admit the air and hasten decomposition which should be avoided. The loss from leaching may be prevented by storage in water tight pits. The storage of liquid manure separately because it ferments more rapidly is no doubt good practice.

(f) Stable manure may have a value beyond the plant food is contains. First, by furnishing the soil with humus, thus increasing its power to hold water; and, second, by making the soil warmer and more favorable for the growth of bacteria. Third, by inoculating the soil with the proper bacteria which have the power of making the moist matter of the soil more available for plant growth. This latter value of manure may be even greater than that of the fertilizing matter it contains.

In the handling of manure it should be borne in mind that there will be no loss of nitrogen if applied as soon as dropped by the animals, provided it can be at once incorporated with the soil. The plan of drawing the manure out daily, or at least at short intervals, has much to commend it. The Ohio station has shown that when manure was thrown into the open barnyard and permitted to lie there for five months before being drawn had a value of $2.40 per ton. When drawn directly to the field the value was $3.25. When the manure was sprinkled

*Farmers' Bulletin No. 192.

with crude phosphate rock as it accumulated, thus re-inforcing it with phosphorus and possibly at the same time preventing some loss of ammonia, the value was $5.18 per ton.

Professor King has conducted some interesting experiments showing the increased yield of corn and potatoes resulting from the application of 5, 10 and 15 tons of stable manure per acre. The trials are the average of four experiments each of eight classes of soils.

Mean increase in yield of corn and potatoes.

	5 tons manure.	10 tons manure.	15 tons manure
Corn	6.80 bushels	12.63 bushels	15.71 bushels
Potatoes	35.36 bushels	54.72 bushels	63.97 bushels

The application of five tons of manure was attended with an increased yield of 6.80 bushels of corn and 35.36 bushels of potatoes; ten tons increased the yield 12.63 bushels of corn and 54.72 bushels of potatoes and 15 tons increased the yield 15.71 bushels of corn and 63.97 bushels of potatoes. The author concludes "that for general farm crops, moderate dressings of manure, spread frequently, evenly and widely over the farm, will bring larger returns than when it is applied in large quantities to limited areas at long intervals."

4. The dairymen should bear in mind that soil may lose fertility when idle. It has long been observed that soils under continuous cultivation decline in fertility much more rapidly than those in grass. In the former case the fields are left bare a large part of the time and are thus subject to leaching, washing and oxidation. The loss from the latter cause is greater in new land. It was found by the Minnesota Station that when a prairie soil is first brought under cultivation, the humus oxidizes rapidly and that the loss from this source may be more than four times greater than that removed by the crop. But in older soils, the plant food liberated by the bacteria will be lost by leaching unless the field is kept covered by some growing crop. The dairyman is not subject to these losses as is the grain grower, for the pasture and meadow fields of the former

are protected at all seasons of the year. The dairyman should protect his corn land, however, during the fall and spring, keeping it covered with growing rye or some other crop. In this way the losses from leaching may be reduced to a minimum.

5. The value of leguminous crops to the dairyman.

About twenty years ago, a German experimenter discovered that legumes had the ability to appropriate the nitrogen of the air and transfer it to the plant. This is accomplished by bacteria that form nodules on the roots. Thus a leguminous crop instead of exhausting the land of its store of nitrogen may add to it. Land may be improved by the growth of alfalfa, clover, soy beans or cow peas which are plowed under, increasing the humus and nitrogen of the soil. But these crops will best be used when first fed to stock and the droppings returned to the land, thus serving a double purpose.

I have spoken of one advantage of dairying, viz., that when intelligently pursued is should increase the fertility of the soil. If time permitted it would be interesting to speak of the cow as an economical producer of human food, of the advantages of the continuous labor that dairying furnishes throughout the year, and of the advantages of the extra intelligence required to successfully pursue it.

In the Greek mythology it is related that in the search of his sister Europa, Cadmus, almost in despair, sought the advice of the oracle at Delphi and received this laconic message, "Go forth into the world and follow the footsteps of a cow, and where she lies down, build a city." And Cadmus came upon a fresh heifer in following out this injunction and followed her while she plucked the tender herbage and finally lay down, and on this spot Cadmus built the city of Thebes. As a result of this wandering Cadmus introduced into Europe a knowledge of the alphabet and may be regarded as the founder of all European literature. And I believe that the advice of the oracle at Delphi is good advice for the young men of Wisconsin today, and will lead them to prosperity.

Some thirty years ago, my father engaged in dairying in southern Wisconsin. For twenty years or more he followed the footsteps of the cow on his little farm of eighty acres. He took pride in the fact that he had never sold from this farm an ear of corn, a bushel of wheat or a ton of hay, instead a tub or

two of butter a week and now and then a dry cow. A few days before his death he remarked to "Doc" and me, "Boys, I am going to leave the farm but I shall leave it better than I found it. It has never produced as much as it will today." Then let us learn to pray as Buddha taught his followers to pray, saying in the words of the poetry of the Veda, "I charge you, O, my sons, to follow a herd of cows, quaffing the dust raised by their feet by day, and at night lie down and guard them. O Thou mighty Indra, make our pastures wide, give us wealth in cows. For he that hath cows hath delight in cows, for substance is the delight of man, and he that hath no substance hath no delight."

DISCUSSION.

Mr. Emery: We have been in the past growing more appreciative of the necessity of learning how to feed our cattle, that there is a science in it, and that there is an art in it; but Prof. Beach has come to us this morning and has brought to us that further suggestion, this newer truth, that not only is it the business of the dairyman to acquire this wonderful art of the proper feeding of his animals, but he must go much farther, he must learn how to feed the soil, he must learn how to feed the plants, and this new truth is just as important and just as vital and real a truth as the older one. This we need to give our attention to more earnestly, because there is this point in nature; the soil contains these elements that support animal life, but in a condition unfit to be appropriated by the animal. The animal requires, as one of its means of sustenance, carbon. Now, coal is almost pure carbon, and yet no one thinks of feeding his animals coal, it is not in condition to be fed to the animal, it is not in condition to be taken up by the animal and appropriated to animal tissue, but when that carbon is found in certain forms of vegetable life, then the animal can appropriate this material to its own use and can grow.

Again, the refuse, the excrement from this animal, can be returned to the soil and in turn, if properly administered to the soil, if properly fed to the soil, go to increase that other vege-

table life that we now call bacteria and that do their part unknown to the scientist in this reunion between the organized and the unorganized kingdoms of nature, and thus open to us this larger field. Again, comes to us this appeal to our intelligence, warning us that the dairyman must be a man of intelligence; warning us that the great pioneer force in all this world in dairying as well as elsewhere is the force of the human intellect, the force of the human mind; and that, to be successful in this occupation as in other occupations, he must use strenuously this great endowment that God has given him.

Mr. Everett: I notice in Prof. Beach's winding-up statement a point that I would like to impress upon Marathon county dairymen. It has never before been my good fortune to meet Prof. Beach; I know his brother "Doc." very well, and his father, "Uncle Charley," was one of the best and truest friends that I ever had, a man who was always ready, willing and anxious to give good counsel. It was my privilege to be President of this Association some years ago, and I was named for the position by Uncle Charley Beach, and I well remember what he said to me,—'I ought not to nominate you, but I am going to," he said, and I was renominated by him and elected.

I have spent many hours in hotels up in his room listening to his good advice. He was a wonderful man. He made this statement, "I have never sold a bushel of oats or an ear of corn from the farm," and that farm was richer when he left it than when he first took it up. Now, that is a good point for all dairymen to consider. Too many Marathon county farmers are selling timothy hay from their farms, tons and carloads of it. For a good many years I followed the occupation of dairying in Rock county, and it was one of my practices not to sell anything from the farm except the finished product. I considered myself a manufacturer as a dairyman. I sold butter from the farm, as did Uncle Charley Beach, nothing but butter. Everything that was raised on that farm went through a herd of cows, and was sold as finished product, and I got finished prices, while the residue of the foods that grew upon the farm went back to the land and I tell you that farm increased year after year in fertility as did that of Uncle Charley Beach. Stop selling from your lands timothy hay. It will just as surely impoverish you in the years to come as can be; it will rob

your soil of fertility and when that fertility is gone your prosperity is gone. Remember this, that the man who fails to feed his soil will eventually fail to find food for himself and his family.

Mr. Vanderblum: I want to ask something about the feeding value of potatoes as compared with beets, turnips or other root crops.

Prof. Beach: I do not think I could give you any intelligent advice on that, because I have never fed potatoes myself. In the east, potatoes are worth a little too much for stock feed, still sometimes the smaller potatoes can be fed. In Prof. Henry's Feeds and Feeding, I believe he states that ten bushels of potatoes are equal to one bushel of corn in feeding value.

Mr. Meyers: One of my neighbors fed potatoes when they were cheap, and he told me he found it necessary to stop feeding them. His cows fell off, and he doubled the corn ration and still the cows fell off.

Mr. Quaw: I have never fed as the scientists do, but judging from observation, I believe that with a small proportion of beets or rutabagas, potatoes have double the feeding value that Prof. Henry gives in his book, still I would rather put in my potatoes for sheep.

Adjourned till 1:30 p. m.

Convention met at 1:30 p. m.
President Hill in the chair.

HOW SHALL THE FARMER IMPROVE HIS DAIRY HERD? 1. BY BREEDING.

W. J. Gillett, Rosendale.

Mr. President, Ladies and Gentlemen: Any business ceases to become interesting when it ceases to be profitable and the facination usually grows proportionately with the amount of

profit realized. It is so in the dairy business. Increased profit brings with it the incentive for better breeding, closer selection, and better and more scientific feeding and care taking. We can conceive of nothing more discouraging than to be tied to a cow 365 days every year without, at least, some remuneration for the time, labor and close confinement that the business requires and a fair margin of profit over and above food cost of production.

Our dairy farmer never tires of the labor and attention spent upon a first class herd of dairy cows, for the reason that it brings him increased resources, makes him prosperous, lifts the mortgage from his home, and establishes his independence. The time can not be cited when a first class dairy cow could not be a source of profit to her owner—the amount of profit increasing or decreasing, of course, with the fluctuating prices of dairy products and milk producing food stuffs.

"How can the farmer of Wisconsin improve his dairy herd," may, in the case of some herds, be a hard question to answer, but with the majority of herds, it is a very easy one and it may be said that, the subject, sub-divided into three sections, namely, breeding, selection and care taking, effectually covers the ground. They are, indeed, closely allied and in fact so dependent upon each other, that the highest degree of success can not be attained without a close observance of them all.

The better the student of these kindred subjects, and the more thorough the application of the many details involved, the nearer will we approach the highest degree of development and performance in the dairy cow.

That the subject of "breeding" is the starting point and foundation of improvement, and that success, in dairying, depends largely upon the equipment, no one will gainsay.

Having from boyhood been connected with a breeding establishment of pure bred dairy cattle, where beauty and uniformity of type must be considered as well as performance and the development of the milk producing function, it is perhaps but natural that I should look upon this subject from the standpoint of a breeder. My experience in the business, where we have been successful in breeding and developing a herd that for several years back, averaged, for the milk alone, from $90 to $100 per cow per year, aside from the milk required to feed the

calves, has led me to form some conclusions, which may at first seem somewhat radical.

Nature endowed the cow with the milk giving function to the limit of supplying the amount required for the nourishment of the calf, but through the skill of man this function has been bred into certain breeds of cattle to the extent that, they have become distinct dairy breeds; to the extent that the milk giving function has become a fixed characteristic; and to the extent that the amount of milk necessary for the growth of the calf is but a small part of the amount elaborated by the cow. It is therefore necessary, if the herds of Wisconsin are to be improved by breeding, that selections must be made from some of the distinct dairy breeds, where the milk giving function has become a fixed characteristic.

This is an age of specializing and it is also an age of strong competition. We may have a draft horse that can trot a fair clip, but when we line him up in a contest of speed, with animals bred along speed lines, we find we can be dragged along just fast enough, so the other fellows all beat us.

If we were to engage in a bicycle race, we would go in with a bicycle and not with a wheel barrow, but still a wheel barrow resembles a bicycle as much as a beef animal resembles a dairy cow, and so I say, if we seek dairy performance we must start with dairy material in our animals, and if we start with a little of one and a little of the other, we will have neither, of a special characteristic.

I know of no way the dairymen of the country can become possessed of a herd of first class cows except by a series of grading up. Money can not buy them, for the supply is too limited, and so, if the improvement comes it must be through breeding.

I would strongly urge as the first step toward improvement and performing capacity, the selection of a sire of some of the distinct dairy breeds, as by the use of a sire selected from a strong line of producing ancestry, there is not an ordinary herd in the state of Wisconsin whose progeny can not be improved.

Whether improvement is sought in a pure bred or native herd I must say, the sire in the herd is "the brightest star in the milky way"—even more, he is like the full moon whose bril-

liant rays beam out on a clear night, only to bedim the many bright stars that may cluster about him.

The hardest battle I ever fought was years ago to lead myself to pay the sum of $300 for a bull calf for use on our pure bred herd, but I can now say, had I paid $3,000 for this same sire, the sum would not have equalled his worth, nor been commensurate, in value, to the great dairy characteristics he stamped upon his offspring.

From the dairyman's standpoint, "handsome is as handsome does" and performance comes first and is the chief object sought. From the breeder's standpoint, however, performance must not be allowed to obscure type and beauty of conformation. Man's admiration naturally leans toward perfection and so much so, that when symmetry and beauty of conformation are combined with great producing powers in the same animal the value is greatly enhanced. Hence, beyond those points in the conformation of the dairy cow which suggest performance, the breeder must look to the perpetuation of a beautiful type. Not only this, but it is a duty he owes himself and his adopted breed, to fix his standard high and strive for improvement in both form and function.

The ideal form does not always follow function, neither does function always follow form and the two should not be wrongly interpreted. I have about come to the belief that, form is not of greatest importance to insure performance, and certainly it is often a misleading indication of maximum production. Continued breeding along special lines has a tendency to establish strong characteristics. These characteristics may become manifest in either form or function, or both. In illustrating this point, I would call attention to the Short Horn, which was once a prominent breed for dairy purposes. But the time came when breeders turned their attention more to the production of beef, with the result that the Short Horn, with few exceptions, has been barred from the class of profitable dairy animals. Notwithstanding this fact, I fail to see where the structural form of the Short Horn differs materially from what it was in former time. This warrants the conclusion that the milk giving function has been bred out of her, because she is very appropriately classed today among the breeds whose function it is to produce beef.

I have said that, form did not always follow function, nor function always follow form. That can best be illustrated by a comparison of some of the most noted producers of any breed, and such an examination will show structural forms of varying contrasts. There will also be found a similarity, or what would be called a prevailing general characteristic, both as to form and function, but each animal will carry an individuality peculiarly its own, and this individuality is likely to become manifest in succeeding generations and thus the saying, "Like begets like;" but here I must add that in breeding, a strongly established characteristic for generations back seems to conduce to less variation in function than it does to the reproduction of uniform excellence of type.

Atavism, or the recurrence of the original type, is something that must occasionally be expected, and very often in form the progeny will resemble a remote ancestor more than its own sire or dam. This will occur less frequently where, for generations back, selections have been made of animals having a close resemblance to the model structural form. The danger of an undesirable cross anywhere in the line of ancestry thus becomes apparent, as it is bound to crop out and lead to variations.

The breeder should have a fixed purpose in view and though he may err in judgment in the mating of his animals, paramount in his mind should be those principles that tend to conduce to the future development, improvement and usefulness of his subject, which, in my estimation, means beauty of conformation, symmetry, size, with refinement and constitutional vigor coupled with longevity and persistent performance at the pail. They can all be favorably influenced by the eternal vigilance and skill of the breeder.

In breeding the use of two extremes do not stop on a common center, hence, violent crosses are very uncertain and can not be depended upon to produce uniformity.

Performance of ancestry is the best assurance we have of the performance of succeeding generations, likewise is a uniformity of high type the best evidence of what may be expected in structural form.

Fixed characteristics, whether good or poor, are not easily changed, and this is one of the reasons why I have referred to

the sire with so much emphasis. If his blood lines are no stronger than the females of the herd, I fail to see how improvement can be expected, and again, the influence of the sire is spread over the whole herd and his prepotency felt for better or worse.

Continued in and in-breeding has a strong tendency to degeneration, from which size and constitutional vigor and even structural form are made to suffer. Line breeding leads to the intensification of hereditary qualities, with less danger of a decline in size and vigor, and distinct breeding, which I would define as continued outcrossing, if the proper selections are made, tends to promote hardier animals.

When we practice inbreeding for the purpose of intensifying certain desirable qualities, we must remember that we are also just as liable to intensify certain undesirable qualities, the results of which may bring sore defeat to our purpose. Certain characteristic defects are best remedied by an outcross that is perfection at the particular point or points we wish to strengthen.

I have referred to beauty of conformation, which means the outward pleasing appearance of the cow, and which is synonymous, to a certain extent, with the form which furnishes external points indicating performance; and again, when we remember that whatever energy is spent by the cow for the purpose of sustaining life, or for supplying the nervous force for the elaboration of milk, must be compensated for by food taken in at the mouth, the importance of great feeding qualities are suggested.

Strong powers of digestion and assimilation are necessary qualifications for maximum performance, and such powers certainly follow hereditary laws. Endurance generally follows strong digestive powers, hence, as a rule, longevity follows endurance.

I have referred to size with refinement, because in my opinion size is a desirable characteristic of the dairy animal, not because of any additional hardiness in connection with it, but principally because of the enlarged capacity of the machine. I have modified size by having an accompaniment of refinement, for the reason that often with great size is liable to come a certain

coarseness, which in my experience is not conducive to the most economic utilization of food.

Performance may be sub-divided under three heads: the quantity of the milk, the quality of the milk, and the persistence of the flow, all of which are influenced by judicious feeding and care-taking but more so by a special line of breeding. In fact it is a leading question, if quality is not entirely a matter of heredity and even so with quantity.

Every cow is born with a latent capability which lies dormant till, by development through the influence of feed, it is brought out.

I consider it impossible for a cow to be two things—a choice dairy cow and a first class beef animal, because the functions are widely different. Hence, I can not refrain from mentioning, incidentally, the folly of the dairyman attempting, upon the high-priced lands of Wisconsin, to use an animal that is not especially adapted to his purpose.

Nor can I refrain from mentioning that the matter of pedigree should not be allowed to mislead us. If there is anything in existence that will financially grind the dairyman into powder, it is the pedigreed scrub, and certainly there is as wide a difference in the quality of pedigreed animals as between a good cow and an inferior cow, and in some cases in fact where pedigree is but a name. Pedigreed animals are those which, by right of birth, are eligible to registration. It is no distinction of individual worth or merit, and so, while pedigree is misleading in a way, it is, on the other hand, a reliable guide when carrying with it merit, which must be judged from the individual excellence and performance of the recorded ancestry.

This subject is both broad and important and it has been my purpose at this time to treat upon it in a general way, avoiding the many details which must accompany it; and in conclusion I will say if a dairyman starts out today with the resolution and means to purchase a first class herd of cows, he will no doubt be able to procure them, but when he does so he only deprives some one else without increasing the existing number of good cows one single animal, and so it seems the foundation for improvement must lie in a system of better breeding.

DISCUSSION.

Secy. Burchard: I don't want to ask a question about breeding, but I do want to ask a question to bring out more specifically what Mr. Gillett says about the products of his herd. We know that some people tell about what their cows average them in their product, it is $50 or $60, or $100, but that doesn't tell us anything about the market where they sell these products, or how they dispose of them, or other details that make a great deal of difference.

Mr. Gillett: Our market is the ordinary cheese factory, and our prices are the prevailing prices for milk delivered at cheese factories. The result of our herd the past year—which you must take into consideration is a pure bred herd, where all the calves are raised and developed and supposed to be pretty well fed because they are expected to bring pretty good prices—our herd during the past year has averaged nine thousand and something over five hundred pounds per cow, and the average price of the product, as I remember it, is somewhere between 93 and 94 cents a hundred. The herd this past year has numbered twenty cows, of which forty per cent are two-year heifers, ten per cent are three-year-old heifers and ten per cent four-year-old heifers, so it would be hardly fair to say that they were equal to twenty cows, because there were so many young cows among them. On account of delivering milk to the cheese factory, we have to feed more milk to the calves, and we feed them up to five months old, our milk ration is fifteen pounds per day. This would make 450 pounds per month, but it frequently happens that a certain per cent is sold before they arrive at that age, so for the past year I have estimated the amount of milk to be 1,800 pounds per calf, which would bring the average up.

Ex-Gov. Hoard: Isn't that rather a small ration?

Mr. Gillett: That isn't all we feed. We substitute oil meal and add more water to the milk as we think the needs of the calf require. We also get them onto oats and clover hay and a little ensilage as soon as possible.

Ex-Gov. Hoard: If you were feeding skim milk, wouldn't you feed more?

Mr. Gillett: Yes, I would nearly double it.

Mr. Meyers: What average test have you?

Mr. Gillett: I can't say what the average test would be. But our milk ranges at the factory from 3.4 to 3.8, according to the season and according to the condition of the cows.

Ex-Gov. Hoard: In estimating the qualities necessary for the production of a good cow in your breeding, do you not estimate the power and value of the sire to be equal if not greater than that of the mother?

Mr. Gillett: I believe it has a stronger influence. Yes; and if I were to place an estimate on the sire of the herd, I would say he constituted at least fifty per cent if not five-eighths of the herd.

Ex-Gov. Hoard: The average farmer doesn't believe that at all.

Mr. Gillett: I am going to say one thing in regard to the sire. I may be mistaken in this, but my observation leads me to think that a sire not only influences the functions strongly, but he also influences the extremities. What I mean by that is, the head and the ear and the limbs of an animal, the outline. I am going to say further that I believe that I can judge the function of a cow as easily from the forelegs that she walks on as any one thing that constitutes her make-up. I mean the sinewy surface of the leg that shows the development of the veins and is an indication of nervous force.

Ex-Gov. Hoard: I wish you would enlarge on that a little more. You take the farmers of Wisconsin today, the patrons of the cheese factories, the milkers, they are interested in producing good cows, if they only knew it. That average farmer will breed to the poorest scrub sire. He will go and buy a scrub sire for $25 instead of buying a first class good sire that he has to pay $75 or $100 for, and he thinks he is making money.

Mr. Gillett: I never could understand how a man could afford to run a herd of cows for an indefinite time without having something of an income from it, and I am satisfied that there are any number of cows and whole herds in the state of Wisconsin that are running their owners in debt every year, and they are so short-sighted that they fail to see why they are not making money as some other fellows are.

Mr. Quaw: Now, you said that the sire is fifty per cent of the herd. But suppose you had a good, full-blooded sire to use on a common herd of cows of mixed breeding of every kind, wouldn't the influence of the sire be greater than fifty per cent in that case?

Mr. Gillett: Yes, by all means it would.

Secy. Burchard: Mr. President, I cannot think of anything more apt to come in in connection with this subject than to quote a very eminent authority on the subject, eminent from the standpoint of sensible dairying. Of course, these old gentlemen who have been with the Association a good many years know to whom I refer, Mr. Hiram Smith, of blessed memory. In the early days of this Association, it held a convention at Fort Atkinson, in Jefferson county.

Ex-Gov. Hoard: That was in 1874.

Secy. Burchard: Jefferson county then was perhaps further back in dairying than Marathon county is today, and among the questions propounded to Uncle Hiram at that time was this: "Mr. Smith, how would you advise a man to go to work to get up a dairy?" As was sometimes the case with Uncle Hiram, his reply was as direct as it was emphatic, he simply used three words to reply to that question, and those words were, "Buy a bull."

Mr. Taylor: A year ago now, at our annual convention at Platteville, I was asked to take a census of the dairymen in and about Platteville. Because of sickness in my family, I was prevented from making that report, but I remember now one thing that impressed me greatly, and I want to mention it. I visited some fifty or sixty herds. I was seeking the patrons who had taken their milk to a certain factory for a whole year. I only found twenty-three men that took their milk to the factory the whole year, so I had to base my census report upon the twenty-three, but in visiting the herds all around Platteville, I found just three pure bred sires in those herds, and those were Shorthorns, every one of them, not a pure bred dairy sire did I see, not one. And yet those men were inviting their sons and their daughters to engage in the dairy business with them, and asking them to put in their time and energy, devoting them to the dairy business, and not one pure bred dairy sire in that whole section of country. What do you think of that? We

don't have to go back to Hiram Smith's time, but we find in our own time this section of Wisconsin where there are four or five creameries receiving milk from dairy farms and not one pure bred sire at the head of the herd. Now, fellow dairymen, if you have twenty-five or thirty or forty cows, get your thinkers started upon this subject of breeding better than you have, and place a pure bred sire of some of the pure dairy breeds at the head of your herd. Select the best heifer calves from your best cows and keep them as a starter for a better herd. Next year keep every one of those good heifer calves from your good cows from this pure bred sire, and keep that up next year and next year; then you will have to have a new sire, and for the sake of your financial story, get a pure bred sire to use upon those grade daughters of the same breed as the first sire, and if you want advice from a man of experience, go to some one that is breeding in the same line of breeding that your previous sire had, and if you cannot intensify the dairy tendencies in that way, you can't do it in any way, and I don't know of anybody in the state that can't do that much. We want to get you thinking about this.

Ex-Gov. Hoard: In 1876, a man in Jefferson county came to me and said, "I have been trying to make some money out of my herd of cows. They are grade Shorthorn cows and the best I can get them to do is 150 pounds of butter per cow, and I have worked hard." Now, he asked me what he should do, and he said very feelingly, "I can't stand it to work the year around for such small results. Shall I sell off these cows and go and buy dairy cows?" "I think not," I said. "Well, what will I do?" I said, "You want to raise dairy cows, don't you? You don't want to fool away your time with poor cows, you want good cows?" "Yes." "Well, you go and buy the best Jersey bull that you can find—and if you pay a good high price for him, the better—and put him at the head of your herd." He did so; he paid $200 for a very fine, prepotent, strong-blooded Jersey bull. Now, my good farmer friends, I want to show you something. When the daughters of that sire came into milk, at four years of age, his average was 275 pounds of butter per cow. That is what blood did when bred in the right direction.

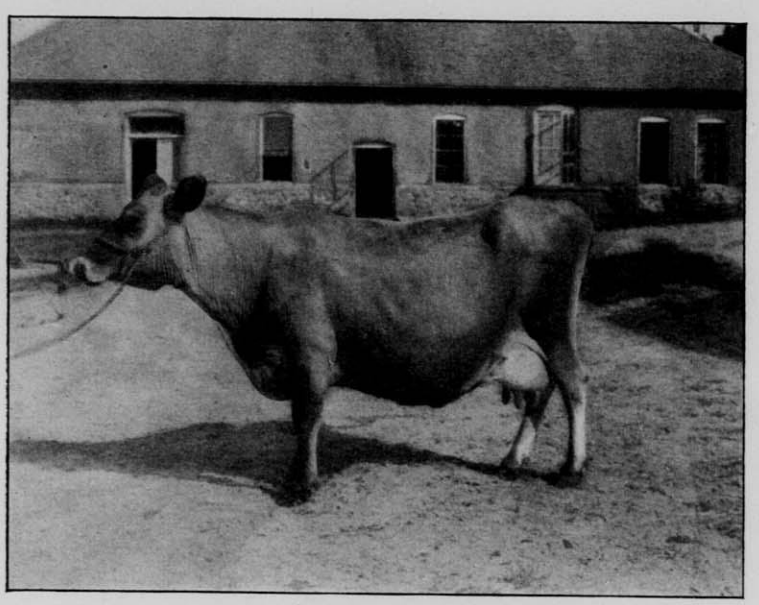
Now, you will hear men say there are dairy strains in Shorthorn cows, and it is true; there may be good dairy cows among the Shorthorns, but, my friends, there isn't a Shorthorn bull in existence that is a breeder of dairy cows. You can't find one all over the state of Wisconsin that isn't as beefy as he can be, coming way down and back from fifty years of beefy ancestors on beefy lines, and that is the kind of breeding that farmers are fooling themselves with all the time, and still wanting to be dairymen, still wanting to get the most money from the creamery or the cheese factory that they possibly can, and at the same time fooling themselves with this idea of breeding for beef and getting milk.

HOW SHALL THE FARMER IMPROVE HIS DAIRY HERD. 2. BY SELECTION.

Prof. C. L. Beach, Connecticut.

TWO STANDARDS OF SELECTION.

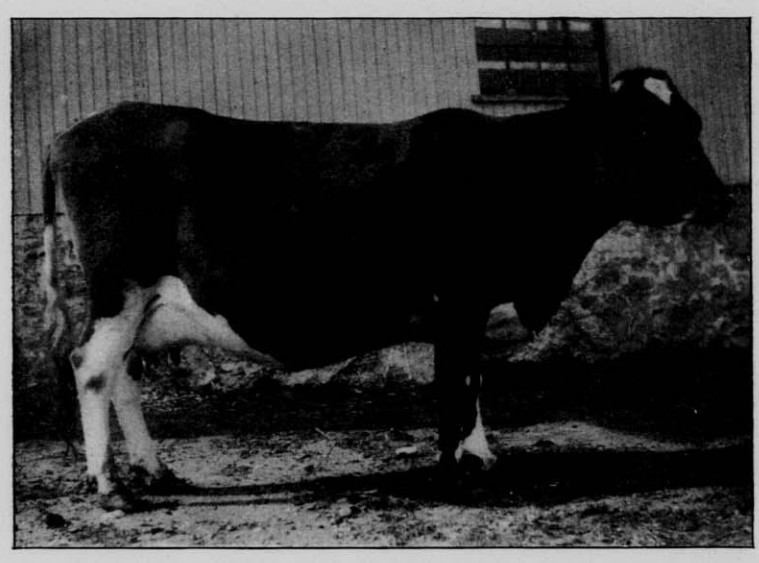
Improvement and uniformity in breeds of livestock is impossible only as the result of the existence of a standard of excellence. This standard may relate to the form or type of the animal or to performance. The former standard is expressed in the score card or scale of points, or from time to time by the breeders at the auction sale, or by the judge in the show ring. The standard of performance relates, with beef animals, to the quality and per cent of dressed meat at the slaughter contest; with sheep, to the quality and quantity of wool at the shearing; with horses, to the speed shown by the runner or trotter upon the track, and in dairy cattle to the amount of milk and butter fat production of the cow. Improvement will be the most rapid, either in the breeding or working herd, when these two standards are recognized, when their causative relationship is understood and when accessions to the herd conform to both.



"BELLE."

Dairy Type.

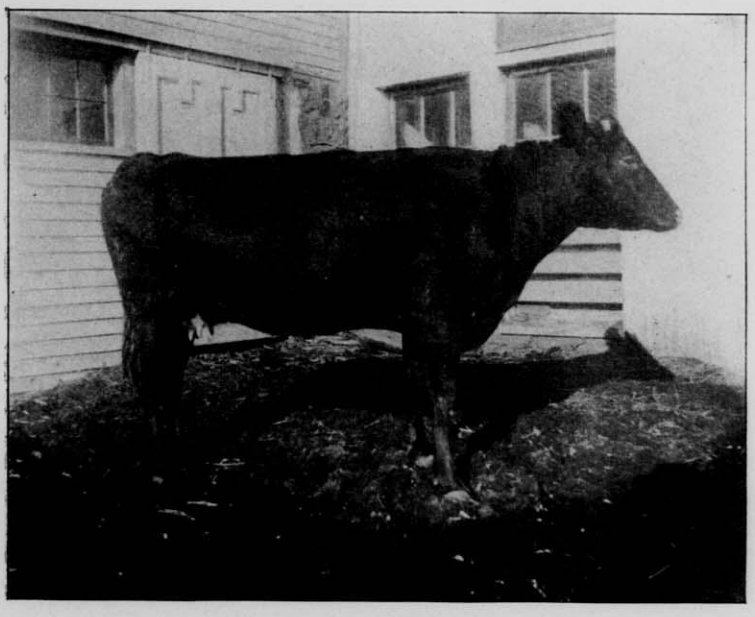
Average, 3 years, 511 lbs. butter, $56.47 profit.



"ROSE."

Fleshy Group.

120 lbs. butter, $13.10 loss in one year.



"DEVON."

Lacking Digestive Capacity.

221 lbs. butter, 8.33 profit in one year.

RELATION OF FORM TO FUNCTION.

Different breeds and species of domestic animals are valuable because of the special development of the function of some organ of the body. Dairy breeds are valuable because of the development of the function of milk secretion. It has been found in practice that certain functions are antagonistic and that their highest development in the same animal is impossible. This is illustrated in the antagonism of beef and milk production, wool and flesh, speed and draft, mental and physical power. On the other hand certain functions are harmonious, as digestion and milk secretion. Experience teaches, also, that the stimulation and training of a function may result in the modification of the organ in which the function is seated. This development and suppression of functions, this interdependence of development, this modification of structure as a result of training, is known as the law or principle of correlation. The value of a knowledge of this law is apparent—it forms the basis of all livestock judging.

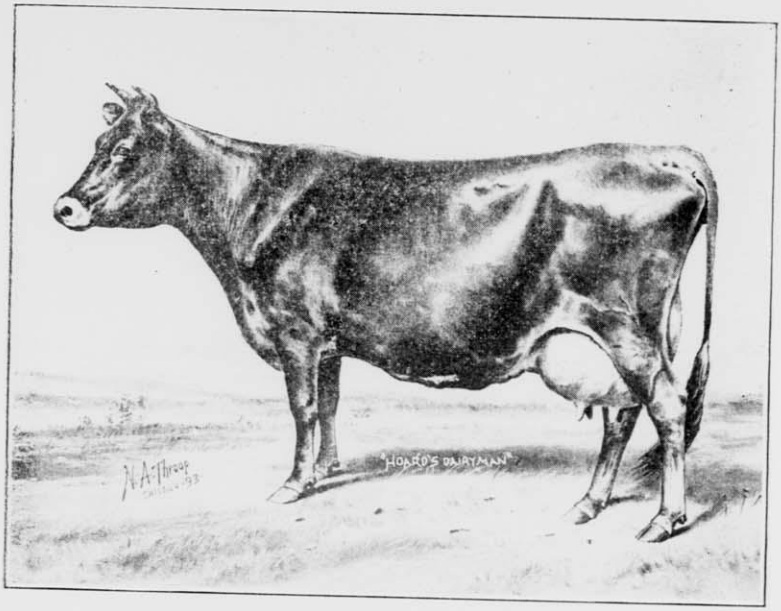
LAW OF CORRELATION AND DAIRY TYPE.

By stimulation and training of the function of milk secretion, the dairyman has modified and increased the capacity of the udder of the dairy cow. More abundant and palatable food has stimulated appetite and increased digestive capacity. Increased digestion and milk secretion has called for and been attended with a larger flow of nervous energy. Later, as the result of generations of training, the demands of the udder have been more urgent than those of the body, and the latter has been depleted of all unnecessary flesh. And so the dairyman may judge of the capacity of the cow for economic production by the development of those organs whose functions are correlated with milk secretion, viz., the capacious udder, the large digestive organs, the well developed nerve system, and the spare, angular, depleted body of the dairy type.

TABLE 1.—*Type of cow and cost of production.*

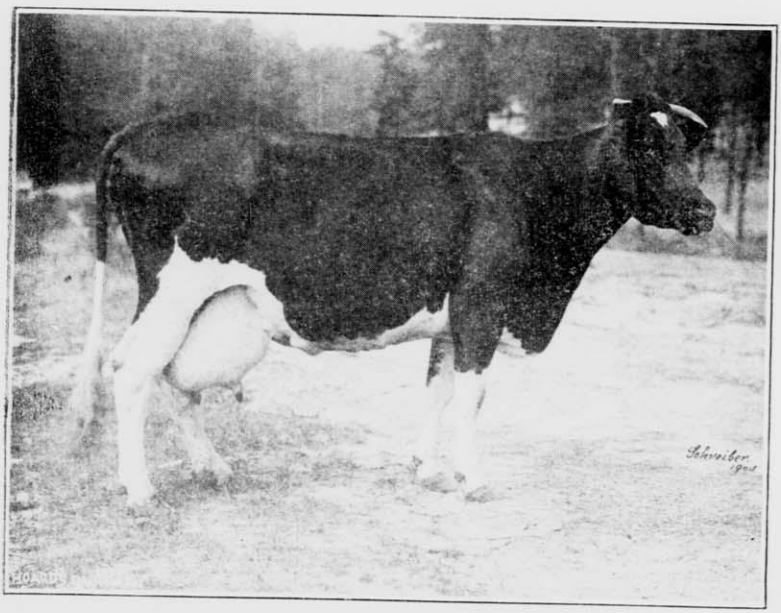
Group.	Minnesota.		Connecticut.	
	No. of animals.	Av. cost of 1 lb. fat	No. of animals.	Av. cost of 1 lb. butter
I. Beef type or fleshy group	3	17.5 cents	4	18.1 cents.
II. Less of beef type	4	15.1 cents.	.....	.....
III. Lacking depth of body	3	14.6 cents.	5	14.9 cents.
IV. Dairy type	12	12.1 cents	16	12.0 cents.

Prof. Haecker of Minnesota made a very close study of the type of the cow in relation to cost of production. A herd of twenty-two cows were divided into four groups, and the average cost of each one pound of fat produced during the year was determined. The Storrs Station made a smilar study upon lines laid down by Prof. Haecker. The results in the table above call for no extended explanation. In the Minnesota herd three animals of the "Beef Type" charged on the average 17.5 cents for each pound of fat produced; four animals of "Less of the Beef Type" charged on the average 15.1 cents; three animals in the group designated as "Lacking in Depth of Body" charged on the average 14.6 cents; and 12 animals of the Dairy group charged on the average 12.1 cents for each pound of fat produced. At the Connecticut Station, four animals of the Fleshy Group charged on the average 18.1 cents for each pound of butter produced; five animals of the group "Lacking in Depth of Body" charged on the average 14.9 cents; and 16 animals of the Dairy Type charged 12.0 cents.



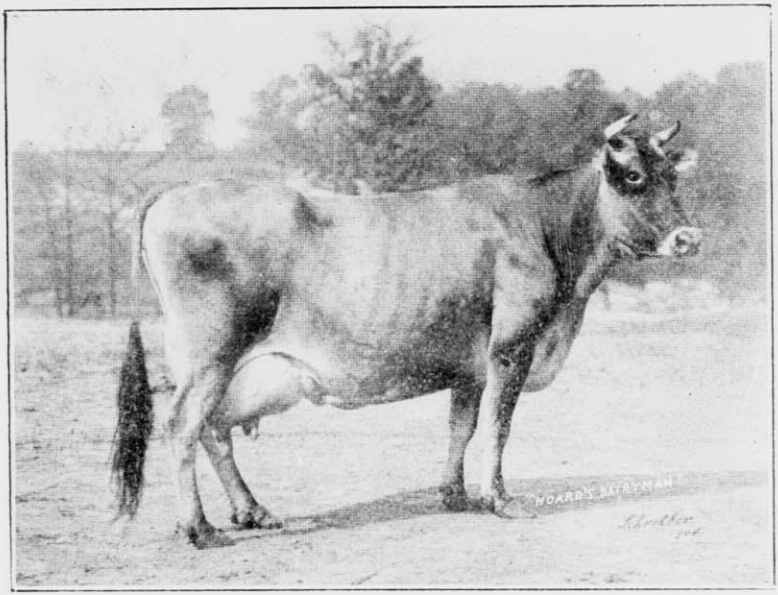
"BROWN BESSIE."

Champion Jersey, Chicago.

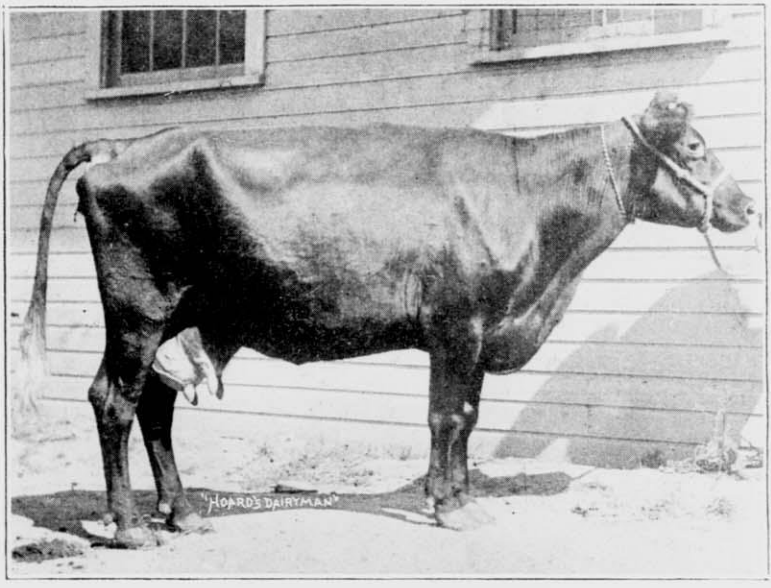


"SHADY BROOK GERBEN."

Champion Holstein, St. Louis.



"LORETTA D."
Champion Jersey, St. Louis.



"16TH BELLE OF TROWBRIDGE."
Champion Shorthorn, St. Louis.

This theory of dairy type is demonstrated again by the similarity of the champion cows in the breed contests of St. Louis and Chicago.

Note the development of the correlated, harmonious functions—capacious udder, large digestive capacity, well developed nerve system, and the spare, angular, depleted body resulting from a suppression of functions antagonistic to dairy performance.

INDIVIDUALITY OF THE COW.

While "type" is an indication, it is not an exact measure of economic dairy capacity. Careful, intelligent and painstaking judgment was exercised in the selection of the herds for the St. Louis breed contest. The table below shows the production and cost of feed of the best and poorest cow of each breed. The difference in cost of feed was for the Jersey, $1.76; Brown Swiss, $1.28; Holsteins, $1.89; and Shorthorns, $0.88; and the difference in the net profit is, Jersey, $23.80; Brown Swiss, $8.02; Holstein, $27.99; and Shorthorn, $30.61.

These figures show that judging by type or signs is not an exact science and should be supplemented by records of performance.

TABLE 2.—*St. Louis breed contest.*

Best and poorest cow of each breed.

Breed.	Yield of milk.	Yield of fat.	Cost of food.	Profit.
Best Brown Swiss	6126	209.8	$33.49	$27.77
Poorest Brown Swiss	4618	177.3	32.21	19.75
Difference			$1.28	$8.02
Best Holstein	8101	282.6	36.57	46.02
Poorest Holstein	5659	180.0	34.68	18.03
Difference			$1.89	$27.99
Best Jersey	5802	280.0	31.99	50.52
Poorest Jersey	4653	193.8	30.23	26.72
Difference			$1.76	$23.80
Best Shorthorn	5207	208.0	28.57	32.56
Poorest Shorthorn	2571	101.0	27 69	1.95
Difference			.88	$30.61

The value and importance of an individual account of each animal is illustrated in tables 3, 4 and 5 taken from the records of the Storrs College Herd. Table 3 gives the average food cost and profit of the five best and the five poorest cows in the herd for a period of five years.

The difference in the average food cost of the five best and the five poorest cows was $4.52 in the first year; $14.92 in the second year; $9.86 the third year; $8.07 the fourth year, and $3.35 the fifth year. The corresponding differences in the average profit of the best and poorest was $31.00 per cow for the first year; $49.02 the second year; $28.57 the third year; $30.00 the fourth year, and $22.56 the fifth year.

TABLE 3. —*Difference in average food cost and profit of five best and five poorest cows for five years.* (*20 cows in herd.*)

Year.	Cost of food.	Yield of fat in lbs.	Profit.
1899.			
Five most profitable cows	$56 54	304.2	$26 91
Five least profitable cows	52 02	188.6	4 09*
Difference	$4 52	115.6	$31 00
1900.			
Five most profitable cows	$60 30		$43.27
Five least profitable cows	45 38		5 75*
Difference	$14 92	213.0	$49 02
1901.			
Five most profitable cows	$53 24	375.3	$44 25
Five least profitable cows	43 38	217.2	15 68
Difference	$9 86	158.1	$28 57
1902.			
Five most profitable cows	$59 52	376.2	$43 71
Five least profitable cows	51 45	236.6	13 71
Difference	$8 07	139.6	$30 00
1903.			
Five most profitable cows	$59 46	365.5	$40 23
Five least profitable cows	56 11	268.9	17 67
Difference	$3.35	96.6	$22 56

* Loss.

As a result of a weeding out of the unprofitable cows, the average yield of butter increased with corresponding gains in profit and net profit

TABLE 4.—*Showing gains in yield of butter, gains in profit and net profit for period of five years.*

	1899.	1900.	1901.	1902.	1903
Number of cows in herd	20	25	21	20	19
Yield of butter, lbs	284	317	327	342	365
Cost of food	$55 21	$53 87	$47 79	$54 06	$57 10
Average profit per cow	11 16	20 70	29 15	26 53	28 73
Average net profit per cow	*1 23	11 32	17 35	16 84	21 64

* Loss.

During the five years covered by the above records, the variety and amount of food and the care of the herd have been much the same. The increase in net profit from $1.23 loss in 1899 to $21.64 in 1903 must be attributed to the weeding out of unprofitable cows and the selection of animals better suited to dairy purposes. The average cost of animals added to the herd since 1899 was $42.50.

The possibilities of substantial profits from a well selected herd are shown in Table 5. The records of the 50 cows for 103 lactation periods are grouped according to amount of profit into five divisions.

TABLE 5.—*Difference in net profit from cows making best and poorest records.*

	Total net profit.	Individnal net profit.
23 poorest records	$303 03*	$13 17*
20 fourth best records	111 56	5 67
20 third best records	292 57	14 62
20 second best records	439 26	21 96
20 best records	788 06	39 40

* Loss.

TABLE 6. - *Size and dairy capacity.*

No. of Animals.	Av. weight. Pounds.	Cost of food.	Yield of fat. Pounds.	Profit.
25 Jerseys	925	$56 97	315.7	$29 68
25 Jerseys	785	52 67	297.3	28 93
Difference	140	$4 30	18.4	$0 75

Table 6 shows the difference in net profit of a group of Jerseys weighing 925 pounds and a group of the same number weighing 785 pounds. It is generally considered that a large cow should be more economical than a small one, other things being equal, as the relative maintenance needs should be less. In this comparison there was a difference of $0.75 in the average profit for one year and in favor of the larger cows.

TABLE 7.—*Quality of milk and butter production.*

No. of Amimals.	Av. per cent of fat in milk.	Yield of fat in milk. Lbs.	Profit.
28 Jerseys	4.85	306.65	$29 27
28 Jerseys	6.31	306.35	29 32
Difference	1 46	.30	$0 05

Table 7. It is generally considered that cows giving rich milk should be able to produce butter fat more economically than those producing milk less rich in fat. In the above comparison, however, the quality of milk was not an index to productive capacity. There was an average difference of only $0.05 in the net profit for one year and 0.3 pound difference in fat production of two groups of Jersey cows, one of which averaged 4.85 per cent of fat by the Babcock test and the other group 6.31 per cent.

TABLE 8.—*Quantity of milk and butter production.*

No of Amimals.	Yield of milk. Pounds.	Yield of fat. Pounds.	Profit.
28 Jerseys	6,608	344.8	$37 15
28 Jerseys	4,632	268.7	21 45
Difference	1,976	76.1	$15 70

Table 8. The most profit was made from those cows giving the most milk regardless of quality. Twenty-eight Jersey cows averaging 6,608 pounds of milk per year produced a profit of $37.15; while 28 Jersey cows averagng 4,632 pounds of

milk in a year made a profit of $21.45, or a difference of $15.70 in favor of the larger milkers.

SELECTION OF A DAIRY SIRE.

The selection of a sire is a most important factor in the upbuilding of a dairy herd. It is an old adage that "the bull is half the herd," and this is the case when neither parent is possessed of marked impressive power. But the sire is usually more purely bred and possessed of greater individual vigor and in a majority of cases has a greater influence on the offspring than does the female with which he is mated. Greater care should be exercised, then, in the choice of a male than a female, because the progeny of the former is more numerous, and because the sire is often the more prepotent. To improve the dairy qualities of a herd by breeding, the selection of a sire should be made from one of the established and recognized dairy breeds. The choice of an individual may relate to pedigree, form or type, and prepotency.

PEDIGREE OF PERFORMANCE.

A pedigree is a register of ancestors. A pedigree of performance includes the pedigree of lineage and in addition facts in regard to the records of production of the individuals mentioned in the pedigree. It has been stated that the corner stone of the breeders' art is the law "that like begets like." This law of transmission relates to structure, function, habit, constitution, disease, and in fact to all features of the organization. Usually the offspring inherits the qualities of the parent, but frequently the character of some ancestor becomes dominant in the offspring, and the quality of the parent becomes latent. It should be borne in mind, also, that qualities peculiar to one sex are transmitted through the other, i. e., the functions of a family noted for dairy production are transmitted through the male members of that family. For these reasons a study of pedigrees becomes important as it enables the breeder to estimate the probabilities of transmission.

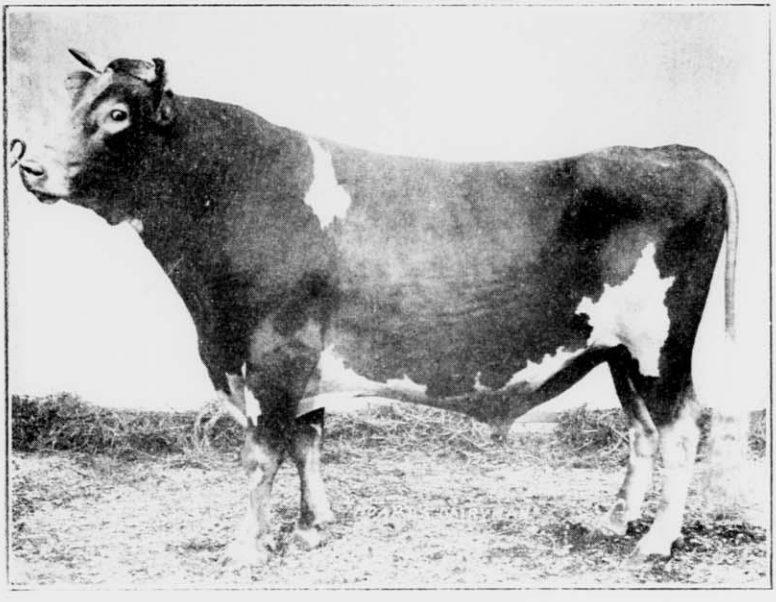
PREPOTENCY.

Prepotency is the power which an animal has of transmitting its own qualities. Dairy prepotency is the power of an animal to transmit dairy qualities. The influences that tend to produce or insure prepotency in the individual are purity of blood, duration of such breeding, in and in breeding, strong constitution and vigor. The purity of breeding, the duration of such breeding, the closeness of relationship in the ancestory, all tend to strengthen prepotency in the individual. A knowledge of these qualities we may gather from the study of pedigrees. But prepotency is indicated by vigor, style, alertness and resolute appearance of the individual. "A dull sluggish spirit and action is indicative of a lack of dairy prepotency." Note the bold, masculine appearance, indicative of impressiveness, of the two Champion bulls, Merry Maiden's Third Son and Prince of Rosendale.

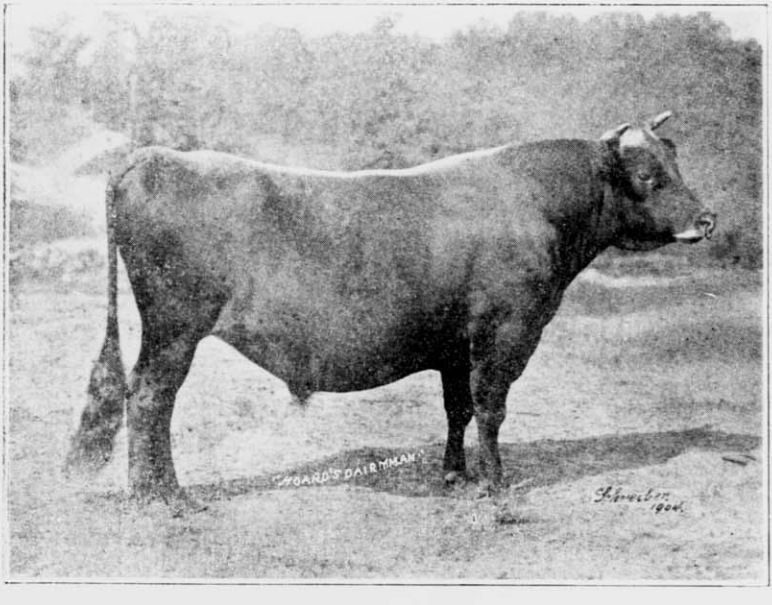
Prepotency in a sire is not assured until proven in his progeny. Uniformity and excellence in the offspring is the supreme test of prepotency. All the requisites may be present that tend to assure this impressive power and yet it may be lacking. For this reason a young sire should be used cautiously and an aged sire whose qualities have been proven should never be discarded until past the period of usefulness.

FORM OR TYPE OF BULL.

The type of a dairy bull is well shown by a study of the cuts of the champion Jersey and Guernsey bulls at St. Louis. Both show the large bowel indicating digestive capacity; 2nd, the thin, incurving thigh, and high cut flank, which if transmitted to their female offspring insure ample room for the development of the udder; 3rd, the eye, head and neck and front quarters show masculinity which, aside from pedigree, are the best indices of prepotency; 4th, the absence of unnecessary flesh indicative of dairy breeding which should insure economy of production.



"PRINCE OF ROSENDALE."



"MERRY MAIDEN'S THIRD SON."

RESUME.

Improvement in the dairy herd will be the most rapid when attention is given to the following considerations:

1. Accessions to the herd should conform to "dairy type" (Table 1).

2. Records should be kept with each individual of the herd and the unprofitable animals weeded out (Tables 2, 3, 4 and 5,)

3. Size does not seem to be an important factor in dairy performance (Table 6).

4. On the average, among butter breeds, the large producers of milk will make the most profit from the production of butter (Table 8).

5. The quality of milk secreted is not as important a factor as quantity (Table 7).

6. Heifer calves out of the best cows and by a dairy sire should be raised to replace the herd.

7. The dairy sire should be selected because of the excellence (performance) of his ancestors; he should have the dairy form or type and should in addition show prepotency in his style and action.

DISCUSSION.

Mr. Taylor: The Professor has told us that the first evidence of a bull's prepotent power is in his external appearance. Now, what is the next evidence?

Prof. Beach: Will Mr. Taylor answer that question himself?

Mr. Taylor: The next evidence can be seen when his calves are six to eight months old. If the bull calves are masculine, rugged, vigorous, strong fellows, and the females are feminine, cowy, motherly-looking heifers, then you have positive evidence that the sire's prepotency is of the right quality.

HOW SHALL THE FARMER IMPROVE HIS DAIRY HERD? 3. BY FEEDING.

Prof. G. C. Humphrey, Madison.

In addressing the Association on the third topic of the symposium so uniquely arranged for our consideration, I trust that at least a few points can be made which shall lead to a full discussion later. I feel that it is only in this manner that justice can be done a subject so important in our study to improve our dairy herds. The subject of feeding dairy cattle is one that has many phases and will never cease to be a subject of great interest and furnish wide scope for discussion, but in the discussion which follows, I trust we may confine ourselves to the most practical phases of it and aim to accomplish the most good for the dairy cattle of the state as they exist under the supervision and ordinary management of the Wisconsin dairy farmer.

I would not have you divert your minds from what has been brought out in the discussion of the preceding topics, for all that relates to breeding and selection of dairy animals is essential in laying a sure foundation, which we are dependent upon for our success, and without which our efforts will prove in vain. However experienced the feeder, if his animals have not been bred right and his selection has been unwise, he never can accomplish the end he may have in view. Having laid a sure foundation by wisely selecting and breeding his animals, the feeder is ready to carefully consider the subject of feeding. Feeding successfully is a much more tedious process than selecting and breeding. It requires constant effort and the closest attention to detail, in order for one to be most successful. It means thoughtfulness at every act of placing feed before animals, and considerable thinking between times.

THE NATURE OF THE IMPROVEMENT NEEDED IN OUR DAIRY HERDS.

There is little need of talking improvement until men are convinced that improvement is necessary. Men are unable to see

where it is worth while to go to all the expense of systematically feeding their herds until they are brought to realize the need of such work. The first fault to be found in a great many herds of the country is a failure to feed the right kind and a sufficient amount of food to insure a chance of cows being profitable. Too many cows are receiving merely a maintenance ration, poor at that, which does not permit their making any profitable production, however good they may be as dairy individuals. In another case men are feeding extravagantly and wasting enough feed to keep fifteen cows where they are keeping ten. Again, in many cases men are endeavoring to grow young stock, with which they expect to replace the older members of the herd, and the system of feeding these young animals is to be severely criticised. Calf feeding in too many cases is a side issue.

Three things every dairyman must do in feeding if he is to make improvement in his dairy herd and dairy operations. First, he must aim to grow young animals into strong, healthy individuals, which will improve his herd as they take their places in the herd and replace others. Second, he must feed enough of the right kind of feed to stimulate and encourage every animal in his herd to do all her capacity warrants. When her capacity has been thoroughly tested and she fails, she must be discarded and replaced by one more promising. In the third place, the dairyman must avoid feeding beyond the limit of the cow's capacity for converting feed into milk. We often find cows consuming much more than they are paying for at the pail, and men who are not watching this closely are not working toward improvement in their feeding operations.

GROWTH AND NATURAL DEVELOPMENT.

It will pay every good dairyman to raise the heifer calves from the best dairy cows of his herd, and by so doing his chances are much better for improving his herd than they are where he depends upon buying new cows to replace his old ones. It is almost impossible to go out and buy the best cows. Men will sell you the poorest and reserve the best, as a general rule. This rule has few exceptions, especially where the practical dairyman is doing business and paying from $40 to $60 per

head for his cows. Few dairymen can afford to go out and buy cows to replace old ones in the herd when they have any chance whatever to save and raise the calves from their best cows, and buy good bulls which should be used in every instance. It will pay the dairyman to grow his cows, providing they are grown in the right manner.

In developing any of our domestic animals, growth is a natural thing on their part the same as it is in every living organism, be it plant or animal growth; it cannot be encouraged too much. Every animal is entitled to the privilege of making a maximum amount of natural growth, whether that growth is in the direction of what we may term a heavily fleshed form, a medium sized form, or a spare fleshed form. As to what the form shall be after proper development, will be largely determined by the ancestors or progenitors of the animal in question. For example, some calves will make a maximum growth and have a tendency to develop a form spare in flesh; others will have perhaps more size and considerable more flesh, and again others will have still more flesh, which covers the framework of the body and gives the well rounded form, so well adapted for the production of beef.

Whatever the growth may be, it has to be made between the day of birth and the time of maturity, and is due to a given amount of feed which, for a maximum growth, must be liberal and of the right kind. The suppliance of the proper kind and amount of feed, or the lack of this proper supply, will be in evidence when the calf reaches maturity. Too often it is true that the supply has been inadequate, and the result is indicated by a lack of size and natural flesh and development of vital organs, which tend to weaken the strength and constitution and render the animal less useful in serving its purpose. I am honest in my convictions when I say that I believe that there are too many cows in the country today, too refined and delicate, which in the hands of the practical dairyman are a failure, owing to a lack of size and greater strength of form and constitution, which should accompany every natural growth. There are individuals of every breed that are delicate and a failure for this reason. A great many dairy animals are being developed today with that refined, delicate form which we are inclined to recognize as characteristic of dairy quality, and too often

allow our fancy to judge accordingly, when I believe it is a mistake. The breeder, who is wise, will look well to the feeding, breeding and selecting of his animals to get a stronger and more desirable growth.

Food is one of the chief causes of variation in animals. In the practice of feeding, combined with breeding and selection, it is possible to develop a high standard of excellence, and having once gained such a standard, nothing is more necessary in maintaining it than a sufficient amount of feed. It gets in the best work during calfhood and up to the time an animal reaches maturity. During this period of life an animal was never overfed so long as the food supply had no bad effect and encouraged a good, thrifty growth. An animal can be over-fed in the sense that it be given feed to satisfy a greedy appetite; to the extent that it will become over-loaded one day, and off feed for the three following days, but starting a calf right and feeding him regularly day after day such kinds and amounts of feed that will develop a maximum growth will never result in harm.

A general rule for successfully raising calves is hard to give. In general, cleanliness is one of the first things to be observed. It is not natural for a calf to grow up successfully where it is confined to filthy, dark pens, and has to depend upon milk and water and other feed from soured, filthy buckets and troughs. Few men, perhaps, are a success in raising good calves. The attention to the best welfare of the calf seems to be as essential as the feed itself and will bring results that can be had in no other way. Such attention sees to providing the proper amount of milk at the right temperature after the calf is weaned; inducing it to eat a little bright hay and some grain at about ten or twelve days old; and later on, as skim milk is substituted for whole milk, gradually increasing the amount of bran and oats and a little oil meal perhaps, as the calf seems to eat and thrive well. The condition is carefully noted and so far as possible the growth is never allowed to falter. At the age of six to eight months the calf is turned to pasture, if in season, where good grass is abundant. If such pasture is not available, the calf is remembered with a grain supplement that will prevent any check in its growth. Thus by continuous feeding it reaches the state of maturity, strong, healthy, good-sized, and possessed of a good constitution, enabling it to ward off disease

and have the energy and strength necessary for heavy work. Is there any danger of spoiling a bull or heifer calf for dairy purposes by such treatment? No, not in the least, providing the animal is bred right and possesses that inherent tendency called dairy tendency. Without that inherent tendency, any animal is a failure from the standpoint of dairy production; with that present, the stronger and more fleshy an animal is the more useful they will be as dairy cows. They sometimes fail to impress us as strong dairy animals as heifers, but they continue to grow stronger as dairy producers, and in their prime are the best cows the country affords.

DEVELOPING THE DAIRY TENDENCY.

The usefulness of every cow after reaching the state of maturity depends upon the predominating tendency she possesses, whether dairy or beef, and the use that is made of that tendency by the feeder. Every animal is possessed of dual tendency in a greater or less degree, which is evident from the fact that the best of cows will commence to take on a surplus of flesh at the close of their lactation period, providing they are in good health. One of these tendencies, however, usually predominates, and feeding after the heifer has freshened is one of the best methods of revealing which tendency is going to be the predominating one. It can usually be told during the first lactation period, but there are cases on record where animals fail to show their predominating tendency until after their first year, or perhaps second year, as milk producers. In trying to account for this peculiar performance on the part of some individuals, it would almost seem that they were slow in reaching the state of maturity that made them ready for doing the work of a dairy animal.

We find strictly beef animals among dairy breeds, so far as this inherent tendency is concerned, the same as we find strictly dairy cows among some of our more beefy breeds. It is this fact that leads me to believe that the usefulness of the mature cow is determined more by her inborn tendency than by any other factor. I am not sure but the time is near at hand when the score card will have to be revised and our methods of judging dairy cows changed considerably, if we are going to

work the greatest improvement in developing strong dairy cows. Feeding and performance is the surest test we have in determining dairy tendency today, and we are often confused in our judging when we confine ourselves to the score card that describes a form indicative of great performance. If this be true, feeding to bring out the true value of every dairy cow, aids selection and becomes one of the most important factors in the improvement of our dairy herds.

I should be most happy if I were able to tell you just the best system of feeding to bring out and develop all that is possible in a cow which has dairy possibilities in her. If I could answer this question satisfactorily, there would be no farther need of experimentation and investigation along the line of feeding dairy cattle. It would answer the question as to which is the more satisfactory, a wide or narrow ration; it would compound a ration for each dairy cow in the state, and these are things which I do not intend to do. No fixed ration can be given for any one herd. Cows will vary too much, for one thing, in what they require as individuals and at different stages in their lactation period, and the great variety of feeds at our disposal is another thing to prevent our discussing fixed rations.

It may be of interest and serve as a basis for some to know that the average daily ration fed the twenty-one cows in our herd a year ago this winter contained 22.65 pounds of dry matter, 2.19 pounds of digestible protein, and 13.20 pounds digestible carbohydrates and fat. The nutritive ratio of this ration was 1:6.0. The average weight of the cows was 1,076 pounds, and the average production per cow was 20.58 pounds of milk and .908 pounds of fat. This ration amounted to about five pounds of hay, forty pounds of corn silage, and eight pounds of grain, which was principally bran, distillers grains and cotton seed meal, mixed in the proportion of 2:2:1. The cow, Lady, which gave the highest average amount of milk and butter fat, 36.7 pounds of milk and 1.56 pounds of butter, received about fifty pounds of silage, five pounds of hay and ten pounds of grain.

The method of feeding the herd at our University Farm is one to be recommended to the dairyman of the state, although he need not be as accurate perhaps in all of his calculations. It is

aimed to make the bulk of the winter ration silage, hay and fodder, and the summer ration for roughage, pasture, supplemented by soiling when necessary. The amount of roughage is determined by the amount the cow will eat with good relish, and at the same time consume her grain ration, which is given in amounts according to her production. These amounts of grain will vary somewhere from four to fourteen pounds per day.

The stage in the period of lactation, the amount of milk flow and the increase or decrease in body weight are the indicators that govern the amount of grain to be fed. All feed, with the exception of pasture, is weighed. It may seem to the practical man that this is requiring a great deal of time, but it is quite possible for a careful observer to note what his cows are doing with the feed they are consuming without all the trouble of weighing each feed. A man can weigh out grain to cattle very accurately without scales, providing he has measures which he understands, and it is very easy to have such. A scale for weighing milk and other farm products is a profitable thing to have, and I am confident it would pay every dairyman to weigh his milk at least once a day, if not twice, in order that he can have some idea as to what results he is getting from the feed he is putting into his herd. With such a system of feeding and keeping records of the production, improvement is bound to follow. Cows will have to respond or men will know the reason why. They can be fed to the limit of their capacity, which will be determined in every case. Where capacity is wanting, feed will be saved by being withheld or put into a better grade of cows. Extravagant feeding will be avoided. Without such a system, it seems the dairyman is no more consistent in his business than a grocer would be who bought and sold goods regardless of weights, cost, or giving any attention to his cash register.

In conclusion I would say that I have not tried to make a great many points, but believe that there is a great possibility for feeding our dairy herds and improving them in a few points I have tried to make. Let us bear in mind that we must endeavor to grow animals and develop them so far as possible into strong, healthy, vigorous animals, which shall be able to resist disease and be immune to it. This is necessary since disease is

becoming more prevalent each year. Again, let us feed to bring out and develop all the dairy tendency that may be present in animals in our possession, discarding those which are a failure and replacing them as fast as possible with the animals which have been bred right, selected right, and which are bound to respond to intelligent feeding.

DISCUSSION.

Ex-Gov. Hoard: Is the ordinary dairyman a liberal feeder?

Prof. Humphrey: Not until he is educated to that point. I should say the average patrons of the creameries of Wisconsin are not liberal feeders.

You can take another class of men and they have to be intelligent, educated feeders, they are dealing with an animal that is too refined, too delicate in formation to stand anything else. She will be a failure under any but the most intelligent feeders.

Mr. Taylor: How came she to be too fine?

Prof. Humphrey: It is through her selection, through her development.

Mr. Taylor: Lack of development, I should call it.

Prof. Humphrey: She has been bred from ordinary stock, that has given her that conformation and has been encouraged by men who do not understand breeding properly and maintaining the size and retaining the characteristics of the breed in a great many instances.

Ex-Gov. Hoard: Is size an indication of dairy strength?

Prof. Humphrey: I believe it is.

Ex-Gov. Hoard: Then the bigger the cow, the better the cow.

Prof. Humphrey: Provided she has what we call the dairy tendency accompanying the size.

Ex-Gov. Hoard: Is the 1500-pound Jersey better than the 900-pound?

Prof. Humphrey: I believe she would be if the dairy tendency were the same. I believe it would be better.

Ex-Gov. Hoard: Is that beefy Jersey up there (referring to

charts exhibited by Prof. Beach) on the chart better than this one?

Prof. Humphrey: I will answer that later, I am a student.

Mr. Taylor: What per cent of the Jerseys coming under your observation have been over developed, that is, have been fed beyond their limit of production; in other words, Nature built them to perform to a certain limit. Now, what per cent of them have ever reached that limit, their born limit of production?

Prof. Humphrey: Very few of them.

Mr. Taylor: If they have not been fed only a very few of them. Is a small cow an underling because of light feeding?

Prof. Humphrey: I would say that a great many of our Jerseys are that way.

Mr. Taylor: Then, is it not an unfortunate thing that she has met with the average dairyman and not the educated dairyman? Isn't it a fact that a Jersey bred animal will deteriorate faster than any other pure bred animal, from your observation, from the fact of the higher standard that they have to fall from?

Prof. Humphrey: I think it would be due to the fact, if they fell in our estimation, to the lack of greater strength and vigor than a great many possess.

Ex-Gov. Hoard: I am not satisfied exactly with your answer to my question as to size as an indication of vigor. The snow bird can out-vigor any animal on earth.

Prof. Huhphrey: But I believe it is necessary to have size in order to have capacity to make an animal respond in the most economical manner.

Ex-Gov. Hoard: Matilda IV made over 900 pounds of butter in one year, and that was more than she weighed.

Prof. Humphrey: There are exceptions, of course. There are cases of small forms that have made wonderful products.

Ex-Gov. Hoard: They were cows of great vigor.

Prof. Humphrey: Yes, that is true; but the average in my estimation and from my observations would lead me to believe that the average number of cows of that size, provided they had constitution and vigor, would fall short in their average production from what would be expected in a class of animals that averaged larger in size.

A Member: Do you believe that there was ever a cow born

and fed so as to reach the limit of her capacity from the time she commenced until she quit.

Prof. Humphrey: There never was; we don't know enough about feeding to do that.

Secy. Burchard: I object to that answer a little. It is predicated on ignorance. You don't know whether certain cows have not been brought up to the very maximum of their capacity.

Mr. Goodrich: I want to say something about this size question, as an indication of profitableness. A few years ago the Secretary of the Dairymen's Association gave me for the subject on which to write a paper, "The Cow That Pays the Best for Her Feed." That is the cow we all want. I took the World's Fair record and a good many others, but that in particular. I took each breed, divided them into three classes, the largest, medium sized and the smallest, each breed, the Jerseys, the Guernseys and the Shorthorns in the same way, and in every instance the medium sized cow, I mean the medium size for her breed, paid the best for her feed. You take and divide them up in that way and you will find it is not the big cow nor the little cow, but the medium sized cow, just the same as the medium sized man, about like me.

Prof. Humphrey: I believe every animal is possessed of a dual tendency to a certain degree.

Ex-Gov. Hoard: Did any man on earth ever develop a specific breed of cattle that was bred for dual purposes?

Prof. Humphrey: I said to a limited extent.

Ex-Gov. Hoard: Did he ever develop that kind of a breed? Or didn't he have to breed for a specific purpose?

Prof. Humphrey: Some animals, in their natural development to a certain extent will develop to give a certain amount of milk, and to a certain extent they will develop and carry a certain amount of flesh.

Ex-Gov. Hoard: You do not answer me. Was the Jersey breed of cattle developed as Jerseys by breeding for a dual purpose?

Prof. Humphrey: No.

Ex-Gov. Hoard: Was Cruickshanks' Shorthorn developed by breeding for a dual purpose?

Prof. Humphrey: No.

Mr. Rietbrock: Do you mean that if a Jersey cow shows a disposition to lay on flesh, that is, one individual does that, while another does not show that tendency, that shows a dairy tendency?

Prof. Humphrey: That is true.

Mr. Rietbrock: Now, in the one that shows the disposition to lay on flesh, you say she has two purposes. I think that every cow has a dual purpose, even the most scrawny Jersey or a Guernsey, and that flesh, as far as it goes, is good to eat, but it is not as desirable flesh nor is it as profitable flesh to produce as that of a beef breed, but it is dual purpose, and that is the way I understand the professor.

Prof. Humphrey: It is dual purpose. You understand, Governor Hoard, my statement that I believe every animal is possessed of a dual tendency. You may consider that a dual purpose to a certain degree. Now, one of these tendencies I believe, usually will predominate, and feeding, after the heifer has freshened, is one of the best methods of revealing what the tendency is going to be.

Ex-Gov. Hoard: Which one should I as a dairyman breed for?

Prof. Humphrey: The dairy tendency, of course.

Ex-Gov. Hoard: Then cut out the other. You state there near the close of your paper, feed to develop the dairy tendency in a calf. That was your idea, wasn't it?

Prof. Humphrey: To feed to develop the natural growth of the calf.

Ex-Gov. Hoard: What about the temperament and tendency of the animal? Has that anything to do with the way you feed?

Prof. Humphrey: In my estimation, I believe that any class of feeds which tends to a natural growth, a maximum growth, will develop a calf that at the time of maturity will be suitable for a dairy animal or suitable for a beef animal, but the determining factor will be that inborn, inherent tendency which determines whether that animal is going to develop from that time into a strong dairy cow or a strong beef cow.

Ex-Gov. Hoard: But is it possible then for you to so feed as to divert the inborn tendency of this animal to a butter development?

Prof. Humphrey: Only as I withhold the feed and weaken

the strength and constitution of the animal to become a vigorous working animal as the inherent tendency would determine.

The Chairman: Two or three times you have used the expression "at maturity."

Mrs. Howie: Isn't it possible to overfeed a calf?

Prof. Humphrey: I would say only in the sense that we feed so much one day that the animal is off feed for the three following days.

Ex-Gov. Hoard: Did you ever make any experiments along this line?

Prof. Humphrey: That is one of the points that I must admit that I have gained these ideas from observation more than I have from work that I have actually done myself. I know of herds where dairy calves had been grown, and they have been given those feeds that developed a maximum growth, and when they reached two years or three years of age, they were more what we would term beef animals perhaps than dairy. Now, if the inherent dairy tendency is in those animals, they will commence after they have freshened, and as they gradually grow older they develop into strong dairy cows that, in type, are as good dairy cows as you can ask for.

Ex-Gov. Hoard: Did that one on the chart do so?

Prof. Humphrey: If she didn't, it was owing to the fact that she did not have the dairy tendency strong enough to make here that kind.

Ex-Gov. Hoard: But she was equally as well bred along the lines of dairy tendency as that other one. Whence the difference?

Prof. Humphrey: We can't explain that. We know that we are disappointed a great many times in the results of breeding.

Mrs. Howie: Isn't it possible to overfeed a calf so that it will never reach that age, that it may die in a few weeks, from overfeeding?

Ex-Gov. Hoard: Sure.

Mrs. Howie: It is a very risky thing in my experience to overfeed a calf. In the first place the calf's stomach is very small and tender, and if we let it measure its own ration, we would surely bring on digestive troubles.

Prof. Humphrey: I hope you understand the statement that I make, that a calf is never overfed only in the sense of what we term "overloading" so that the digestive organs are put out of condition.

Ex-Gov. Hoard: I had a high grade Jersey cow that gave me three heifer calves in succession. The first one I fed to develop her dairy qualities; the second I fed on fattening food steadily until she was eighteen months, and the third I handled as I did the first. The first and the third proved to be first class dairy cows, and the second one was absolutely spoiled and never amounted to ten cents.

Prof. Humphrey: Were you perfectly satisfied that it was the system of feeding that you practiced in the development of the calf that caused her to prove a failure?

Ex-Gov. Hoard: I am giving you the exact facts; the first and third were successes and the second was a failure.

Prof. Humphrey: I would agree with you that in the case of those three animals that would go to indicate that your system of feeding——

Ex-Gov. Hoard: Had spoiled the animal in one case.

Prof. Humphrey: Had spoiled the animal.

Ex-Gov. Hoard: That is what it did, and I did it on purpose, to see whether I could spoil it or not.

Mr. Goodrich: Would you feed a heifer calf that you wanted to rear for a dairy cow just the same as you would a steer—that you wanted to raise for beef? Would you feed them just alike when you were growing and developing them?

Prof. Humphrey: I presume you are referring now to the general practice of allowing our beef animals to suckle their dams and come up in that manner?

Mr. Goodrich: Yes, and then feed them grain, corn?

Prof. Humphrey: I would not recommend that, it is not the proper manner of raising a calf.

Mrs. Howie: Wouldn't it be wiser to measure the milk that calf was given, and wouldn't you use a good deal of judgment in feeding grain if you were developing this animal? You surely would not force unnecessary growth, but would you allow it to have grain after it was eight or ten months old?

Prof. Humphrey: I would commence feeding grain at ten days old.

Mrs. Howie: Then how long would you keep that up?

Prof. Humphrey: Until the animal had reached the stage of maturity.

The Chairman: Suppose you fed this animal grain and its appetite was satisfied on those heavy concentrates, do you think it would eat sufficient roughage to develop its barrel as you would wish to have it?

Prof. Humphrey: I don't believe any animal could be successfully developed by depending upon concentrates alone, whether we are developing that animal for a dairy animal or for a beef animal.

Mrs. Howie: Would it be wise to allow that animal to measure its own allowance?

Prof. Humphrey: Because in a great many instances, where you commence feeding concentrates to an animal, that is, where the animals are allowed to run with their mothers, brought up according to nature's laws, when a man begins to feed the calf, he must be very careful in his feeding, that he does not satisfy the appetite to the extent that the animal overeats, and thus deranges the digestive organs.

Mrs. Howie: It is quite necessary that one should understand the limit of the animal's capacity.

Prof. Humphrey: Yes, and that calf must have the closest observation and carefulest attention, which I have said was necessary in making that growth.

Ex-Gov. Hoard: Then you do not believe in the idea of specific dairy development through feed?

Prof. Humphrey: No, sir.

Ex-Gov. Hoard: Or specific beef development through feed?

Prof. Humphrey: No, sir.

Ex-Gov. Hoard: You consider that one is equivalent to the other, and that by the same process you develop one the same as you do the other.

Prof. Humphrey: The question of breeding and selection must come in there with the feeding, as Mr. Gillett says, the matter of breeding determines everything—no, I wouldn't say everything, but the matter of breeding has a great deal to do in giving the animal that tendency that is going to result in the animal's usefulness.

Ex-Gov. Hoard: Would you feed a dairy cow for the development of milk as you would a steer for the development of fat?

Prof. Humphrey: It depends upon the individuality of that cow.

Ex-Gov. Hoard: But would you put up a ration for a steer the same as you would for that cow?

Prof. Humphrey: It would depend upon the cow, I couldn't say. There are some cows that want the ration that would be suitable for the best steer that you could feed and finish off. Our live stock exhibits show that. I have seen cases where a cow would demand corn meal in great quantities in order to make her maximum production, to encourage that dairy tendency which she possesses.

Mrs. Howie: Isn't it possible to overfeed a cow for production, and to thereby lessen her production?

Prof. Humphrey: Yes, it is, but I can't tell you what the limit is.

Mrs. Howie: Well, we must find out how to limit ourselves if we are feeding cows. Now, don't you think it is a very nice way to have an average ration and then if you suspect your cow may go beyond that average ration, you add a little more meal until she begins to drop off and then cut it off and get her up to her limit and hold her there?

Prof. Humphrey: That is the plan we are following in our university herd. I don't know that I brought that out in reading my paper. Every individual in our herd is carefully considered once a week, as to what she is producing and as to what she is consuming. We find that some of our cows have a tendency to reduce in weight on certain grain rations. Their production may run along evenly, but they are making that product at the cost of flesh. Now, then, there is something wrong with that ration, providing the animal is in ordinary condition. If the animal is naturally fleshy, which we aim to have her at the time she calves, in good condition, she naturally will reduce somewhat in flesh, but after she gets down to a certain point we know that it is not the best thing for that cow to have her making her production at the cost of flesh, and being reduced in weight to the point that she is not strong enough physically to make a good production, and then the grain ration

must be increased. Maybe that increase will increase our flow of milk, and we cannot always determine just how much grain we want to feed to get a maximum production of milk, and maintain that constant weight. Mr. Gillett asked was there ever a cow that was fed just right for making a maximum production, and I say no, for the reason that it is not possible for us to put grain before the animal that would encourage the greatest amount of production and at the same time the greatest economy of production.

Some of these Jersey cows that were over at St. Louis at the exposition, some of the Holsteins and the Shorthorns,—I have reason to believe that there was a great amount of grain fed which, in many instances, was wasted. It was not economy, and consequently not successful feeding. It is hard for us to determine, but by the use of systematic feeding, careful observation as to the condition of the cow and as to the results of her production, it is possible for us to do a great deal better and be much more successful than we could hope to be if we are feeding in a haphazard manner and feeding regardless of the condition of our cows and regardless of our production.

Prof. Beach: The question of size was raised here. I have with me a few figures with reference to the dairy capacity of two different classes of Jersey cows, twenty-eight weighing 850 pounds apiece and twenty-eight weighing 975, a difference of 125 pounds in live weight, and there was only a difference of 75 cents in net profit, so I do not believe that size cuts much figure in the profit from the cow.

Mr. Scribner: I do believe this one thing, that under-feeding has a tendency to reduce constitution, and when we decrease constitution, we are going to hurt that dairy tendency to make butter. I believe we can put on flesh with the right kind of feed, and it doesn't hurt anything, but I would not want to put it on with the kind of feed we give a steer. If a heifer does lay on flesh at two years, I don't care. If she has the right tendency she will come into form without any trouble at all, if she has the milk function. If an animal is ever going to build up a constitution in the world it is going to do it when it is young. The first year is the important year—and the second year is just as important, and so right along.

Mr. Gillett: There was in our own herd a case of a cow that will probably go down in history, a Holstein-Friesian. I refer to Johanna Rue. This cow was reared by us and showed a wonderful development and wonderful producing capacity to the time when she was eleven years of age, when she aborted. In all the stages of her development, she was a perfect model of a dairy cow, a strong dairy cow. As I say, she aborted at eleven years and we did not succeed in getting another calf from her until she was fourteen years old. At that time she had a wonderful amount of superfluous flesh. If Governor Hoard had seen her the day before she freshened at fourteen years old, he would have said that cow was not worth a snap, because she was a perfect beef animal. But notwithstanding that fact, at fourteen years of age, after getting onto her feet from milk fever, she milked up to 75 pounds a day, and three months from that time she was right back to her old form, as typical a dairy cow as you ever saw. Another point in her case, as an illustration of how feed may influence form,—and function is not sometimes so much dependent on form,—I was going over my books the other day and among the progeny of this cow I noticed that we had four daughters that are now matured. Those four daughters have reached an average yearly production of over 16,000 pounds per cow and over 500 pounds of butter fat, and her two-year-old daughter, which freshened last September and which she produced when she was a beef animal, from last September up to this time, has given over 5,000 pounds as a two-year-old, and promises to excel them all. It seems to us that if you let them develop along that you may develop a form which very often is misleading.

Mr. Taylor: Supposing this cow had aborted when she was five years old or four years old and had gone dry for three or four years and taken on this great abundance of flesh, before she was fully developed. What would you expect she would do then?

Mr. Gillett: I believe that cow was born with that latent power, and that power would assert itself at one time or another in her lifetime.

Ex-Gov. Hoard: Bro. Gillett rather misspoke himself, I

think. He spoke about function being dependent on form. Function is never dependent on form.

Mr. Gillett: Not always.

Ex-Gov. Hoard: Never. Form indicates function. The bottom proposition is temperament or tendency, and function is dependent on that, and then form is dependent on function; so when we would indicate what function and temperament are we trace back the road. Starting with form, we indicate what function is, and function indicates what temperament is, and we breed for temperament in order to decide function and to produce form.

Mr. Jones: Are we to believe then that at any stage in the growth, whether fourteen or five years, or two or six months, that we do not endanger the future possibilities of a heifer calf for dairy purposes by any kind of feeding or laying on of flesh? Is that the conclusion we are to arrive at from all this wisdom that has been spread out before us today?

Prof. Humphrey: My belief is that if the calf, in the natural development from the feed that has been given, develops a considerable amount of flesh, that is, that it will give it that rounded appearance, perhaps beefy appearance, if that is combined with an inherent tendency that leads toward the direction of dairy production, that will have no influence whatever, or no harm will result from that kind of feeding.

The Chairman: Now, let us get a little consensus of opinion on this subject. Let Mr. Jones ask his question again.

Mr. Jones: I have been reading dairy papers and I have been attending Dairymen's Associations and Farm Institutes for a great many years, and keeping my eyes open all the time and trying to put something of what I hear into practice, and I have understood that I might endanger the dairy tendency of my heifers according to the way I raise them, and feed them. I have been taught that certain methods of feeding might endanger and divert their natural tendency toward dairy purposes by injudicious and unwise feeding. Now, as I understand from what has been said here today, am I to believe that there is no danger in this respect, that we can put on a great deal of flesh at any time, from the time the calf is born until it is matured, or until it is fourteen years old, without any danger whatever to the tendency of that calf.

The Chairman: I think that question was fully understood and answered by Prof. Humphrey. Now Mr. Gillett.

Mr. Gillett: I want to say this, first, I consider that every animal at its birth is destined to become a certain size at maturity; I believe that the sooner we judiciously reach that mature growth, the sooner will we realize a more economical utilization of the feed that we feed to that dairy cow. Now, if an animal does not get its growth until it is six years old, the feed that we commence to feed that animal for the purpose of producing milk is part of it used to make up that growth. Whereas, if that animal gets its growth at three years old, and begins to turn the feed that you use into milk earlier, I think the earlier development and growth is more economical. I do not belive that it is possible to get too much growth, providing you do it with the right kind of material; and what I would consider the right kind of food material is bone and muscle producing foods, not heating foods and not too wide a ration, too much carbohydrates.

Ex-Gov. Hoard: Mr. Bates warned the beef men of England that they were developing Shorthorns beyond an economical size. He said, "Gentlemen, you are developing Shorthorns to a size that will require too much food to maintain bodily support, and you cannot economically produce the flesh you want nor the finish you want on such a size animal." May it not be just as true of the dairy cow as of the beef?

Mr. Gillett: I think this hypothesis is wrong. I am going to say right here that I believe size with a certain degree of refinement is a desirable characteristic of a dairy cow, and I am going to take as an illustration, two engines, the power of one is ten horse power, and the other is fifteen horse power. The mechanical construction of those engines makes it possible for the fifteen horse power engine to exert one-third more energy than the ten horse power engine. Now, gentlemen, if we can breed the horns off of cattle, which we have been able to do, we can breed that increased energy in the dairy cows of the future.

Ex-Gov. Hoard: But you are comparing things that differ.

Mr. Gillett: I am not. The principle is the same theoretically. I say, if you have a cow, which at the weight of 1,000 pounds is supplying you so much milk producing function, if

you have that same power proportionately in a 1,500-pound animal, it is a desirable characteristic in that animal.

Ex-Gov. Hoard: Do you maintain that the milk producing power of a cow is the same as the power producing power of an engine? I say it is different.

Mr. Gillett: In the case of an engine, we have an energy which is figured out mechanically. In the power of the cow, we cannot figure mechanically, or mathematically. I made the statement, and I stick to it, that I do not believe it is possible to do harm, providing the proper food it fed.

The Chairman: You speak of the amount of growth. The gentleman asked about flesh.

Mr. Gillett: I don't think he hurts it by fattening it, providing he fattens it with the proper kind of food.

The Chairman: Now, Mrs. Howie.

Mrs. Howie: I have been under the impression for several years that we could overfeed an animal, and that if you kept it growing naturally, kept it as healthy as you could and limited its food with your judgment, you could easily discern if it went back at all. You can keep the food before it and then take it away at a suitable time, give it a large amount of roughage and plenty of water, and you will develop an animal that will be a credit to your dairy.

The Chairman: You are not answering the question any more than Mr. Gillett. The question is, from calfhood to motherhood does it hurt that animal to make it fat?

Mrs. Howie: I believe it does. I believe that I ruined several fine heifer calves by replacing the fat in the skim milk by too much oil meal. Now, as to the size of the animal. If Mr. Gillett were selecting a jewel for his shirt front would he take a plate glass window or would he take a little gem of greatest quality?

The Chairman: Now, Mr. Everett, and I am going to pin Mr. Everett right down to answering this question.

Mr. Everett: You are not going to do anything of the kind. I haven't said a thing this afternoon, and I am going to hold you responsible for letting this discussion run away with itself.

The idea has gone out here that the dairy heifer calf may be allowed to suck its mother six months or a year on five per cent milk and make just as good a dairy cow as

they can on skim milk. Another idea has been allowed to stand out here, that you can feed a dairy calf anything and make a good cow of it, and my experience as a dairyman refutes the proposition. Mr. Scribner helped the matter a little, but not quite enough. Mr. Gillett did better when he classified the feeds and said "not if you feed proper food." I do not want to feed a heifer calf intended for dairy purposes on foods that will make that calf fat. I wouldn't let that heifer calf suck its mother, because in that way I am educating that calf away from the dairy tendency toward meat production, and my experience convinces me I will spoil that calf in that way. I want to rear that calf on protein foods; make a good, strong, vigorous, healthy calf; but that calf has not and never will have any use for beef, so what is the use of feeding foods that will encourage the beef tendency?

The Chairman: That is a good answer. Now, Mr. Goodrich.

Mr. Goodrich: To get right at the answer I believe if you should let the best bred heifer calf in the world run with its mother and have its mother's full milk until it is six months old, give it some corn and make is very excessively fat and keep it that way till it freshens at two years old, it would not be worth half as much as though it had been fed as Mrs. Howie would feed it, because you have developed a beef tendency that would always stick to it. It would give a good mess of milk perhaps for a while, but when you fed it up to keep it up to the top of its milk production, it would begin to pile on fat instead. There is a physiological reason for this that I could give, but I guess I won't.

The Chairman: I am going to call for just one more answer to this question. Mr. Taylor, answer this same question.

Mr. Taylor: I believe that we can so feed a young dairy bred calf in its early growth, as to ruin it as a dairy animal. I do believe that that only occurs once in a great while, and is not liable to occur after it gets into milk; that there are more cows underfed than there are overfed, more horses overfed than underfed, and all men overfed.

My brother, keep on reading the dairy papers and believe what you want of them. Theory and practice were married

a great many years ago and no man is fool enough to print anything over his signature in the way of a theory that does not comport with the best practitioners in that line. And no man is fool enough to do any dairy business in Wisconsin that does not accord with theory. Now, read all the theory you can and put all that into practice. I believe fully that if this Holstein cow had aborted with her first calf, or had aborted with her second calf, that she, with all her strong dairy tendency, would have been ruined. If she had aborted with her third calf, her fifth or sixth, and had not conceived again until her ninth year, she would have been diverted from the dairy tendency to a beef tendency; but she was fed and fully grown and fully developed to her eleventh year before this occurred, and her tendency was fixed and you could not divert her. At the same time I want to say that it grieves me to see a pure bred Guernsey calf or a Jersey calf with a small amount of flesh on its bones and its carcass, calculated by nature to turn farm products into dairy food economically, I am sorry to see it underfed and starved and then have the professor observe that they are a degenerate, weak race. In such cases, it is the lack of food, it is not the lack of breeding. If you have calves, look after them and see that they are so fed that every one of them grows when they begin to grow, and they will do it if you are giving them the right kind of food. I think we have misunderstood the professor here, because we have presumed that that steer fed for beef and fat has been properly and correctly fed. I want to say that he has not been fed right, that the same feed that would grow and develop a dairy animal before it comes into milk is a proper ration for a growing steer. The professor intended to give you a growing developing ration, and both the heifer and the steer will grow and develop on the same ration until you reach a certain limit, and then you trade off and you give the heifer a dairy ration and she makes a splendid dairy cow and you give the steer a fattening ration and he will live up to that about ninety days and then he will go back.

Ex-Gov. Hoard: The feeding for lean and the feeding for fat is a very good illustration of the effect on the bodily growth.

The Chairman: I am going to change my ruling and call upon Governor Hoard. I wish I might call on Mr. Rietbrock

and Mr. Jacobs and Mr. Scribner and a lot of others, but I am going to limit it to the governor.

Ex-Gov. Hoard: I set out to spoil this heifer I told you about, and I want to tell you how I spoiled her. You remember that I told you that these three successive heifers from the one mother were handled with the idea of seeing whether the handling, the feed, etc., would have anything to do with the future character of these heifers. The first one I fed on skim milk and oats; the second one, which I spoiled, I fed on corn meal. I did all I could to lower the protoplasmic growth of that heifer and fill her up full of carbon. Corn meal is almost pure carbon. I kept pushing this heifer right along and she was hog-fat when she was six months old. She kept hog fat until she was three years old and she was a dead failure as a cow. I intended she should be, I hoped she would be, but I wanted to be sure. The first heifer I fed in the way I told you, and she proved to be a very nice cow, and the third one I fed in the same way as the first and she proved to be a nice cow. These things, with observation, have convinced me that there is such a thing as judicious feeding and that there is such a thing as dairy feeding for the development of dairy cows. Bees know the value of feeding. They will take a certain food and develop the drone, they will take another food and develop the neuter, they will take another kind of food and develop the queen.

Mr. Emery: I want to speak just a moment on this question, and I will answer directly the first question, that I am fully of the opinion that this calf can be seriously injured as a dairy cow by the method of feeding. Whether it is a man or a horse or a dog or a cow that comes into the world, they all come with certain inherited possibilities. We call them powers or tendencies. They are simple possibilities, and these possibilities are brought out by environment and these are the two comprehensive forces that bring every individuality to its maturity, and the great work is the establishment of habit. Now, I will undertake to defend the proposition before this audience that the great work of education is in developing and fixing habit. Now, when we are feeding that calf, we are fixing a muscular habit, we are fixing a habit in that calf's constitution, and if we shall so feed it as to fix the habit of laying on fat, there is

that tendency, there is that habit, and it goes on as all other habits go on, and it weakens the dairy tendency. The laying on of flesh on the outside is not a dairy tendency, it is not a dairy habit. It is the converse of that, and that habit created is like any other habit, it comes in to hinder or weaken different and better tendencies. We want to fix the dairy habit in this calf, and I believe we fix that dairy habit by the way it appropriates its food and gives it energy to do the specific work. I believe this is the fundamental thought in dairying. The teaching and the practice of the dairymen in Wisconsin is all wrong, unless this is true, and we have got to begin and learn things all over again.

Mr. Rietbrock: Governor Hoard has told us that he spoiled his heifer calf by his method of feeding. I want to ask him the question if he had fed the same ration to steers of the same age what would have been the effect upon those steers?

Ex-Gov. Hoard: I don't know.

Mr. Rietbrock: Well, I do. It would have spoiled a steer just the same.

The Chairman: I think it quite likely that in listening to this discussion some of the audience have gained an idea that there is a good deal more divergence of opinion than there really is. It has been my privilege many times to visit Governor Hoard's calf barn and also the calf barn at the Experiment Station, and the calves look just alike.

Ex-Gov. Hoard: I do not want that anyone shall be misled in their breeding and handling and developing judgment.

Secy. Burchard: I think I can perhaps say a word that will tend to harmonize what seems to be a conflict of opinions here. If I was to criticise what Professor Humphrey has said in regard to feeding the calf, it would be to the effect that he did not specify quite enough. I believe every calf, in a way, should be fed up to the limit of its capacity—not always to the limit of its appetite, because it may overfeed if left to its own judgment. Now, to do that, the careful feeder should select those feeds with a view to developing first, in my judgment, a healthy growth, and of course in doing that we must not forget, as Mrs. Howie has said, that the calf has a weak stomach and cannot digest concentrated food, nor what we ordinarily call roughage, at the very first, though in a few days it will com-

mence to nibble at some hay, if it can get it. We must be wise, feed it to stimulate growth, but feed also for the purposes of developing a digestive tract, and there is where the roughage comes in, and in that way of feeding the calf, I do not believe you will be very likely to get on too much fat. Experiments have shown that calves or steers can be developed up to an unnatural growth early, and unnatural development of fat as distinguished from muscular tissue, from lean meat, and I think that to be very objectionable in raising a dairy heifer or a dairy bull,—for I believe that the dairy bull should be brought up the same as the dairy heifer.

Prof. Humphrey: Mr. President and Members of the Association, I know you will realize that I have the failing of getting excited. I presume that I have made statements here that have not been clear to you, and I feel that our discussion is owing to the fact that there is not a clear understanding between us as to what we consider the natural muscular development and growth on the part of the young animal. It is interesting for every person to study how meats are developed in the different forms of animals. Now, the dairy cow has just as many muscles as the beef cow, so far as muscular development is concerned; there are the same number of muscles in her body that there are in the beef animal, and in considering growth we must consider the conditon of those muscles. Now, fat and flesh are two different things. Fat never made an animal strong. If you were feeding a calf with the idea of just developing fat, that animal wouldn't do for beef, for it isn't fat that you want; it is meat, muscle mixed with an amount of fat that makes that meat juicy and tender. The development of muscular strength in the dairy calf, as we are growing it to maturity, is no detriment whatever to the development of the power of the animal to become a strong dairy animal; that is what I believe. We do not understand the difference between fat and flesh. Even with Poland China pigs, you feed a very fattening ration, you tend to develop a short-bodied, small, round, dumpy pig that hasn't growth enough to make it a desirable pig. You can spoil that pig in its development by the kind of feed that you feed it, and you can spoil a heifer.

Ex-Gov. Hoard: That is what I did exactly.

Prof. Humphrey: But in proper development, I say you

could not overfeed that animal with the class of food that would develop its proper growth, which would not be a fat growth but a natural growth.

Ex-Gov. Hoard: That is all right.

Prof. Humphrey: You have seen beef animals put onto the market that were not raised by new milk alone, and perhaps they were equally as good, when finished, as some of those that grew up at the side of their dams. We have some steers in our herd today at the University farm that as yearlings were as thin and scrawny—I won't say scrawny,—but as thin in natural development as any dairy heifer would be. That is, they had a peculiar conformation different to the forms of some of our dairy animals, but though they were lean they were strong. Now, they had to have feeding capacity, and those steers with that beef tendency have developed into perfect beef animals, when, if they possessed a strong dairy tendency that would not have been possible.

I am not going to say anything further, I hope that we understand each other now, and it is a matter for you to decide what will be the best ration for developing that perfect growth. I cannot tell you, because if I fixed a ration for you, perhaps the tendency of that animal might go back and fail in proper development. You must study this thing, give it your close attention and decide for yourself.

Mr. Scribner: I believe that the average farmer, all over the country, the average dairyman, underfeeds his calves and that he thereby hurts their constitution, so that when they are grown up they are not able to digest and assimilate their food. So I say we better encourage them to more liberal feeding and the right kind of feeding. We do not pretend to feed our heifers on corn meal. They get a little ensilage, the leafy part, but they have bran and oats and hay, and if they put on a little flesh with that kind of feeding, I have no objection to it. That is where I stand.

Mr. Everett: And that is pretty near the whole thing.

Mr. Jacobs: I stand upon the some ground that Mr. Scribner has taken. I do believe that it is necessary to impress upon the farmers in this country and in this state the necessity of feeding this calf liberally and feeding it all the time. We have learned from the sheepmen that if a sheep has a sick time, or is

short of feed, there is a place comes in the wool, a weak place in the fabric corresponding to that sickness. Now, this dairy calf, perhaps you have been caring for it and feeding it reasonably well up to about five or six months, and then you consider this calf can get along without milk, and you turn it out and you don't pay much attention to it, and it runs and has to take pot luck with the rest of the herd, or perhaps the flies are getting bad; and I tell you that calf will never get over that experience. You must keep feeding it, it must not be allowed to run down for one minute; it must be kept growing and thriving all the time.

Mr. Everett: I believe that the President of this Association is one of the leading dairymen of this state, and I would like to know what his opinion is on this subject.

The Chairman: I believe I have as pronounced opinions as any of the rest of you, and yet I agree with the rest of you. After all, there is very little difference of opinion between us. The professor explains that when he says flesh he means a large development of the muscular tissue. I have come myself to believe in a greater development, a more rapid development of the dairy cow. We have been troubled quite considerably with contagious calf cholera, and for that reason we have not been able to crowd our calves as hard as we have done in former years, but I do intend to so feed them that they may grow rapidly every day of their lives. I don't want them fat, but I want them to make just as large muscular growth as possible and when the time comes for them to freshen, I do not mind if they at that time become somewhat fleshy. They are never fed fattening food, by that I mean grain food. They do have silage and clover hay for roughage. I never have had a heifer properly bred but what would milk that flesh off at once. My own experience shows me that that class of heifers, grown in that manner, make by far the best cows in my herd.

Mr. Emery: Don't you think the so-called calf cholera is due to overfeeding?

The Chairman: No, sir, I know it has not anything to do with it. It is a contagious disease.

Mr. Goodrich: I have known them to have calf cholera before they have eaten at all.

Mr. Everett: It strikes me that our point is to teach the

Marathon county farmer and every other farmer how to properly rear good calves for dairy purposes, and the matter is simple. I happen to be an old calf breeder. I kept on my farm a herd of grade Jerseys, and a herd of Shorthorns of the Cruickshank type. The grade Jerseys were raised on skim milk and I would rather have a skim milk calf for dairy purposes than to have a whole milk dairy calf. Mr. Scribner said he would like his heifer calves to have a little ensilage, but he is particular that it should be the leaf portion. I let my Shorthorn calves have all the ensilage they wanted, but never the heifer dairy calves, just a little of the leafy part of the ensilage to add a little succulence to the ration. Now, I suppose I will hurt Mrs. Howie's feelings when I say that I always took the calf away from its mother immediately. It was always my part to take the calf away from its mother at once. Of course, I mean I did not let the calf suckle its mother. I did not separate the two entirely, but placed the calf at the cow's head and would sit down myself and milk the cow instead of letting the calf do the milking, and not one will ever distinguish between the two calves; that is, the one that is milking and the one that she is licking. Then the next thing is to take a little of that whole milk and teach the calf to drink t. I want to encourage these Marathon county farmers to raise calves, because they have a splendid country here to do it in.

A Member: I want to ask some of you dairymen a question about breeding. A neighbor of mine has had three kinds of bulls in the last five or six years. What do you think is the result?

Mr. Everett: He has got hash. Choose the breed that you like best and stick to that breed for a term of years, and whenever you buy a sire buy one of the same breed, and breed in line as nearly as you can. I want to say about teaching a calf to drink, we must have patience, remember when some of you were boys you didn't know half as much as the calf, and don't get mad at it and slap it because it doesn't eat the first time. I never had any trouble teaching the little calf to suck my fingers. Feed them this milk all the time and in small quantities, three or four times a day. The whole proposition is butter fat; that is what we are after. The cow isn't worth anything that doesn't give lots of butter fat. You can't afford to feed

this calf butter fat, so you take the butter fat out of the milk and send it to the creamery and after a little while you begin to add skim milk to this whole milk, so that when the calf is ten days old you have ceased feeding mother's full milk and are feeding skim milk. You must add something to that skim milk, and for this I use oil meal jelly. I pour boiling hot water over a quart or two of oil meal, and in a little while it becomes oil meal jelly. You add a tablespoonful of this jelly to the skim milk, and it will dissolve, it is better than butter fat for the calf. About the same time I teach this calf to eat whole oats. Take a handful of the oats and smear them on the calf's nose and the oats will stick there and they will begin to eat and there is nothing better for them. Raise a little clover hay and always keep it where the calves will help themselves and you have a good combination of feed. After they begin to eat the oats, you can leave the jelly out of the skim milk, because there is enough fat in the oats and in the clover hay. Give them a little bit of leafy ensilage now and then. My spring calves I keep in the barn all summer long and all the next winter. Don't turn spring calves out to fight flies, for the sake of getting a little green grass which will probably give them scours. Keep them in the barn all summer and feed them the same as you did in the winter and you have got a good calf at the end of six months.

SECRETARY'S ANNUAL REPORT.

To the President and Members of the Wisconsin Dairymen's Association: I have the honor to submit the following report for the past year.

The total expenses incurred since our last annual convention, which was held in Platteville last February, amount to $3,378.49, and may be classified as follows:

Convention expenses	$414.29
Convention premiums	196.40
Cheese instructor (Aderhold)	1,087.00
Creamery instructor (Corneliuson)	876.00
Swiss cheese instructor (Marty)	785.00
Swiss cheese expenses	19.80
Total	$3,378.49

In addition to the above the instructors collected from cheese factories and creameries $313.50, which was applied directly on their per diem and did not pass into the treasury.

There is in the treasurer's hands at this date, if there are no errors in my account $1,354.07, with which to pay the salary and expenses of the secretary $303.27, the W. D. Hoard Co.'s bill for printing programs and other items $26.10; the expenses and premiums of this convention, which may reach $750 to $800. This will leave a probable balance in his hands of about $200, besides what may be collected for annual memberships at this convention.

We have had but three instructors in the field during the past year and the foregoing finnancial statement explains why more were not employed. There was no money available to pay them.

I believe these instructors have been doing better work than ever before, but when I look over the field and see how much ought to be done in this line, and how little it is possible to accomplish with the meager force at command I am well nigh discouraged. I had hoped that the present legislature would con-

sider this problem and do something towards putting Wisconsin in line with neighboring and competing states, but I see no indications of any disposition in that direction. Possibly a resolution on that subject expressing the views of this convention would not be amiss.

I trust it may not be considered presumptuous if I add a few words personal. I have performed the duties of Secretary of this Association for nearly eight years, much of the time at some sacrifice of that relief from labor which advancing years and a multiplication of other duties invite. But I have greatly enjoyed the work and have allowed myself to believe that it has resulted in some benefit to the dairy interests of Wisconsin. I realize that it is usually considered ungracious to decline what has not been tendered, but I have been the recipient of such favor from successive annual conventions of this association that it does not appear to me to be improper to request that my name may not be considered by your committee on nominations or by the convention when officers are to be elected for the ensuing year. My heart overflows with gratitude for the past, and I trust it may be practicable for me to meet with you in future conventions, relieved of the care and anxiety inseparable from official responsibility.

Respectfully,

GEO. W. BURCHARD,

Secretary.

On motion of Mr. Emery, duly seconded, the report was adopted.

Ex-Gov. Hoard offered the following motion:

"I move a special vote of thanks on the part of this Association to Secretary Burchard, for his faithful, earnest and zealous discharge of his duties, as Secretary of this Association.

Motion seconded and carried unanimously by a rising vote.

Adjourned till 10 o'clock next day.

FRIDAY MORNING SESSION.

February 10, 1905, 10 a. m.

The President in the chair.

THE CLOVER BELT AS IT WAS IN 1850.

Hon. John C. Clark.

Mr. President: I am very sorry that I am unable to be with you on this memorable occasion, as I would be glad to see many old friends and acquaintances of days gone by. Having been appointed as the Antiquary to tell you of the last sixty years' progress of Wisconsin grasses, my friend, Mr. Rosenberry, will read and tell you my views, recollections and knowledge which I trust will be of interest to all of you.

Friends and Fellow Citizens of Marathon County and Wisconsin: It was a great surprise to me that I should be invited to address a lot of farmers and dairymen on the subject of grass, clover and timothy, or any other subject unless it pertained to lumbering, from the forest to the mill, through the mill to the raft, the raft down the river over the wild Big Bull Falls, over the raging rapids of the Wisconsin, then on down its crooked and winding way, among the sand bars and shoals, to the Mississippi and a market for our lumber, which occupation and business I followed from 1845 to 1884, commencing as a cook in a shanty, and ending as a manufacturing lumberman.

These things might be told of with incidents that might be interesting as history, but would be useless on the cow question, but I will do what I can for the grass and the clover.

THE STRUGGLES OF THE EARLY PIONEERS TO GET INTO THE WISCONSIN VALLEY.

This country was a dense and unsubdued forest from the place where Stevens Point is located to the shores of Lake

Superior on the north. To open up the country for the business of lumbering was no child's play, but was work for men of stalwart bodies and determination of mind. Such were the men who opened this vast expanse of territory.

When George Stevens started from Belvidere, Ill., with three ox teams, to come here in 1840, it was mostly prairie land to near Fort Winnebago; from there on to Stevens Point, were oak openings and sandy plains, with a trail made by the Indians to Point Bausee, where Whitney built the first lumber institution in the valley. Thereby Point Bausee became the basis of all migrations to the north. It was at the head of navigation, being at the foot of the long series of rapids on the river.

There the Menominee Indians would gather at times for their hunting and fishing expeditions. In 1848 there were over five hundred Indians, with Chief Oshkosh at their head, holding a pow-wow, or council, over the sale of their reservaton to the government. Their lands extended from about Fort Winnebago to Big Bull Falls on the north, and from the Black river on the west, to the Fox river on the east. This region was covered with heavy forests. The wealth in the magnificent pine was as alluring to the pioneer, as ever the gold fields of California were in 1849. The question of how to get at it to make it marketable was the absorbing thought of all minds. Migratory pioneers are not generally the possessors of much, if any, ready money. All the wealth they possessed was stout hearts, strong muscles, and common sense, with physique enough to knock a bull down. Such were the men that first tackled this great forest.

With their means, it was out of the question to open roads to the several water powers where saw mills were to be erected, as there was no money to build them with, so log canoes were hewn out of the woods and supplies of every name and nature that were necessary for their sustenance were boated by the canoes in summer season, and the ice on the river furnished the road in winter, upon which supplies were fetched into the country. At this time, there was but one house between Madison and Fort Winnebago, and but two houses from the Fort to Point Bausee, which were kept by men who had Indian women for wives. The population in 1845 of the valley from Point

Bausee in the whole pinery was only three hundred, about all men, with about twelve or fifteen women.

The reputation given the country by the traders of the American Fur Company, was that the land was stony, sandy and barren, mountainous and marshy, cold and unhealthy and not fit for farming, or ever to live in by civilized people; and that was the impression of the lumbermen for many years. They thought that all the lands that would pay them to cultivate, were the islands in the river, and the bottom lands on the banks, which grew blue joint and red top grasses, where the hay used by the lumbermen was cut. They soon found that the high grounds would raise hay and potatoes, if nothing else.

When the logging roads were cut, to draw the saw logs to the river, horses as well as oxen were used. The horses manured the roads and in the spring timothy and clover would spring up as thick and straight and stout as it ever did in any meadow.

Here I would relate an incident that occurred in 1844.

Two yoke of oxen strayed away from home on the west side of the river. They had been gone several days, and two men, Martin Lynch and another, were sent to hunt them up. After the oxen had entered the forest a few miles, they lost their bearings and got bewildered and were lost. They were gone two weeks and had nothing to live on with them, but the luscious blue joint grass which kept them in good order and fat enough to butcher for beef. Lumbermen, as soon as the snow was gone in the spring, would turn the cattle out to get their own living, and in a month or so, they would be fat enough for prime beef. I relate this to show the fertility of the land in the growing of grasses.

But it took several years before the clearing of the hard wood ridge was tackled. The Marshall farm was about the first. Benjamin Single, Joe Briggs, Jos. Dessert, James Moore, Ben Barry, H. Pearson, Abraham Bradley, Ed. Armstrong and W. E. Maine cleared land on the hardwood ridges in the later forties, and the early fifties. After these men showed their success, many others followed. In 1855 the German immigration commenced and their number has increased ever since, especially since 1870, until nearly one-half of the country is German or of German descent. They are a good class of people; patient, industrious, frugal, honest and trusty. No more

can be said of any people. We have also a large class of Irish settlers, who are as good a class of people as any in Wisconsin. The Poles in the western part of the county, are good farmers, and home builders, but rather clannish, in their ways and living. All these people on the farms grow all kinds of crops. To enumerate them would take a farmer. A walk through our exhibition on fair day tells more for the glory and honor of the soil than can be done by any tongue or pen.

The county today with its lovely and beautiful Wausau, surpassing every other city in Wisconsin of its size, with its fine schools, churches, public library and dwellings is the pride of every citizen within its limits. In the country, wherever you go, you find growing villages with schools and churches. The farms you pass by have fine stables, homes and barns for horses, and the fields are well cultivated and beautiful to look upon. What a change in one short life, from a howling wilderness to a lovely, beautiful Eden, where peace and tranquility reign and everything is lovely.

THE CLOVER BEIT AS IT IS IN 1905.

John F. Lamont.

My friend, Mr. Clark, has told you in an entertaining way of the clover belt before the white man knew that this could be developed into a profitable agricultural region. It is fit that I should take a little of your time in paying a tribute to the class of hardy pioneers represented here by Mr. Clark. They came to this section when only men of sterling character and tried worth could withstand the hardships incident to the development of this magnificent heritage, then so far removed from the comforts and prosperity of a developed civilization. All that we of this generation have today is due to their foresight, industry and persistence. They brought to this valley the present means of transportation and all the methods of developing our natural resources. Many of them sacrificed without pe-

cuniary gain, their health, their worldly comfort and their possibility of material wealth to give to us title to one of the most magnificent properties that the sun ever shone upon. All honor is due them and no man took a more important part and no name is better and more favorably known in the historical annals of this region than that of John C. Clark.

When I speak in this paper of the clover belt I have in mind all of that territory which lies between the valley of the Black river in Clark county on the west and the boundary line between Shawano and Marathon counties on the east; between Grand Rapids on the south and Medford and Merrill on the north. We learn from a survey of the soils made by Dr. Samuel Weidman that there are in general two great areas of different kinds of soils in this belt. They are named by him the "Colby Clay Loam" and the "Marathon Loam" the former covering about four-fifths of the territory described. The Colby Clay Loam is described as a heavy soil, uniform in texture and composition, and is a result of the glacial action of the Great Ice Age. It being in what geologists term the "Old Drift," there are no lakes, basins or swamps. The ground is well drained and gently rolling. Dr. Weidman tells us that this drift has been weathered to appropriate material for soils to a depth of from two to ten feet and that the surface is enriched by from six to ten inches with abundant decayed organic matter.

His further statement is that, "The deep weathering of these old drift formations forming the Colby clay soil makes them of especial value to agriculture. Similar soil conditions prevail here as upon the old drift formations which constitute the richest agricultural regions of Southern Iowa, Northern Missouri, and Northwestern Kansas. This Colby Clay covers an area of about twenty-three hundred square miles.

The Marathon Loam has many characteristics of the Colby Clay but it is a lighter clay soil. We find in the Marathon Loam a few boulders and some gravel. It is residual soil, derived almost entirely from the decomposition of granite, greenstone and other crystalline rock. It was covered with a heavy forest growth and has an exceedingly rich top soil.

In the narrow valley of the Wisconsin we have a sandy soil owing its origin to the accumulation of successive layers of

gravel, sand and silt deposited by the river floods during the glacial period. It has been described as being similar to the truck soils of Maryland, New Jersey and Long Island.

In connection with the soil of this region we must take into consideration the climate, if we are to discover the reason for the wonderful growth of clover. Again I quote from Dr. Weidman who made an extensive study of the clover belt. His theory is, "That the weather conditions of the area are modified appreciably by the two great lakes, Superior and Michigan, on the north and east. Neither of these lakes freezes over in winter and because of their large area, 32,000 and 22,400 square miles, it is evident that whenever winter winds come from their directions both their temperature and their humidity are increased. In like manner, during the summer months the lakes tend to make the air cooler whenever the winds come from their direction, for the body of Lake Superior rarely reaches a temperature higher than 46° F. and much the same conditions hold for Lake Michigan."

The average annual rainfall for ten years from 1892 to 1901 is given as 30.6 inches, and for the same period for the growing season from April to September is 21 inches. An extended season of drouth in this section has never been known. Dr. Weidman's final conclusion on the climatic conditions is as follows: "In the matter of a larger development along already well established lines of agriculture, such as dairying, climatic conditions are especially important. In the dairying industry a comparison of the climate of the northern counties with the southern counties of the state and with the dairying sections of the country shows this region to be especially favored. Throughout the growing season of the year, in the area here decribed, there is sufficient fall of rain to cause a continuous growth of nutritive grass for grazing purposes, and the climate is sufficiently cool to produce the best flavored milk, a highly important factor in making the best grade of butter and especially important in the production of the best flavored varieties of cheese."

I am now about ready to submit to your verdict the query that with a soil of this character and a climate that could not be bettered for the growth of forage crops have we not an ideal condition for the development of one of the greatest, if not the

greatest, dairy section of the country? Clover is listed as the greatest of all forage plants for the dairy cow, and here it grows not only abundantly but with a luxurious extravagance that is beyond the belief of any man who never gave this secton close study. And what a wonderful plant it is! It gives you twice the return in fodder that timothy does and at the same time enriches and puts into the soil elements necessary to the growth of any kind of crop. While its top is giving forage, its roots are working overtime storing the nitrogen so necessary to the soil. No farmer who persistently and intelligently grew clover ever had a worn out soil.

To one who takes the matters I have outlined and present conditions into consideration it will seem strange that the farmers of this belt did not earlier turn their attention to dairying, but it must be remembered that until within the last decade the principal business of this section was lumbering and that we are comparatively new as an agricultural community. Not many years ago the lumber camps furnished markets for hay, pork and potatoes and the farmer clearing up the new farm grew that crop which quickly and surely brought him cash for his labor. With the exit of the lumberman came the entry of a new kind of farming and we were not long in learning that there was a great market away from home for the staple that we were in the best condition to produce. With this new knowledge has come a desire for improved stock and here and there throughout this territory has been built, almost in a day it would seem, many cheese and butter factories, until we have in every town a place for marketing the milk where it can be manufactured into cheese or butter. Fifteen years ago there was hardly a factory in this whole region. Fifteen years from now there will be a factory or a skimming station at every cross roads.

I have made some effort to get a systematic report from each town clerk in Marathon county as to the location of the creameries, cheese factories and skimming stations in the county and the map will give you some idea of how this industry has grown. The products of these factories go all over the United States. One butter factory near Edgar ships its entire output to Washington, D. C. Others have an established trade in other cities in the east. But little of the butter produced is

handled by the jobbers in Chicago. This does not seem to be as true of the cheese factories. Much of the cheese seems to be shipped under contract and the boxes are marked with the name of some large Chicago firm before leaving the Marathon county factory. So much faith have I in this territory that if I were the boss every package of cheese or butter shipped from this belt would be so labelled that every observer would know just where it came from.

There is a cheese factory near Colby that has earned a reputation all its own and so well is it known on the market that all the factories in that vicinity have taken advantage of its good name and any package marked "Colby Cheese" brings a ready sale and the top price. The Steinwand factory was established many years ago and was among the first that was put upon a paying basis in this section. I am informed that great care was taken in the manufacturing of its cheese from the start and today its whole output is handled by one of the largest grocery houses in Milwaukee and commands a price which is always above the market quotation.

But my time is up and I must hasten. To discuss the evolution of the small farm dairy into the co-operative creamery would be a waste of time. You doubtless know more about it than I do, and I presume our history in this respect is not essentially different from the history of the development of other dairy sections.

If I had the time I might tell you of the efforts made to get better stock into the country and the work of educating people to an appreciation of our possibilities, of the influence of our fair, and of our county agricultural school in this respect.

I will only say that the clover belt today, with its wealth of cleared farms, rich soil, excellent farmers and enthusiastic citizens is only a beginning. Its future is assured and it is destined to become the richest and best known agricultural section of this splendid state of Wisconsin. Go where you will, you cannot find a richer soil, a better climate nor a more industrious class of citizens, and some day, and that before we are much older, the farm property now on the market in the clover belt cannot be bought for love or money. Here no man will ever be lost in a blizzard, and no crop will ever die for want of water, the locust and the army worm will find sustenance further west.

This will be a land flowing with milk and honey, populated with a contented people richly endowed by nature with her greatest gifts, a heritage unrivalled, the pride of the Badger State.

DISCUSSION.

Mr. Rietbrock: Inasmuch as Mr. Lamont is our Superintendent of Schools and has been for ten years, he is the man of all men that can tell us something about this question of agricultural schools.

Mr. Lamont: During the past six or seven years throughout the state of Wisconsin there has been something of a movement toward infusing a knowledge of agriculture into the rural schools of the state. That movement was led by the state superintendents of the past twelve or sixteen years and reached its highest development, I think, about three or four years ago. We have done what we could. You remember that teachers some four or five years ago were required to pass an examination upon elementary agriculture. That had but little effect, because most of the teachers have had no opportunity of getting the preparation necessary, except in those counties that have county training schools where they have some facilities of that kind. But it is not practical, because we have not the tools with which to work. We have not the sentiment among the farmers themselves to have that introduced, but we have done all we could in that direction and the movement has grown from year to year, and I fully expect that within the next ten years we will have more and more of it.

The Chairman: Mr. Lamont spoke about the Colby club cheese factory. We have that on our table at home, and it is the best cheese we can get and we know where we can get it. What this factory has done in building up a reputation for itself, other factories in Marathon and adjoining counties might do.

Mr. Emery: The remarks that Mr. Lamont made in regard to getting statistics of the dairy products of the county appeals to me. Two years ago we undertook to provide a law

by which we could ascertain accurate statistics in dairy products, but the reports that have come in have been disappointing. The law required the assessors in the respective towns, cities and villages where factories are located to make reports as to the names of these factories, and the output of the factories. But few of the counties have given accurate statistics, while others are worse than worthless, and I deem it a great misfortune that we can secure no accurate statistics in this great dairy state. In Minnesota and Iowa they seem to have no trouble, the great state of New York has accurate statistics, but we, so far, have been unable to obtain them.

Mr. Curtin of Calumet county has introduced a bill in the legislature, requiring that all cheese factories in the state shall obtain a stencil from the Dairy and Food Commissioner, for which they are required to pay one dollar, and they are required to stencil the cheese manufactured in their factories, providing it is up to a certain standard, but one proviso is that they shall not stencil any that is made from unclean or unsanitary milk, or made in factories that are unclean or unsanitary, so that I anticipate there will be a large number who will know that they cannot stencil it. Upon the other hand, there is a law making it an offense, to be punished by fine or imprisonment, for receiving milk that is unclean or unsanitary and manufacturing it into food product, and also for keeping an unclean or unsanitary factory, so I don't know but we shall catch them coming and going. We ought to, for there is no one thing so important to promote the best interests of the dairy work of this state as to get a higher degree of cleanliness in the milk furnished to factories and in the factories themselves. Another law that Mr. Curtin is interested in, and he has good sentiment in the legislature back of him, is to require that the Dairy and Food Commissioner, on application, shall send an inspector to warehouses where cheese is stored, or is in curing rooms, or other dairy products, and score those dairy products, and that that score shall stand in the courts as the official score. These are all pretty strenuous measures, but they seem to be in the line of dairy progress and if we all work together to promote the better dairy interests of the state, there is a wide opportunity for progress along the line of quality. It has been mentioned here that Minnesota was ahead of Wisconsin at the

St. Louis fair. I believe that in the matter of the selection and the care of dairy cattle, as well as the breeding, Minnesota has much to learn of Wisconsin, but when we come to the creamery interests, Wisconsin can learn a great deal from Minnesota. Many years ago, early in our history, we won great prizes and we have been rather resting on our oars, we have been proclaiming ourselves a great dairy state and feeling great pride, but this attitude is never promotive of progress. What we need to feel is that there is a great opportunity for us to improve, and especially along the line of cleanliness in these products, and this is the first essential to quality.

Mr. Lamont: I don't know much about making butter and I know less about making cheese, but when I go out through this county and find stacked up on the depot platforms whole carloads of boxes marked to be sent to Crosby & Meyer of Chicago, Ills., I can't help but think that if it is good cheese, these parties are putting on the market, it ought to be marked and credited to Marathon county or Clark county or in some way designate where it came from.

Mr. Emery: That is true. Some of our best butter never reaches Chicago under any distinguishing name. It is labeled "Fox River Butter Company," and Wisconsin gets no credit for that best quality of butter. It is the poor butter that gets on the market and we get the credit for that. It seems to me that the better quality—all qualities should be labeled, stamped, marked.

Mr. Aderhold: Don't you think that the dealers would object to that?

Mr. Emery: I presume they would, but isn't that in the interest of the purchaser, that their wishes should be consulted?

Mr. Aderhold: If they can get just as much for the poorer quality somewhere else, it is not.

MAKING MILK IN WINTER, ITS ADVANTAGES AND DISADVANTAGES.

F. H. Scribner, Rosendale.

A man to be successful in winter dairying must have at least three faculties,—First, a faculty of caring for cows; there is no place in the dairy business for the careless, slipshod workman. Second, he must be a good business man, and third, he must be naturally neat. Man found the cow a mother only, and by his direction of her tendencies he has enlarged her into a profit maker long after the period, she in her early state was concerned in supplying sustenance to her offspring.

This new life and widened usefullness of the good cow, to me is a great privilege and one of the most beautiful accomplishments of man. In nature we find, as a rule, the cow a mother only in the spring when the weather and feed are most conducive to the rearing of the young, but man with his greed for gain, has changed the order of things and found that more profit can be obtained by having her freshen in the fall, and he is indeed a wise man who realizes and meets all the needs of this new creature that has come under his care.

One of the most efficient means of increasing the productiveness of the cow, is to lengthen her milking period. The cow that freshens in the spring milks well for a while and when hot weather and flies come naturally dries off, and by fall is practically dry. The fall cow with good care and feed milks well through the winter and when spring comes with its balmy air, and rich milk producing feed, again freshens as it were, and is practically as good as a fresh cow and will milk well till flies and hot weather come, and then is ready to dry again, which means as a rule that we have lengthened her milking period about two months.

This ideal cow of ours will have the best of care at all times, be regularly fed, watered and milked. I should want this cow in winter time to have a good comfortable stall, wide enough so she may lie down with ease, and not so long that she cannot be kept clean. The temperature should not go below freezing, and the ventilation especially looked after. I believe it is

beneficial for every animal to take a little fresh air every day, unless the weather be too disagreeable. Realizing that we are breeders as well as milk producers, and that the constitution is a great factor in either, so ours are turned out every day while the stables are being cleaned and bedded.

She should be consulted as to her bill of fare. A variety is always desirable, and the digestibility of foods should always be considered. The clover hay should be cut at the right time and properly cured. Don't palm off onto your cows hay that has been cut after the blossoms have left it.

Ensilage of course is par excellence, and I believe has been a great factor in the development of the dairy cow of today and also in the economic production of milk. Many a cow with fair results could be made to produce double if she had the proper material in the shape of food to work up into milk. The machine may be all right but the material all wrong. We must have both to have success, so I class ensilage first in the ranks of economical feed stuffs. She must of necessity consume large quantities of nutritious feed if she gives a large and paying amount of milk. She cannot consume dry feed enough and digest it, to work her milk-producing power to full capacity. Without succulent, easily digested foods, her digestive machinery is overtaxed and she does not thrive and produce to the limit of her capabilities.

But this I say, "He which soweth sparingly shall reap also sparingly; and he which soweth bountifully shall reap also bountifully."

The grain ration is where a good many fall down. We ought to remember it is on the amount fed over and above actual maintenance from which we are to derive our profits, and that we must feed with a liberal hand. All there is of profit in such an animal, aside from her calf, lies in the balance left after furnishing her a living. So it behooves us to make this living as comprehensive, and at the same time as cheap as possible.

A good many are trying to make milk without protein, and I want to say right here "It can't be done." I believe we should feed protein wherever we can buy it most cheaply, whether in the bran, the gluten or the oil meal. It is the feeder's business to study the animals under his care, and if he does this he will be able to tell how much to feed. If a cow

is in full flow of milk and does not lay on fat, her appetitie will be a good guide to go by. Let her have all the grain she will eat up clean and she will make good use of it.

One of the greatest drawbacks of really profitable winter dairying is that many keep their cows so poorly through the summer that it takes half the winter to get them into working condition, and a part if not all the profit is lost in so doing. It is an old and true saying: "An animal well summered is half wintered and well wintered is half summered." It seems indeed very short sighted to see a herd of cows in July and August on short pasture, hardly fit for a flock of sheep, and this their only means of maintenance. If enough ensilage has not been stored for this occasion, a series of soiling crops should be grown that shall insure their continued profit through the entire year. If our dairies are to be run as profitable yearly enterprises, guarding against any period of under feeding during the year must have our most careful attention.

So far through my paper the most significant theme has been the feed question. No matter how skilled we may be in breeding and making nicks, crosses and out-crosses, and we may mark the pedigrees all over with red ink, but after all, the main thing with the cow is her feed, and unless she and her offspring are fed enough and well, the granddaughter will be a scrub and dear at most any price.

A good dairyman does not chance to have good cows. It is with him a business proposition, and he fully understands the necessity of good blood linked together with good feed and care, and also knows the necessity of rearing the heifer calves in such a way that they will be profitable producers.

I believe that a great deal of the discouragement to dairymen is that they are trying to do the work with the wrong kind of a machine, and the results they have obtained were not very flattering.

The special purpose cow is one means of securing success in dairying. The real value of a fine milch cow lies in her pedigree, her prepotent power of heredity, that power that a long line of good ancestors gives her to pass her good qualities along to her offspring; so that a great deal depends upon the man, as to whether he is wise in the selection of the kind of animal for

the work, and with the care and feed there is nothing to hinder the dairyman from being master of the situation and having conditions favorable to his ambitions.

DISCUSSION.

Mrs. Howie: What do you recommend for soiling crops?

Mr. Scribner: I recommend the silo above all things. If a man has a silo, he has everything there convenient, always ready. Of course I realize that the state of Wisconsin is, as a rule, destitute of what we call good summer soiling. The first thing would be to supply something that they can use for a soiling crop. I received a letter from a man in the southern part of the state, saying that his clover was gone, that he didn't want to buy bran, and gluten was too expensive, and would I advise him what to grow for the next summer. Well, I was hard up to answer him.

Mr. Howard: Wouldn't you advise putting in a few acres of alfalfa?

Mr. Scribner: Of course alfalfa is an uncertain quantity yet in Wisconsin. If you can get it to grow, you will have a fine crop of milk producing food. It would be well for every farmer to try a little patch and learn how to handle it.

The Chairman: If Mr. Howard hasn't got silage, what could he plant for rotation and soiling crops?

Mr. Scribner: I should in the fall grow a small piece of winter rye. That will last you two weeks, probably three. Then I would sow as early as I could get onto the ground some peas and oats, and if you are successful in raising clover, your clover will begin to come on about that time, and of course there is nothing better. Plant some early corn and have that.

Ex-Gov. Hoard: About what time do you find that cows begin to shrink and need the soiling crop?

Mr. Scribner: Well, it is usually about the last of June or the first of July. I tell you the flower of the season lasts but a little while. We get our best results only a very short time, I don't believe more than six weeks, so we want to prepare for these occasions. I never found the time yet, I don't care how

good the year was, but what we had a drought some time of the year, and we always want to prepare for it. That is where we as dairymen have been very lame, in allowing our cows to go down. When they begin to shrink on their milk, we want to look out for it and we can always tell if we look out in the right way. I don't believe there is more than one man in fifty that has a milk sheet in his barn, and he ought to have it, then he will know. If we don't weigh our milk, we can't realize it, and if we do weigh it we can tell in an instant whether a cow is shrinking or not.

Ex-Gov. Hoard: It is not alone for just during the summer that a cow should be kept up, but it is for the sake of getting a larger flow of milk in the fall when milk is higher.

Mr. Scribner: Yes, we should not allow them to shrink through July and August, because we want them to give milk in the fall and through the winter, when the prices are always highest. Butter now is thirty cents a pound. We wish we had a lot of it, and we can only have it by planning for it; have our cows freshen in the fall. I believe a man can make at least twenty-five per cent more out of his cows by having them freshen in the fall than in the spring. We like to have them freshen in October. At that time we are in shape to take care of them, we have got a good deal of our fall work done, we can feed them better, and as soon as we get our cows into the barn on our winter ration, we know just what we can do then if we have got the right kind of feed. We ought to feed more silage; if I lived here in Marathon county, I should have a silo above all things, because the corn crop is so uncertain here in the northern part of Wisconsin and if we have the silo we can get the very best results.

The Chairman: What happens to a cow when you turn her out to grass in May after calving the first of November?

Mr. Scribner: We find that they revive up in their milk and I think as a rule the yield is higher at that time than if they had freshened in the spring, and we get just about as good results.

Mr. Howard: Do you think the average farmer will do better to have his cows freshen in the fall than in the spring?

Mr. Scribner: I have no doubt of it. It is the very worst thing I know of to put a young calf out on pasture in the

spring. Skim milk and grass do not make a good combination. The stable is the best place for the calf. If they are fed on good skim milk and you have your clover hay and oats you can carry them over the winter and by spring they are old enough to go out on grass, but even then our calves are kept in and fed milk up to a year old.

Ex-Gov. Hoard: Do you use a separator on the farm?

Mr. Scribner: Yes, and I use the separator skim milk for our calves and I have never found any better use for it than to put it into calves.

Mr. Emery: You spoke of the silo for the purpose of getting corn in ahead of the frost. Do you recommend unripe corn for the silo?

Mr. Scribner: By no means, but it is the next best thing that we can use.

Mr. Goodrich: You save all the feeding value there is in the corn in that way.

The Chairman: The point you make is that the silo will not make unripe corn equal to ripe corn, but it will make it better than any other process.

Mr. Scribner: I would like to ask all the gentlemen in the room who have silos to hold up their hands. Well, there are a few, and I am glad of it. Now, how many in Marathon county? There are six. That is a splendid good showing.

Mr. Rietbrock: And I think there are two that are not here.

Mr. Jacobs: If your cows are spring freshened cows, do you think it is a safe proposition to carry them over and have them give milk long enough so as to come in a year from the next fall?

Mr. Scribner: I wouldn't do it all in one year, I would divide the period up and be two years in making the change over. Commence with the heifers, milk the heifer a long time the first time, milk her a full year or more, and then the next year you can change her over. Of course, there is no time of year when a heifer will do as well as to freshen in the spring, because the grass and everything is conducive to making her give a large flow of milk. We want to have practically the same kind of food to encourage her to make up a good udder and give a large flow. We are not letting our heifers freshen as early as we used to, which was at two years, and I would do that yet

with a common heifer, but for strictly dairy breeds I believe two years and a half is all right. They have a stronger constitution and better udders. We have two heifers this year that have made over 500 pounds with their first calves. They must have lots of constitution, because we are going to ask a big lot of work from those heifers, and I believe if they do not freshen too young they will have more constitution.

Mr. Wright: There are a number of our farmers near the city who are feeding pea silage from the canning factory. They put it up in a big stack and then they sell it out in sections, and some of them have asked me what to feed with that to make a balanced ration, something in the way of dry feed. I would like Mr. Ditzel to tell about Albert Johnson's experience; he is feeding pea silage and he is getting more milk than any other man on the road.

Mr. Ditzel: All I know about is that Mr. Johnson claims he feeds nothing but pea silage. He claims he hasn't fed a bit of hay with it.

The Chairman: What grain does he feed?

Mr. Ditzel: I don't know whether he feeds any grain or not.

Mr. Goodrich: Peas have about the same amount of protein that alfalfa has.

Mr. Scribner: I wouldn't want to depend entirely upon peas for a ration. It would be like feeding ensilage; we make a mistake if we allow our cows to eat ensilage only. They crave something else, they must have some dry feed in order to do well. So we feed some dry hay and feed liberally with grain. Bran is principally our ration, with gluten meal or gluten feed.

Mr. Howard: I have a friend about ten miles from Eau Claire and they have got a canning factory and there are a good many peas left in that ensilage. They feed oats and bran together and some marsh hay, and they claim that they eat the marsh hay a good deal better then they did before.

Mr. Quaw: I think it would be a benefit to some of us who have not got silos but intend to build, to know the best condition of the corn crop to put in the silo to make the best quality of ensilage.

Mr. Scribner: Well, the time that I should begin to cut it would be just before you would cut it for field purposes. That

is the time when I believe it is in the very best condition to get the most out of it, not only for the corn but for the fodder itself. If we were going to cut it to get the most value as fodder, we would get a little bit on the green side; if we wait too long, it will get too hard, woody. Otherwise, if we cut it too much on the green side, we will have a poor quality of silage, so there is just the happy medium just before the corn is fit to cut for field purposes, and then put it in as quickly as possible.

Mr. Rietbrock: Your answer leaves us a little bit in doubt, because we have first to find out when it should be cut for field purposes. I have heard it said that the right time to cut it would be when Dent corn is just denting, coming out of the milk and into the glazed stage.

The Chairman: It will help it still more to say, perhaps, when the husk begins to turn yellow.

Mr. Scribner: That is good. We go into a field and examine the ears and perhaps we will find one quarter of the ears have become dented and then is the time we commence to cut for the silo.

Mr. Rietbrock: Will you explain just what you mean by "dented"?

Mr. Scribner: Some of these city men don't know much about corn.

Mr. Goodrich: I have got a kind of a notion of my own about that. My test is when the lower leaves of the corn stalks begin to turn yellow and when the earliest ears of corn turn white, and that would be just about as Mr. Scribner describes it. At that time it has the greatest digestible food value, taking the whole plant, the corn and the stalk together.

Mr. Scribner: There is a little difference in different years. You take exceptionally wet weather and we won't find these lower leaves turning yellow, because there has been so much moisture and the stalk is full of moisture and has not turned yellow, although some of the ears have begun to dent, so that rule would not apply every year.

Mr. Rietbrock: Then in an excessively dry year, those leaves will begin to turn yellow before the corn is dented?

Mr. Scribner: Yes, that is true. A man has to have good sense, use his judgment all through. If the leaves have turned white and if your stalks have begun to turn white, you can't

cut it any to quick. You must have a certain degree of moisture in there in order to get the best results.

Mr. Vanderblum: What kind of silage would corn make that the ears were just formed before frost?

Mr. Scribner: It would make a very poor quality of silage; it would be sour. A number of years ago we tried putting it in green and we found it very unsatisfactory, and the cattle did not thrive so well on it. When we came to learn more about silage, we found that the corn should be more mature and then we have sweeter silage for the cows and they thrive better on it.

Mr. Rietbrock: How is flint corn for silage?

Mr. Scribner: It is all right inasmuch as the corn would be very good indeed and there is a great deal of leaves on flint corn, but there wouldn't be so much of it.

Mr. Goodrich: In a latitude where dent corn would not sufficiently mature, wouldn't you advise raising something else?

Mr. Scribner: I would certainly advise a man to raise a corn that would mature in his locality, although you perhaps might not get so much to the acre, yet the quality would be enough better to make it up. Men are learning to grow corn. One great trouble in growing corn is that we do not prepare the ground. I think the ground should be prepared before you are ready to plant it, stir it up thoroughly and let the sunshine in to warm it. Fall plow it if you can. If you can't, then have fall conditions in the spring as near as possible. Of course, on fall plowed ground, we find it in a compact condition. You want to have that same condition in the spring, go on with your roller and pack it down, make it compact. Stir this land up, warm it up and you can plant corn sometimes a week or ten days earlier than if you let that ground lie in that condition without being stirred.

Mr. Rietbrock: If you turn over a clover stubble in the fall, would you plow that in the spring?

Mr. Scribner: No, I would go on with my disk harrow and stir it up.

A Member: Suppose your corn has become dry? Can't you supply moisture for that silage to make it heat up to the proper degree so that you will have sweet silage instead of sour?

Mr. Scribner: Yes, you can supply it and get fairly good

results, but it never takes the place of the natural juices in the stalk.

A Member: Sometimes your silage is too green, has too much juice in it. What would you do in that case?

Mr. Scribner: I don't know. Do the best you can, let it wilt and dry out.

Mr. Rietbrock: I have been told that in Canada when they get it into that condition, they put it into a pretty good sized shock and leave it there for a while until it is partly dried out, and then take is from the shock and put it in the silo.

Mr. Scribner: I doubt if it helps it any. We cut it right down and put it in the silo as quick as we can.

CARE OF MILK ON THE FARM.

Prof. E. H. Farrington, Madison.

(Prof. Farrington: There was one thing brought out yesterday that I would like to make a little more impressive if I can. From my experience as a student myself and my experience with students that I am teaching, I find that things that we see with our own eyes are the things that make the most impression, while those that we hear do not stay with us very long. There was a point brought out yesterday that I want to fix in your mind if I can, so you will take it home with you, because it is a very strong argument in favor of dairying. One of these charts of Prof. Beach's showed us that the manurial value of a ton of hay carried off the farm is $4.00, that is, that every ton of hay you sell off your farm carries off four dollars worth of actual manurial value. Now, on the other hand, it is a fact that the manurial value carried off a farm in a ton of butter is but fifty cents. If you will think about that and fix it in your memory, I think in the future it will have a tendency to make you hesitate to send off such large quantities as will go in the hay crop.)

This is a subject that will always be discussed at dairymen's

meetings because it has such an important bearing on the quality and value of dairy products. The same advice and directions are repeated each year and they are probably familiar maxims to at least one-half of every audience that listens to them.

At the annual meeting of the Illinois Dairymen's Association last month, the president of the Association, in the course of his address, quoted a few statements about the care of milk from a paper over forty years old. They were the same old story we are all familiar with, about the necessity of keeping dirt out of milk, and cooling both milk and cream if one wishes to keep them sweet.

Each generation travels over nearly the same path in many walks of life and the milk way is about the same now that it was in our father's time. A few things have been learned during the past forty years about the causes of defects in dairy products and some reasons why milk is spoiled by dirt have been discovered, but the fundamental principles regarding the care of milk are the same today that they always have been.

An enormous amount of milk is consumed in the United States every year. It is estimated that the milk sold from house to house amounts to the production of about 7,600,000 cows, and that used in butter making to 9,700,000 cows and in cheese making 800,000 cows.* It has also been estimated by the Illinois Experiment Station that the 2,000,000 people which live in the city of Chicago consume over ten tons of dirt every year in their milk. These figures are startling although they are undoubtedly true, and while a little filth dropping into the milk pail may not seem to amount to much to the milker at the time, it is contributing to the tons of dirt we are all unconsciously consuming in our milk supply.

HIGH PRICED MILK.

A realizing sense of the truth of such statements as the foregoing, as well as the frequent proof that contagious diseases have been spread by means of milk, makes people in some localities willing to pay twelve cents per quart for milk which they

*U. S. Dept. Agr. Farmers' Institute, lecture No. 1.

know is perfectly pure and clean. The increasing number of sanitary milk producing farms, where milk is simply protected from dust and dirt to such an extent that it will keep sweet for weeks, is certainly an indication of an advancement of civilization.

We all know that most of the milk brought to creameries will not keep sweet for more than one day in warm weather, and most of us know the reason why milk spoils so quickly, but we also know that it is not the fault of the cows; they are innocent of any wrong doing; it is the person that feeds and milks the cow that is responsible for the dirt in milk, and if the milk producer wants to get a higher price than he is now receiving, no matter to whom he is selling it, the surest way for him to accomplish this is to keep the milk clean. There is always a good demand for pure milk, and when a factory receives such milk the butter, cheese or household milk which it sells from its supply will be so improved in quality that a higher price can be demanded for it. Persons buying such milk will be glad to pay an extra price for it. This has been the case in many instances and the reputation of a farm or a factory that is based on the purity of its products is standing on a firm foundation; certainly everyone that is connected with such an enterprise may justly be proud of it. A reputation of this kind arouses an interest in one's work and puts the necessary effort to obtain it on a higher plane than that of mere drudgery.

If a number of farmers are sending milk to the same factory and the products of that factory are of unusual good quality, because of the purity of the milk received, the business is going to prosper and the farmers will receive the benefit of its prosperity; but when, on the other hand, the milk is dirty and tainted, the factory receiving it will soon go out of business because of the poor quality of its products, the farmers will have no market for their milk, or they will be obliged to send it to some factory where cheap goods are made and a second hand price paid for the milk.

DANGERS IN MILK.

Milk is one of the most nutritious and healthful of foods and it may be one of the most dangerous of foods. Many contagious

diseases are spread by milk. Germs or bacteria find in milk the best place possible for them to grow. After they get into milk the only way to check or stop their growth is to cool it to near 50° F. or heat it to at least 150° F.; the latter treatment will destroy nearly all the germs.

Many astonishing statements and sentences with long words in them can easily be reeled off on the subject of bacteria in milk, but it is sufficient here to say that the dust and air of most cow stables is loaded with bacteria, and when they get into the milk they multiply at the rate of millions per minute. This ought to be a sufficiently startling statement to cause the milker who has never heard it before to pause and consider his ways. His duty to his family and to humanity in general when he is milking is a serious matter. Is the air of the stable pure and free from dust during milking? Would he be willing and glad to eat a plate of soup while he is milking a cow? If not, why not? Isn't milk a human food and isn't the milk pail that is under the cow being filled with food for his table? I have known of a number of instances where a table was set in a cow stable, the ventilation was so good and the place kept so neat and clean that the most fastidious person could not object to taking lunch with the cows. There are not many such stables in the United States, but they are increasing in number every year and the owner of such a stable must certainly be proud of it. Are you proud of the place where your cows are kept and would you be beaming with smiles if the persons who buy your milk should call on you in the stables at milking time?

Many cases are on record which prove conclusively that milk has been the means of spreading such contagious diseases as tuberculosis, diphtheria, typhoid fever and scarlet fever. Such a possibility as this certainly ought to convince a milker that his work is a serious business and while he cannot see the germs that fill the air around the milk pail, he can at least take every precaution possible to keep the milk free from dust and dirt of every description while he is milking.

People who handle our milk supply may be divided into two classes—first, those who know how to take proper care of it but fail to do so, and, second, those who really do not know just what things ought to be done in order to keep milk in the purest con-

dition possible until it reaches the consumer or the factory which is to manufacture it into butter or cheese.

The first class of milk producers who know their duty but fail to perform it need preaching of another sort than I am able to give them. They need to experience a change of heart or of ambition. But I may be able to be of some aid to the second class by enumerating a few general directions that have been found to be of practical value for the care of milk at the farm.

CARE OF STABLE, MILK HOUSE AND YARD.

A *milk house* is a very necessary building or room for any farm. If you do not have one, plan to build it at once; place it near the well so that all the water from the windmill or some other power will pass through a tank in the milk house to the stock watering tank. This is a good arrangement as it keeps the cans of milk cool if they are set in the water tank.

Setting the cans of milk into the stock watering tank is not a good practice because the cans have no protection from the sun in hot weather or from wind and dust during any season of the year.

The cow stable ought to be whitewashed inside with a spray pump. This should be repeated from one to four times each year.

After cleaning out the cow stable, at least twice each day, sprinkle land plaster over the floor to aid in absorbing the liquid and in preserving the wooden floors; cement floors do not need plaster as they may be flushed with water from a hose. Cement mangers and iron stalls are now put into cow stables and are proving very satisfactory. Good ventilation, clean bedding and plenty of light and comfortable stalls are also necessary in the cow stable. Dusty bedding and any feed that is dusty will seed it with millions of germs and these will develop taints and defects that are not desirable. The number of bacteria in the air near the cow's udder while she is being milked has been determined under various conditions of bedding and after different ways of cleaning the cows; these showed that a great many more germs were present in the dusty air under the cow than that outside the stable, and that the bacteria increased in number with the dis-

tance of the bedding and the amount of manure left hanging to the cow's flanks and body.

Pools of standing water in the yard, around the watering tank or in the pasture ought to be drained or fenced off to prevent the cow getting into the stagnant water. When cows walk through such places more or less mud sticks to their legs and body making the milker a great deal of trouble when he tries to clean the cows. The dust from this mud finds its way very easily into the milk at milking time and helps to increase its weight but not its measure. Such milk sours quickly and the dangers from diseases are increased with the amount of mud in the milk.

Deep wells, springs, or running water are the best sources of supply for watering cows.

CARE OF THE COWS.

A large portion of the impurities which find their way into milk are brought to it at milking time. If the cows are not cleaned or brushed just before milking more or less loose hair and dirt fall into the milk pail. This can be entirely prevented by brushing and then washing and drying the cow's udder just before milking. In dairies where sanitary milk that does not sour for several days is produced, the cow's udder is always washed and dried immediately before she is milked; the milker then washes his hands, puts on a white suit and milks into a covered milk pail provided with only a small opening in the cover to milk into.

Careful work of this kind protects the milk from many impurities and it increases the consumer's desire for more milk when he knows that such precautions are taken against impurities getting into the milk. Many people undoubtedly would want milk to drink if they felt a greater confidence in the purity of the milk than they now have. Their knowledge in a general way of the barn conditions where many cows are milked is not apt to increase their desire for milk.

Some experiments made by Professor Beach in Connecticut showed that the amount of dirt found in milk when covered pails are used at milking time was about one-third as much as was found when milking was done in an open pail. The milk

pail cover excluded 63 per cent and the strainer used after milking less than 47 per cent of the dirt found in the milk when covers and strainers were not used.

Bloody milk and that from an unhealthy cow ought not to be used at any time. A case is on record where the diseased hoof of a cow caused a loss of about $18.00 per day at a cheese factory. The trouble was located by means of the Wisconsin curd test and when the milk of this sick cow was kept out the quality of the cheese made at the factory was as good as it ever had been and the loss of $18.00 per day was stopped.

Milk ought not to be used until about six days after calving and some authorities prefer not to use it for thirty days before calving.

Persons having any contagious disease ought not to milk or handle milk for others, and every milker ought to carefully wash and dry his hands before he begins to milk. Always milk with dry hands. This is so self-evident that further explanation ought not to be necessary.

CARE OF THE MILK.

Immediately after milking strain the milk through four thickness of cheese cloth or one of flannel. The straining ought to be done outside the stable and not behind the cows.

As soon as strained, cool the milk quickly to near 50° F. Sudden cooling helps to preserve the milk and gives it a very acceptable flavor under normal conditions. Failure to cool at once after milking is the cause of a great deal of sour milk.

Never mix warm milk with cold milk but cool both before mixing them. Warm milk will absorb odors more readily than cold and the growth and development of bacteria is checked by keeping the milk at a low temperature.

Some sort of aeration is very beneficial to either milk or cream. It helps the flavor of these products and if the aerator is thoroughly clean no harm can come from mixing milk with pure air. The aeration must be done in a clean place, free from bad odors and dust as the spreading of milk over so much surface as is necessary with many aerators subjects it to any contamination which the surrounding air may contain.

Aeration will aid in removing some feed odors from the milk and it is an easy means of chilling it immediately after milking.

There are three methods of aeration now in use to some extent. First, those which spread the milk out in thin sheets as it flows over their surface or divides the milk into many fine streams as it passes through them. Second, an excellent aeration is obtained by passing the milk through a separator. The cream and skim milk are mixed together as they come from the separator by turning the spouts of the separator so that the skim milk and cream will flow together into one can. By this process a certain amount of matter which is in suspension in the milk is also removed, and this together with the dirt in the milk accumulates in the separator bowl. Third, a certain amount of aeration may be obtained by dipping the milk or stirring it with a long handled dipper. This is something every milk producer can afford to do. The large cans of milk are commonly set into a tank of cold water after milking and the milk is dipped and stirred occasionally until it is thoroughly cold.

A great many kinds of milk aerators are on the market and probably the use of any one of them is beneficial to the milk.

Aeration is the only preservative that is permitted by law to be used in Wisconsin milk; the chemicals advertised for this purpose are injurious to the consumer's health and the addition of any of them to milk, cream or butter in Wisconsin is forbidden.

If milk is well aerated and thoroughly cooled it can be safely held in cans tightly covered, but when it is not aerated the covers ought not to be put on the cans tightly until it is thoroughly cooled. When warm milk is tightly covered it has a tendency to develop what is called "smothered" odor.

ODORS IN MILK.

A great variety of odors are more or less common to milk. Among them may be mentioned feed odors, barn odors, cowey odors and kitchen odors. The feed odors come mostly from musty or decayed feed, pasture weeds, wild onions, turnips, rape, silage, etc.

The feeding of some silage will not necessarily contaminate the flavor of milk. Sufficient proof of this is the fact that silage is being constantly fed to cows that are producing some of the

highest priced milk in the country and that which is much sought for by hospitals because of its purity and its wholesome flavor.

The objection to silage feeding in the majority of cases comes from the poorly ventilated stables. Milk will absorb the silage odor if it is present in the barn and for this reason it is necessary to have the silo closed except when silage is being taken from it at feeding time. All the waste silage that is not eaten by the cows should be removed and not left in the mangers or under the cows for bedding. When this is allowed the air will be so filled with silage odor that it will be absorbed by the milk at milking time. No trouble, however, will come from silage odor when the barn is clean and well ventilated and the silage is fed after milking. Turnips and rape may also be fed without transmitting their characteristic odor to the milk if fed after milking and in not too large quantities at first.

The objectionable flavors in milk that come from the cows eating musty feed, pasture weeds, garlic and wild oinions, are not so easily gotten rid of as the silage odor, and such feeds should be avoided.

The cowey, barn, and kitchen odors sometimes so prominent in milk may be removed to a certain extent by aeration, but prevention is preferable to a cure in such cases. Keep the milk out of these places and give it a chance to live by itself where it will not be contaminated by unprofitable neighbors.

When cans of milk are drawn any distance to a railroad station or to a factory they should be covered with a piece of canvass in order to protect them from dust and mud as well as from heat and cold.

If skim milk is returned in the cans to the farms such milk should be emptied out of the cans as soon as they reach the farm, because of the difficulty there is in washing the sour odor from cans if the skim milk is allowed to stand in them until it becomes sour. Washing the milk cans at the creamery and returning them empty to the farmers is an excellent practice. It will remove many causes of failures to make butter, cheese or cream of first class quality.

CLEANING DAIRY UTENSILS.

Milk sours so quickly and the sour smell is so hard to wash out that all dairy utensils ought to be washed very soon after they have been used. The best results are obtained by rinsing off the film of milk with cold water, then washing thoroughly with warm water using a brush to clean out the seams of cans, and finally rinse with scalding hot water and place in the sun or some dustless place to dry. Do not wipe milk tinware with a cloth, but let the rinsing water be so hot that there is no need of further drying than the evaporation of this boiling water.

The strainer cloth needs careful attention as well as the tinware. It should be cleaned and boiled every time it is used.

Anyone advocating the washing of any dairy utensils or machine only once a week is an enemy to the dairy business. Milk and cream cannot be kept in a condition suitable for human food unless they are produced from sound feed in a clean barn and handled in carefully washed utensils.

DISCUSSION.

Prof. Farrington: I saw down near St. Louis something different from anything I have seen in Wisconsin. The entire floor was cement, the gutters and mangers, everything cement, and from the gutters was a large tile that conveyed the liquid manure to a large pit out in the yard, cemented up so it was perfectly tight so that all the liquid manure was conveyed out of the stable the same as you would use a sewer out of your house and it was preserved there as something very valuable and then pumped out and distributed over the farm. I saw two of these and both those men said they would not take any money for that arrangement, and that it was worth more than the expense of the building and the labor of handling the manure. It seems to be the proper way of saving fertility and getting it back to the soil. I wonder if there are any of these cess-pools in this state?

Mr. Goodrich: Mr. Kingman had just that arrangement several years ago. He told me he took out this material in his fields with a sprinkler and just drove around over his pasture,

sprinkling it to see what it would do, and you could see those spots all summer long. In fact, he said he could write his name if he wanted to. I don't know that he did.

Mr. Jones: Mr. Rietbrock has just such an arrangement in Marathon county.

Ex-Gov. Hoard: Supposing a man does not have that arrangement and he uses plenty of absorbents behind the cow and takes up all the liquid in that manner,—he accomplishes practically the same purpose. This land plaster absorbs the ammonia and saves it and it can be hauled out onto his field.

The following scores of butter and cheese exhibited were read by the Secretary:

Cheese.

Exhibitor's Name and Postoffice Address.	Flavor 45.	Texture and stock 30.	Color 15.	Finish 10.	Total 100.
P. H. Kasper, Welcome	43½	29	15	10	97½
Cleaveland Creamery Co., Cleveland	43	29½	14	10	96½
J. F. Bachman, Fremont	43	28	15	9	95
Nick Grimm, Ringle	41½	28	15	10	94½
Aksel Bruhn, Spring Green	42½	28	13½	10	94
H. E. Baumann, Naugart	40	27	15	10	92

Average score, 94.9.

Butter.

Exhibitor's Name and Postoffice Address.	Flavor 45.	Grain 25.	Color 15.	Salting 10.	Packing 5.	Total 100.
W. J. Hynes, Evansville	42	25	15	10	5	97
A. E. Dixon, Evansville	41½	25	15	10	5	96½
Chas. M. Kates, Custer	40½	25	15	10	5	95½
J. E. Boettscher, Waukesha	40	25	15	10	5	95
E. A. Paddock, Elkhorn	40	25	15	10	5	95
Carl Bjerregaard, Oshkosh	40	25	15	10	5	95
Albert Ehrke, Amery	39	25	15	10	5	94
W. F. Krohn, Whitewater	38	25	15	10	5	93
E. L. Duxbury, Green Bay	38	25	15	10	5	93
James Van Duser, Hebron	37½	25	15	10	5	92½
Fred Rietbrock, Athens	37	25	15	10	5	92
Sunset Creamery Co., Sunset	36½	25	15	10	5	91½
C. F. Blend, Irma, Wis	34	25	15	10	5	89
O. E. Knoke, New London	34	25	15	10	5	89
S. Haight, Rockdale	35	25	14	9½	5	88½
Norman Ovitt, Black Creek	33	25	15	10	5	88

Average score, 92.63 points.

Recess to 1:30 P. M.

The convention met at 1:30 P. M., same day.

President Hill in the chair.

The Chairman: We will resume the discussion on Prof. Farrington's valuable vaper.

Mr. Aderhold: I want to ask Mr. Baer if he can tell us what is the effect of feeding rape to cows for cheesemaking purposes?

Mr. Baer: While I was connected with the Experiment Station, two or three years ago, we carried on a series of experiments in the manufacture of cheese from rape-fed milks and in every instance, in all those experiments, which ran through three years, we found that the flavor of rape was carried over barn; others were driven to fields of growing rape and fed there.

We tried feeding the cows before milking, after milking, and at the time of milking. Occasionally we would get a day's make of cheese where the flavor would not be pronounced until the cheese had begun to break down or cure, after a week or ten days on the curing table, but invariably we found that this rape flavor was imparted to the product when the milk was made into cheese. Oftentimes, we received milk from the barn in splendid condition; so far as we could tell from the taste and smell, it apparently was free from the rape flavor or odor, but after a time, when the cheese began to cure, they would develop a bitter flavor to the taste and it would resemble a cheese made from—I don't know that that illustration will mean anything to you, but I was going to say that the cheese would smell to the expert judge as if it was made from milk where the animal had been fed on cabbage. It had an old, musty, cellar odor to the sense of smell, and as the cheese ripened and cured, it would taste somewhat bitter.

Mr. Emery: I would like to ask Prof. Farrington whether his statement as to making butter from cows where rape had been fed was made as an opinion or from experiment?

Prof. Farrington: We did make some butter from milk from cows that were fed rape, quite a number of times and we offered the samples of butter, sent them to Chicago to commission men to be scored, and they did not select out the samples of butter that were made from this milk from cows that had been

fed rape. The butter, of course, was consumed very soon after it was made, and may not have had a chance to develop a flavor that might possibly develop if kept longer from the milk. I think the flavor is less liable to be developed in butter than in cheese, because butter is consumed much more quickly, and while it is not safe, perhaps, for every one to feed rape, where the milk is to be sent to the creamery, you can feed it and it will have no very bad effect on the quality of butter.

Prof. Humphrey: I think that is true of any kind of feed that produces peculiar flavors in milk. I remember a case at De Pere where a creamery lost considerable money from milk from cows fed on cabbage. I have known of cases where the product scored very high, where I knew that the cows were fed cabbages, but they were fed in small quantities in the barn. I do not think we could cover up the flavor in milk where the cabbage was used in large quantities.

Mr. Aderhold: Prof. Farrington mentioned in his paper that if a stable was not well ventilated, the silage odor might get into the milk. Now, you take such a stable as that, not well ventilated, if it has not got the silage odor, what kind of odor has it, and isn't it worse than the ensilage odor?

Prof. Farrington: I think you can answer that as well as I.

Mr. Emery: Prof. Farrington lays considerable stress upon aerating the milk. Now, in a recent convention of cheesemakers, that question was up for discussion, and many of the experienced makers protested that aerating milk is not necessary, and I understand that some of the institute conductors in Wisconsin are proclaiming the same thing. I would like to know the grounds upon which Prof. Farrington bases his statement, and whether the sudden cooling of the milk to 50 degrees will not meet the case as well as aerating?

Prof. Farrington: I think that all of the objections that have ever been made to aeration were due to the air in which the milk is aerated. If you expose this milk to impure air, or where there is a bad odor, the aeration won't help it; but if you aerate the milk in pure air, you never can do it any harm, and it will certainly benefit its flavor to mix the milk with pure air.

Secy. Burchard: Some years ago I read that in the production of milk at the Morton farm, for consumption in New York City, they aerated the milk by forcing the air through it, pumping the air into it and mixing it with the milk in that way.

Prof. Humphrey: The air there is drawn down from above the peak of the barn and forced through a can of milk with a fan similar to a blacksmith's fan.

Mr. Emery: Is there any other benefit imparted to that milk by aerating it than simply cooling it?

Prof. Farrington: I think it sometimes replaces gases, some impure flavors, by pouring pure air into it.

Mr. Goodrich: Don't you remove some gases that are always in milk. You used to talk about a cowey odor; some of you scientific people said that the cowy odor was produced by dirt, but we know that clean, pure milk has got a peculiar odor that sometimes a little child objects to, and after those gases have been dissipated there is a different taste to the milk.

Mrs. Howie: Prof. Farrington, do you think a good healthy cow, properly cared for and groomed, and the best possible care taken of the milk, that it would be necessary to aerate that milk, provided it was plunged into ice water, stirred and cooled rapidly?

Prof. Farrington: I think not.

Mr. Moore: Mrs. Howie has described an ideal condition. As a rule, the people who do the milking on our farms are people who are tired out with the work of the day, and you can not expect those people to stand over a can of milk and use their labor and time to stir it, and that is one reason I advocate the use of the aerator. Of course, I want it surrounded by some safeguard so as to have pure air. I visited a creamery day before yesterday, and the butter maker told me that by getting his patrons to use aerators, he had had a decided improvement in the milk from those patrons.

Mr. Emery: But does that come from any qualities imparted in the air, or simply the quick cooling of the milk?

Prof. Moore: The air removes what we call the volatile odors or gas.

Mr. Everett: I believe that even under the conditions mentioned by Mrs. Howie, aeration will benefit the qual-

ity of the milk, and in substantiation of that belief I want to state that H. B. Gurler, who manufactures certified milk that sells for twelve cents a quart and is recommended by the physicians of Chicago for infants and invalids, has as perfect conditions perhaps as can be found in this country, yet that pure milk as it comes from his cows in the most cleanly manner and surroundings is run over an aerator.

Mrs. Howie: Referring to what Mr. Emery said about the milking coming among the extra chores of the men, I want to say that the washing and care of the aerator falls upon the woman as a usual thing. You will find a couple of those aerators up in my attic today. We use a long-handled spoon that costs fifteen cents, and I would prefer to stir the milk in one of those shotgun cans for fifteen minutes to washing one of those separators.

The Chairman: What kind of an aerator was it?

Mrs. Howie: It is a large aerator that the milk flows over the sides, and I found I lost about a pound of milk every time, sticking to the sides of it.

Mr. Moore: How much did it cost?

Mrs. Howie: Eight dollars, and you may have it for two, and it is in good condition.

Mr. Moore: I had an aerator made at the shop, a pail with an iron tripod with a thumbscrew, so it can be raised or lowered, with holes in the bottom, so the milk passes through in minute streams. That only cost 75 cents to a dollar and is no more trouble to wash than a common pail.

Mr. Wright: Would you professors recommend the use of an aerator where we had no milk house? My experience is, there is no use talking about aerators until you have a milk house. If you put one up in one of these big barns, you will hurt the milk more by the dirt and stuff you get into it than the aerator will get out.

Mr. Moore: We don't want you to use the aerator in the barn; put it out doors. One of the best farmers of the state of Minnesota, with a large farm and using a silo, describes his method of keeping his milk, and he never has sour milk or frozen milk and never had any milk rejected from the creamery in twelve years, and all he has is a large wooden tank outside,

near the well, inside of which is an iron tank, and it is packed with some insulating material and filled in with straw, and has a good, tight cover. It is fixed so that water can be kept a little above the middle of the cans with running water and he is never troubled with freezing. The whole thing wouldn't cost more than eight or ten dollars.

REPORTS OF COMMITTEES.

The reports of the following committees were received and adopted:

RESOLUTIONS.

Resolved, That this Association hereby express its deep sympathy for our treasurer, Mr. H. K. Loomis, on account of the serious illness of his wife which prevents him from being present at this meeting, thus depriving us of his valuable services, this being the first and only time he has been absent from our yearly meeting during the long period of years.

Resolved, That we express our approval of the effort that is being made to conduct an annual butter and cheese scoring contest or exhibit and that we urge the legislature to provide the necessary appropriation for meeting the expenses of this educational work.

Resolved, That the sincere thanks of this Association are due the citizens of the city of Wausau for the excellent manner in which they have entertained and cared for us, and for their evident appreciation of the object and aims of this Association. And we are also encouraged by the lively and intelligent interest taken in the subjects discussed in our meetings by many of the farmers and dairymen of Marathon county which gives us good grounds to believe that this splendid county at no distant day will, as it ought to, take a foremost rank as a dairy county in this great dairy state of Wisconsin; and we also resolve that we will never forget the splendid banquet that was served to us by the citizens of Wausau.

Resolved, That the Association regards with pronounced opposition the effort the oleomargarine manufacturers are making to lower the ten cent Federal tax on their product when colored in imitation of butter. Their argument that this tax is a hardship to the poor is false for the reason that on the uncolored product there is practically no tax. What they are really after is an opportunity to swindle the consumer by selling him colored packing house grease for the pure product of the cow. The present ten cent tax stands in their way of consumating this villany.

Resolved, That this Association calls upon the Wisconsin members of congress in both houses to do all in their power to prevent any such reduction believing as we do that the maintenance of the law is emphatically in the interest of the consumer as well as the producer of butter.

Resolved, That this Association desires to express its warm sympathy with President Roosevelt in his effort to have all transportation abuses done away, to the end that a "square deal" and even chances may be accorded to every shipper. As producers of butter and cheese finding market and consumption in distant portions of the country the dairymen of Wisconsin are vitally interested in this question.

Resolved, That this Association is heartily in favor of the movement now before the legislature of Wisconsin to establish a state railroad rate commission before which questions of overcharge and discrimination may be referred for correction and adjustment.

Resolved, That the Wisconsin Dairymen's Association assembled in the thirty-third annual session at the city of Wausau hereby records its judgment that under the legislation of the past, the expansion of the Wisconsin Dairy and Food Commission since its establishment in 1889, has not been commensurate with that of other departments of our state government, nor with that of like departments of neighboring states, nor has its expansion been commensurate with the vastness of the interests it was established to promote. We record our protest against a continuance of the restrictive or non-expansive policy of the past and we most urgently request the present legislature to provide a sufficiently liberal number of assistants and in-

spectors for the dairy and food commission, to furnish adequate instruction and inspection for the cheese factories, creameries and dairies of this great dairy state to the end that the quality of our dairy and other food products may be the equal of the best in other states.

EXHIBITS.

The committee on Exhibits and Dairy Machinery would respectfully report that the 16 entries of butter show by the average score of 93 that its quality is above the average for this season of the year; and the average score of 95 on the 5 entries of cheese is also an extremely high one.

The exhibits of dairy machinery included the following styles of hand separators: The De Laval, the Empire, the Sharples and the United States. A collection of churns, butter-workers, aerators, patent milk pails and other appliances used in the farm dairy was shown by the Creamery Package Manufacturing Co. of Chicago. Attention was drawn to the Wyandotte cleaning and washing powder, by a coop of Wyandotte chickens, which was surrounded by many small sacks of this powder.

The display of agricultural products included samples of potatoes, grains, other farm seeds and vegetables of the usual superior quality characteristic of these products grown in Marathon county.

An exhibit of ten samples of soil taken from as many different farms east and west of the city of Wausau—23 miles east and 36 miles to the west—by the students of Marathon County Agricultural School illustrated the excellent quality of the soil in this section. A very attractive display of honey, both in the comb and extracted, was exhibited by Mr. Robert Morgenstern.

E. H. Farrington.
T. Corneliusen.
R. B. Johns.

FINANCE.

We, the members of the Finance committee, having examined the bills and vouchers of secretary and treasurer of the Wisconsin State Dairymen's Association, find them correct to the best of our ability.

F. H. SCRIBNER,
W. ERBACH,
U. S. BAER,
Committee.

Wausau, Feb. 10, 1904.

The committee on nominations reported by Mr. Taylor, Chairman, as follows:

The committee on nominations desire to report at this time that we recommend the continuation of Mr. Hill as President for another year, and also that we continue Mr. Loomis as Treasurer for another year. Regarding the Secretary, your committee has considered the matter, taken quite large councel, and are desirious of reporting that in the opinion of the committee no recommendation be made at this meeting for a successor to Mr. Burchard, and that the matter of electing a Secretary to succeed Mr. Burchard be left with the executive committee with power to act.

Mr. Everett: I second the nominations made by the chairman of the committee, and also the recommendation as to the secretaryship.

The motion was put to the house by Mr. Everett and carried unanimously, and Mr. Charles L. Hill declared the duly elected President of the Association for the ensuing year; also Mr. H. K. Loomis declared the duly elected Treasurer for the ensuing year, and the election of the Secretary left to the Executive Board.

President Hill: I am sure I thank you again most heartily for the honor you have conferred upon me, and I consider it an honor indeed. I feel more than ever that I am unworthy of the place, but I will just do the best I can.

WISCONSIN DAIRY STOCK AT THE LOUISIANA PURCHASE EXPOSITION.

H. C. Taylor, Orfordville, Wis.

Mr. Taylor, Mr. Chairman, Ladies and Gentlemen: I want to be absolutely correct and fair and unprejudiced in every statement that I make in regard to this wonderful test at St. Louis, and to avoid any suspicion of incorrectness or unfairness, I am willing to acknowledge that I took my report from the Wisconsin Agriculturist, whose editor is my friend Everett—and I do that openly and above board, before you all. (Mr. Taylor thereupon took his manuscript from a copy of the paper mentioned.)

The dairy cow demonstration at St. Louis brought out representatives of four breeds of cows, viz.: Jerseys, Holsteins, Brown Swiss and Shorthorns, and proved an essential feature and attraction of this the greatest of all Worlds' Fairs.

PLANS OF OPERATION.

Most of you are conversant with the plan and scope of the test, which was non partisan in its management and conduct.

Four barns were built by the Exposition Company and each occupied by one of the breeds entered. Each association appointed a committee and superintendent of its own who selected the cows of each breed they represented. Each superintendent selected his own assistants to milk, feed and care for the cows under his supervision. Each superintendent was allowed to compound the rations for each cow of his breed without restriction. But all feed was weighed and charged to each cow daily. A list of feeds and the price of each was prepared by the official test committee and from this list each breed superintendent selected the feeds he desired.

The weights of these feeds, together with the milk produced daily, were carefully recorded by men employed by the Exposition and stationed in each barn during the entire day. Aside from these two recording or checking clerks was a Jefferson guard detailed to remain in each barn both day and night.

These Jefferson guards were under special instructions from the Exposition authorities.

The feeds were provided by the breed superintendent for his breed, at the expense of the breeders' association he represented. The feed was stored in rooms above the cows and was under lock and key, the keys being carried by the checking clerks. Once a day the feed was weighed out to each cow by the checking clerk and placed in a box marked with the number of the cow. The hay was weighed and placed in sealed sacks. The boxes and sacks were only opened and sealed by the checking clerks and then at feeding time. The herdsman for each breed was allowed to feed as much as he pleased, when the box was relocked and the sacks resealed.

TESTING OF MILK.

At milking time the milk from each cow was weighed and samples taken by the recording clerks. As each cow was milked three times a day, the three samples each day were placed in the same bottle and constituted a composite sample for the three milkings. It was so arranged that the morning's milking would end the day and complete the composite sample. These composite samples were then taken to the laboratory and by the official test committee tested for fat content and solids not fat.

The official test committee was composed of the late Major H. E. Alvord, Chief of the Dairy Division, Washington, D. C.; C. F. Curtis, Dean and Director of Agriculture, Ames, Iowa, and Prof. Farrington, Professor of Dairying of University of Wisconsin. As a result of earnest solicitation by all parties interested, Prof. Farrington took charge of the details and management of the test—a duty that he was well qualified to perform. His rules issued to govern the test were fair to all breeds and in accordance with advanced knowledge of dairying. Through his untiring efforts and thoroughness and unquestioned correctness a vast amount of very valuable data has been secured for the dairy fraternity and students of dairying. A valuable addition to scientific experiment station data of far-reaching value and importance was obtained. Never has been an opportunity afforded for securing such reliable and scientific records as this. The cows were selected by men who were

considered good judges of the breed they represented and endeavored to secure the best representative animals of the breed. Each breed was fed and handled by practical feeders and herdsmen who were acquainted with the breed character of the breed he handled. The ration for each cow was provided with reference to its component elements, digestibility, nutritive ratio, and palatability, and was fitted to each cow. The milk was tested by Experiment Station professors of known reputation. Thus these World's Fair records are to be relied upon as correct and impartial, and a study of them will no doubt stimulate many dairymen to do better.

METHODS OF FEEDING.

As the cows were milked and fed three times a day, I desire to give you the routine labor for one day. At 8 o'clock a. m. the locked boxes were taken to the feed room and the daily ration for each cow was weighed into her feed box which was locked and placed on the floor in front of the cow.

Three sacks of hay were weighed out for each cow and placed along side the box containing her grain ration. At noon a feed of silage was weighed out and placed in a box to which was added about one-third of her grain ration provided for her for that day. This was fed at noon, immediately after milking, which was begun at 11:30 and finished at 1:00 p. m. Then each cow was fed one of the three sacks of hay. After this she was watered. From 2:00 p. m. to 5:00 p. m. was a period of rest. At 5:00 p. m. another ration of silage was weighed into the feed box and another portion of feed from each cow's locked box was added to this and fed immediately after milking, which began at 6:00 p. m. Then they were given another sack of hay and watered and left for the night. In the morning the cows were milked and fed the ensilage and grain ration as previously indicated and watered at about 8:30 a. m.

There was quite a difference in the proportion of grain and roughage fed the cows in the different herds. Two herds were fed large quantities of green feed, such as green clover, green corn stalks, etc., with the grain, and the other herds were fed no green feed but larger amounts of grain and silage and hay.

Some idea of the amount and variety of feed consumed daily

by one cow in the different herds is shown by the following figures:

One day's ration of one cow in each herd.

Feed	Brown Swiss.	Holstein.	Jersey.	Shorthorn.
	Lbs.	Lbs.	Lbs.	Lbs
Alfalfa hay	7		18	9
Cut alfalfa hay		15	6	
Corn silage			16	24
Green cut corn	40	15		
Wheat bran		2	3	4
Green cow peas		35		
Linseed (oil meal)			2	2
Ground oats			2.5	2
Hominy feed	8	5	2.5	3
Gluten feed			5	2
Corn meal			15	
Cotton seed meal	1	1		3
Corn hearts			2.5	2
Distillers grains				4
Union grains	15	14		
Total	71	87	59	54
Grain	24	22	19	22
Coarse feed	47	65	40	32

Such records as these are probably a revelation to many a man who has fed and milked cows for years. It has not been customary to give more than five to ten pounds of grain per day to cows on the home farm, and the majority of them probably get less than five pounds. A capacity for assimilating large rations is necessary for producing large quantities of milk and butter, and most of the World's Fair cows were fed to their limit of endurance. A daily feeding per cow of near twenty pounds of grain, together with thirty to sixty pounds of green feed was not uncommon, although there were some variations in the amount during the 120 days of the test.

It will be noticed by these figures that two of the herds were fed only three or four kinds of grain per day, while the other two were given seven and eight kinds of grain per cow per day. Small quantities of a large number of different kinds of feed

seemed to be considered by some of the feeders as best adapted to the production of milk, while others fed larger amounts of a few kinds.

Record of the best, poorest and average cow in each herd.

Daily average.

	Brown Swiss.	Holstein.	Jersey.	Shorthorn.
Milk, lbs.				
Best cow, No. 1	51.0	67.5	48.4	43.4
Poorest cow, No. 2	38.5	47.1	38.8	21.4
Average cow	44.2	53.4	41.5	34.6
Test of milk.				
Best cow	3.4	3.5	4.8	4.0
Poorest cow	3.8	3.2	4.1	3.9
Average cow	3.62	3.43	4.7	3.8
Butter fat, lbs.				
Best cow	1.748	2.355	2.334	1.737
Poorest cow	1.477	1.507	1.615	0.843
Average cow	1.596	1.832	1.936	1.277
Butter, lbs.				
Best cow	2.042	2.753	2.750	2.037
Poorest cow	1.731	1.756	1.898	0.988
Average cow	1.870	2.12	2.28	1.495
Solids, not fat, lbs.				
Best cow	4.363	5,171	4.357	3.720
Poorest cow	3.585	3.614	3.441	1 902
Average cow	3.919	4.239	3.634	2.980
*Feed cost of milk per quart.**				
Best cow	$0.0109	$0.0090	$0.0110	$0.0109
Poorest cow	0.0139	0.0122	0.0130	0.0215
Average cow	0.0124	0.0107	0.0116	0.0132
Feed cost of butter per lb.				
Best cow	$.136	$.110	$.097	$.117
Poorest cow	.155	.164	.132	.234
Average cow	.147	.135	.105	.153
No. of cows in herd	5	15	25	28

*Assuming two pounds to the quart.

This page of tables is of value to the dairymen because it contains the records of four breeds and four herds of selected cows. Note carefully the large yields of milk and butter. Again observe the difference between the production of the best and poorest cows in each breed represented by these selected herds.

Another item of great interest to us all is set forth on this page and that is the feed cost of one quart of milk and the feed cost of one pound of butter from the best the poorest and average cow in each of these four breeds. The feed cost to produce one pound of butter with Brown Swiss was 14.7 cents, Holstein 13.5 cents, Jerseys 10.5 cents, Short Horns 15.3 cents. One gallon of Brown Swiss milk cost to produce, 4.96 cents, Holstein 4.28 cents, Jersey 4.64 cents, Short Horn 5.28 cents.

Milk and butter produced by each herd in the 120 days.

	Brown Swiss.	Holstein.	Jersey.	Shorthorn.
No. of cows	5	15	25	25
Milk, lbs.	26,508	96,169.9	124,524.2	In class B. 103,800.05
Average test	3.62	3.43	4.7	3.6
Butter fat, lbs	957.8	3298.4	5810.6	3835.0
Butter, lbs	1120.5	3817.0	6844.9	
Value of butter at 25c	$280.12	$954.26	$1711.25	
Solids not fat in milk, lbs	2351.7	7650.9	10902.4	8938.9
Cost of feed	$164.47	$515.72	$720.40	$664.00

Total feed consumed by each herd during the 120 days.

	Brown Swiss.	Holstein.	Jersey.	Shorthorn.
No of cows	5	15	25	*29
Feed.				
Alfalfa hay	2,091 8	11,386.4	44,971 1	32,997.0
Green clover	3,298.0	10,255.0		
Oats and peas	4,989.4	17,725.0		
Cut green corn	21,821.0	59,203.5		
Bran	525.0	1,811.9	7,851.5	11,588.5
Oil meal	275.6	541.0	5,384	4,737.0
Cottonseed meal	518.45	695.5	1,706	4,602.0
Malt sprouts	2,120.4			
Gluten feed	2,416.3	966 3	12,591.8	9,666.0
Hominy feed	4,544.7	3,207.7	1,928.5	7,583.5
Clover hay	2,001.7	96.0	1,271.0	6,206.0
Union grain	3,561.7	22,384 3		
Ground oats		99.5	2,917.5	8,211.0
Corn meal		789.2	9,454.7	967.0
Corn hearts		4,483.1	4 167.0	6,901.5
Cut alfalfa		8,432.0	18,202.9	
Cow peas		1,706.9		
Middlings	131.5			
Silage			36,782.5	51,587.0
Distillers grains			2,688.7	6,221.0
Rolled oats			202.0	

*One cow died at the end of the first period of sixty days.

This table gives us the total milk and butter production, with the total cost of feed consumed to produce the same. To summarize we find that $1.00 worth of feed consumed by the Brown Swiss returned $2.13 in product; Short Horn returned $2.12; the Holsteins returned $2.29; Jerseys $2.84.

Herd results in ten days periods (first period beginning June 16.) Figures represent the average per cow per day in each herd.

Periods.	Brown Swiss.			Holstein.			Jersey.			Shorthorn.		
	Milk.	Test.	Butter fat	Milk.	Test.	Butter fat.	Milk.	Test.	Butter fat	Milk.	Test.	Butter fat.
I	51.1	3.26	1.67	61.5	3.36	2.07	43.8	4.26	1.86	37.2	3.42	1.27
II	51.7	3.21	1.66	57.7	3.40	1.96	44.5	4.36	1.94	36.8	3.44	1.26
III	42.2	3.38	1.43	51.5	3.58	1 85	45.1	4.36	1.96	35.2	3.57	1.26
IV	44.5	3.56	1.62	47.1	3.57	1.68	43.5	4.53	1.97	30.1	3.59	1.08
V	45.8	3.59	1.37	55.3	3.39	1.88	43.9	4.48	1.97	35.4	3.61	1.27
VI	46.0	3.68	1.69	55.1	3.30	1.82	42.8	4.61	1.97	36.0	3.69	1.33
VII	40.9	3.80	1.55	52.7	3.52	1.85	41.7	4.68	1.95	35.2	3.78	1.33
VIII	46.3	3.82	1.77	53.5	3.39	1.81	41.1	4.71	1.93	34.0	3 80	1.29
IX	40.7	3.75	1.53	53.5	3.40	1.82	39.8	4.87	1.94	31.6	3.87	1.23
X	41.0	3 84	1 57	54.3	3.40	1.85	38.8	5.02	1.95	31.4	3.86	1.21
XI	36.4	3.81	1.39	47.7	3.48	1.69	35.7	5.21	1.86	28.7	3.95	1.13
XII	42.2	3.66	1.66	50.2	3.41	1.71	37.5	5.13	1.92	28.8	3.86	1.11

In these 12 periods of 10 days each there was a shrinking of the flow of milk towards the last, but a noticeable increase in the per cent of fat. The Brown Swiss gave practically the same quantity of fat the last period that they did the first. The Holsteins gave 2.07 pounds per day the first and 1.71 the last. The Jerseys gave 1.86 the first and 1.92 the last. The Short Horns gave 1.72 the first and 1.11 the last.

Please carefully note the wonderful uniformity of production of some of these herds and then think if you are keeping up the flow in your own herds.

Weight as related to product.

	Milk.	Test	Butter fat.	Butter.	Net profit.	Weight.	
	Lbs.						
Heaviest Holstein, 1,512.....	5,659	3.2	180.9	249 8	$18 03	1,319	Best.
Lighest Holstein, 1,225. .	5,671	3.5	200.2	280.2	25 11	1,512	Poor'st
Heaviest Jersey, 1,141	4,680	5.	234.2	276.1	37 99	1,075	Best.
Lightest Jersey, 809	4,497	4.77	214.8	253.1	36 41	1,089	Poor'st
Heaviest Brown Swiss, 1,501	5,924	3.4	20.15	235.3	23 27	1,285	Best.
Lightest Brown Swiss, 1,214.	4,403	3.9	171.4	200.9	21 27	1,214	Poor'st
Heaviest Shorthorn, 1,512 ...	4,053	4.3	172.3	202.5	21 82	1,169	Best
Lightest Shorthorn, 1,060 ...	4,584	3.2	145 0	168.9	17 19	1,446	Poor'st

The heaviest cow in this test weighed 1,512 lbs., the lightest 809 lbs. Here are two cows, one of which weighs approximately twice as much as the other. You that are looking for a big cow that is grand to look upon, listen to me while I report that the heaviest cow made a net profit of $18.03 in 120 days and the small cow made $36.41. Here is a case where two cows must be kept to do the work of one. I refer to this at this time to show to you that it is not the size in a cow that enables her to make a profit. Very many cow owners of Wisconsin are fooled by this notion and will not see it in any other way.

Relative standing of individuals in class A.

For the economic production of butter fat and butter.

Entries: 25 Jerseys; 15 Holsteins; 5 Brown Swiss.

Official cow No.	Breed.	Value of products.	Cost of feed.	Net profit.
37	Jersey	$82.507	$31.989	$50.518
39	Jersey	78.139	30.270	47.869
45	Jersey	77.618	30.630	46.988
25	Jersey	75.128	29.048	46.080
20	Holstein	82.590	36.573	46.017
26	Jersey	74.828	29.804	4\.019
40	Jersey	73.392	29.167	44.225
21	Jersey	73.841	30.056	43.785
30	Jersey	72.601	29.251	43.350
38	Jersey	72.576	29.339	43.237
43	Jersey	71.674	29.595	42.079
35	Jersey	70.760	28.746	42.014
31	Jersey	70.260	28.471	41.789
22	Jersey	68.806	28.937	39.869
23	Jersey	69.688	29.601	39.787
13	Holstein	74.536	35.232	39.304
42	Jersey	64.184	26.057	38.127
44	Jersey	69.044	31.045	37.999
12	Holstein	71.874	24.165	37.709
33	Jersey	64.209	26.581	73 628
29	Jersey	63.287	26.879	36.408
32	Jersey	61.844	27.384	34.460
15	Holstein	70.028	35.619	34.409
28	Jersey	61.433	27.678	33.755
34	Jersey	61.236	27.739	33.497
27	Jersey	59.136	26.691	32.445
18	Holstein	66.427	34.464	31.963
41	Jersey	59.895	29.334	30.561
8	Holstein	64.667	34.516	30.151
17	Holstein	64.953	34.817	30.136
24	Jersey	57.372	27.689	29.683
6	Holstein	62.469	32.798	29.671
1	Brown Swiss	61.261	33.489	27.772
19	Holstein	61.256	33.956	27.300
36	Jersey	56.950	30.226	26.724
16	Holstein	58.532	33.416	25.116
14	Holstein	57.604	33.571	24.133
4	Brown Swiss	57.823	34.242	23.581
10	Holstein	57.838	34.539	23.299
5	Brown Swiss	58.845	35.574	13 271
9	Holstein	54.861	32.662	22.199
2	Brown Swiss	50.240	28.961	21.279
3	Brown Swiss	51.958	30.265	19,572
11	Holstein	53.911	34.700	19.211
7	Holstein	52.706	34.675	18.031

Relative standing of individuals in class B.

For the economic production of milk for all purposes relative to dairying.

Entries: 25 Jerseys; 25 Shorthorns; 15 Holsteins; 5 Brown Swiss.

Official cow No.	Breed.	Value of products.	Cost of feed.	Net profits.
37	Jersey	$99.735	$31.989	$67.746
20	Holstein	103.396	36.578	66.823
39	Jersey	93.166	30.270	62.896
45	Jersey	93.394	30.630	62.764
26	Jersey	91.402	29.804	61.598
25	Jersey	90.641	29.048	61.593
40	Jersey	87.735	29,167	58.538
21	Jersey	88.551	30 056	58.495
38	Jersey	87.686	29.339	58.347
30	Jersey	87.195	29.251	57.944
43	Jersey	86.624	29.595	57.029
13	Holstein	92.249	35.232	57.017
35	Jersey	85.414	28.746	56.668
31	Jersey	84.666	28.471	56.195
22	Jersey	84.327	28.937	55.390
12	Holstein	88.688	34.165	54.523
23	Jersey	83.857	29.901	53.956
15	Holstein	88.873	35.619	53.254
44	Jersey	82.864	31.045	51.819
42	Jersey	77.864	26.057	51.807
33	Jersey	76.660	26.581	50.079
29	Jersey	76.190	26.879	49.311
32	Jersey	76.666	27.384	49.282
18	Holstein	83.353	24 464	48.889
8	Holstein	82.859	34.516	48.343
34	Jersey	75.305	27.789	47.506
63	Shorthorn	75.923	28.574	47.349
17	Holstein	82.165	34.817	47.348
11	Holstein	81.218	34.700	46.518
28	Jersey	73.267	27.678	45.589
6	Holstein	78.377	32.798	45 579
1	Brown Swiss	78.648	33.489	45.159
41	Jersey	74.142	29.324	44.808
27	Jersey	70.734	26.691	44.043
24	Jersey	71.641	27 689	43.952
19	Holstein	77.162	33.956	43.206
66	Shorthorn	66.323	24.530	41.793
10	Holstein	75.391	34.539	40.852
5	Brown Swiss	76 352	35.574	40.778
36	Jersey	70.551	30.226	40.325
14	Holstein	73.708	33.571	40.137
16	Holstein	73.338	33.416	39.922
4	Brown Swiss	73.755	34.342	39.513
51	Shorthorn	71.394	33.211	38.183
9	Holstein	70.381	32.662	37.719
65	Shorthorn	61.441	24.004	37 437
68	Shorthorn	62.244	25 444	36.800
74	Shorthorn	60.349	25.473	34.876
2	Brown Swiss	63.032	28.961	34.071
3	Brown Swiss	66.105	32.255	33.900
52	Shorthorn	62.289	28.819	33.470
7	Holstein	67.302	24.675	32 627
72	Shorthorn	57.818	25.254	32.564
46	Shorthorn	61.463	29.756	31.707
56	Shorthorn	58.179	26.911	31.268
60	Shorthorn	58.036	26.953	31.083
73	Shorthorn	57.005	26.256	30.749
47	Shorthorn	58.293	27.816	30.470
54	Shorthorn	55.225	25.048	30.177
46	Shorthorn	60.468	30.883	29.588
69	Shorthorn	56.203	27.008	29.195
58	Shorthorn	56.627	27.699	28.928
57	Shorthorn	55.993	28 770	27.223
59	Shorthorn	53.581	27.802	25.779
71	Shorthorn	54.004	28.638	25.366
64	Shorthorn	50 813	26.598	24.215
50	Shorthorn	53.876	30.086	23.790
53	Shorthorn	47.608	24.509	23 098
70	Shorthorn	44.633	22.792	21.841
48	Died Aug. 14	18.920	11.229	7.691

Herd averages in Class B.

	Jersey.	Holstein.	Brown Swiss.	Shorthorn.
Average milk per cow, lbs.	4981.0	6411.3	5301.6	4152.0
Average lbs. milk per cow per day	41.5	53.4	44.2	34.6
Average per cent. of fat	4.7	3.4	3.6	3.6
Average lbs. fat per cow	232.43	219.89	191.56	153.41
Daily average lbs. fat per cow	1.936	1.832	1.596	1.279
Average per cent. solids not fat	8.8	7.9	8.9	8.6
Average lbs. solids not fat per cow	436.096	508.727	470.340	357.556
Daily average lbs. solids not fat per cow	3.634	4.239	3.919	2.979
Value fat, per cow	$69.73	$65.97	$57.47	$46.02
Value of daily lbs. fat per cow	.58	.55	.48	.38
Value of solids not fat per cow	13.08	15.26	14.11	10 72
Value of daily solids not fat per cow	.109	.127	.117	.089
Value of total products per cow	82.81	81.23	71.58	56.74
Value of daily total products per cow	.689	.677	.597	.469
Average cost of feed per cow	28.90	34.38	32.89	26.56
Average daily cost of feed per cow	.240	.286	.274	.221
Average net profit per cow	53.91	46.85	38.69	30 18
Average daily net profit per cow	0.45	.39	.32¼	.25

This test should settle these dairy points:

1st. Dairy breeds for dairy work.

2d. There are profitable cows in all breeds.

3d. Selection of cows is of prime importance.

4th. Kinds of feed and regularity in feeding and milking are necessary.

5th. That a very high yield can be obtained and maintained for a long period.

6th. That richness cannot be fed into milk.

7th. That there is no art nor science nor cow that can at the same time with the same feed make butter-fat and flesh profitably in both directions.

TEST BROUGHT OUT NEW TREATMENT FOR MILK FEVER.

A discovery of very great value to the dairy world was brought out and demonstrated early in the preliminary work for this test. I refer to the application of oxygen for milk fever. In the Jersey barn 41 cows freshened and 11 were stricken with milk fever and all successfully treated. A number of cases was reported in the other barns and all successfully treated.

This treatment consists in inflating the udder of the sick cow with oxygen, and was first brought to the attention of the dairymen by being used in the Jersey barn at St. Louis. The results of its use there were widely published and dairymen everywhere have tried it with success. This St. Louis test was the occasion that applied and demonstrated the value of this cure and this alone is of far greater value to the dairymen than the total cost of the dairy cow demonstration.

Among the valuable lessons taught by these exhaustive records is the great superiority in economical production of milk and butter by some cows over others which may require nearly the same feed and care. Many people fail to realize what a wonderful animal a cow is.

It is certainly amazing, if a person stops to think of it, that a cow of average capacity secretes in her milk one hundred and thirty-six million fat globules per second, and that a cow giving 8,000 pounds of milk in 120 days, as did one of those at St. Louis, is manufacturing milk at the rate of nearly one and one-half quarts per hour, day and night.

Few investments are accumulating interest at the rate of eight cents an hour as was the case with this cow if her milk is worth 5 cents per quart.

Another feat accomplished by this cow was the production of 903 lbs. of milk solids in 120 days, or about seven and a half pounds of solids, digestible food, every twenty-four hours. Is not that a wonderful performance and does not it increase your respect for a cow?

The cost of feed for this cow was $36.57, and if the 8,000 lbs. of milk from it is worth five cents a quart its value is $200. And this was produced in four months. The feed cost for this

cow was $9.00 per month, making a net profit of $41.00 per month.

During the 120 days she gave over eight gallons of milk a day, and this contained two and three-fourths pounds of butter per day, which was a great record when it is remembered that she kept it up for so long a time. The feed cost of this butter was eleven cents a pound and her milk less than four cents a gallon.

Another wonderful cow gave during the 120 days 5,800 pounds of milk that contained within one-third of a pound as much butter as the first cow mentioned. The feed cost of a pound of butter from this cow was nine and four-tenths cents. Now this cow made the same amount of butter but it cost $4 less in feed to make it. She added 77 lbs. to her weight while the other added 54.

The cows in this test came from many states. There was at the St. Louis Fair at one time 41 Jerseys that represented 30 breeders and 17 states. The final selection of 25 Jerseys represented 16 states and 19 breeders. Three Jerseys might be counted as Wisconsin cows. The winning cow was bred by Moore & Gilbert of Muncee, Ind., and was purchased by F. H. Scribner who developed her. She was sold to the writer who owned her at the time the test began, when she was passed to the ownership of W. S. Ladd Est., Portland, Oregon.

The next cow in the test was Diploma's Brown Lassie, bred by Richardson Bros., Davenport, Iowa. She was developed at the Brown Bessie Farm and owned there during the test. She was second best Jersey cow. Wisconsin took a keen interest in this great test and her entries won out with the highest honors.

Only one Jersey bull was shown from Wisconsin, Merry Maiden's Third Son. He won first prize, champion and grand champion. He is herd bull in the Brown Bessie Herd. Of the Holstein breed three cows entered the test from Wisconsin, none of which was near the front. In the show ring Sarcastic Lad won first prize, champion and grand champion prize. This bull was the head of Mr. Gillett's herd for six years.

Wisconsin sent several herds of Guernseys to compete in

show ring, and won many prizes; none, however, was entered in test. Wisconsin Guernseys won many first prizes. First prize aged Guernsey bull was shown by a New York breeder but was bred in Wisconsin. The second prize aged bull was bred and owned by a Wisconsin breeder. Mr. Hill, of Rosendale, bred both of these. Mr. Hill also won first prize and junior champion on yearling bull, as well as first prize for bull calf. No females from Wisconsin were near the front.

Six Wisconsin Short Horn cows were entered in the test, which was one-fourth of the whole number. None of these came near the front.

Mr. Taylor (continuing): Arrangements have been made by which each one of these Jersey cows will have her picture in Hoard's Dairyman. The first prize cow appeared this week; the second prize cow next week, and so on in regular succession until the twenty-five have been shown. On the same page will appear a statement as to the breeding of the cow and a summary of her work while she was down there at St. Louis. So, if you can't wait for the report of this Dairymen's meeting, subscribe for Hoard's Dairyman, and you will get these things.

THE MARATHON COUNTY SCHOOL OF AGRICULTURE AND DOMESTIC ECONOMY.

Prof. R. B. Johns.

In the history of educational work in agriculture, this school occupies a unique place. It is the first of its kind to be opened in America.

The history of the struggles of institutions for the training of young farmers is interesting both in this country and in other countries.

The agricultural college system of the United States dates back to 1862, when the passage through congress of the Morrill Land Grants made the colleges possible. Michigan was the first state to take advantage of this act and establish a college

of agriculture meeting the requirements of the Land Grand Acts. This it did by connecting the new school with one established in 1847. Other states soon followed until at this time there are sixty-four Land Grant Colleges of Agriculture in the United States.

Many schools of agriculture, organized in different ways, had been established before the Morrill Act, the majority of which experienced a precarious existence for a time and then died. Far-sighted and broad-minded statesmen had foreseen the necessity for some method of training the farmer for his work, but it seemed that the difficulties in the pathway of the teacher of agriculture were insurmountable.

The Morrill Grants placed the agricultural college system upon a safe and secure basis, and the benefits derived from the colleges and experiment stations by the great agricultural population of our country are incalculable.

After all this was accomplished and the establishment of the United States Department of Agriculture at Washington, with the added aid of the Farmers' Institutes held in nearly all of the states, it was found that only a very small portion of the fify-one millions of our people, engaged in some form of agriculture, was reached in a contact so close as to be of the greatest practical benefit to them.

The movement leading to the establishment of County Schools of Agriculture and Domestic Economy in Wisconsin grew out of investigations made by the Hon. L. D. Harvey while acting as the state superintendent of public instruction during the year 1899. In his administration of this office the superintendent made a very thorough examination of the quantity and quality of school training received by the children of the rural population in the state. These investigations showed that the children of the agricultural population were not receiving a fair share of the benefits of a public school system of education, for their preparation in life's work, as compared with other vocations.

The superintendent was now made a commissioner to examine the conditions in other states and in foreign countries, and was required to report to the legislature of 1901 the needs of the rural schools of Wisconsin.

Upon the recommendation of the commissioner two county schools of agriculture were authorized by the legislature of

1901. Marathon county secured one and preparations were immediately made for erecting a building suitable for such a school. A site was selected on the west side of the city of Wausau, containing about seven acres of land, and upon this tract a building was erected at a cost of $16,500. The two lower floors of this building are devoted to the use of the agricultural school and the third floor to the Teachers' Training School.

The school was opened October 6, 1902, and offers the following courses which were approved by the state superintendent and the dean of the College of Agriculture:

COURSE OF STUDY FOR BOYS.

First Year.

First Term—The Soil, d. 5; Manual Training, Carpentry, d. 5; English, 5; Business Arithmetic, 5.

Second Term—Soils and Fertilizers, d. 5; Manual Training, Carpentry, d. 5; English, 5; Literary Reading, 5.

Third Term—Plant Life, d. 5; Vegetable, Flower and Fruit Gardening, d. 5; Poultry, d. 3; English, 5; Library Reading, 2.

Second Year.

First Term—Plant Life, d. 5; Manual Training, Blacksmithing, d. 5; U. S. History, 5; Economics, d. 3; Library Reading, 5.

Second Term—Animal Husbandry, d. 5; Rural Architecture, d. 5; U. S. History and Civl Government, 5; Library Reading, 5.

Third Term—Animal Husbandry, d. 5; Vegetable, Flower and Fruit Gardening, 5; Economics of Agriculture, 5; Library Reading, 5.

The numerals denote the number of recitations per week; d. denotes double period.

COURSE OF STUDY FOR GIRLS.

First Year.

First Term—Cooking and Sewing, d. 5; Domestic Hygiene, 5; English, 5; Business Arithmetic, 5.

Second Term—Cooking and Sewing, d. 5; Home Economy, 5; English, 5; Library Reading, 5.

Third Term—Cooking and Sewing, d. 5; Vegetable, Flower and Fruit Gardening, d. 5; English, 5; Library Reading, 5.

Second Year.

First Term—Cooking and Sewing, d. 5; Laundry, 4. 3; U. S. History, 5; Library Reading, 5.

Second Term—Cooking and Sewing, d. 5; Chemistry of Foods, 5; U. S. History and Civil Government, 5; Library Reading, 5.

Third Term—Cooking and Millinery, d. 3; Home Nursing, d. 2; Poultry, d. 3; Vegetable, Flower and Fruit Gardening, d. 5; Library Reading, 5.

The numerals denote the number of recitation periods per week; d. signifies double periods.

The complete course covers a period of two years of eight months each.

Under the law as amended by the legislature of 1903, the school receives state aid to the extent of two-thirds of the cost of maintenance, provided that four thousand dollars be the limit paid out of the state treasury to the school in any one year.

The equipment in the way of furniture, library, laboratory apparatus, kitchen utensils, sewing machines, tools and machines for carpentry shop and blacksmith shop have cost about six thousand dollars.

It may not be apart from the purpose of this paper to state briefly the plan and scope of the work attempted, also the place this kind of school is destined to fill in the school system of our state.

Taking up first the character of work done by the young women who attend the school—it is not the purpose or policy of the teacher in the department of domestic economy to turn out a class of girls prepared for the position of hotel cook or sewing girl. Qualifications for these places may come incidentally; but something broader, in increased power to think out the correct solutions of the perplexing problems of the manager of a home, is the result desired of the school's work. Girls who can calculate the cost of a dinner and who can select the

things composing it with an intelligent appreciation of their food values are better qualified to provide for the table of the home than those not so accomplished. Young women who know something of the correct sanitary arrangements of a home make much safer guardians of the health of the family than do those who are ignorant of these things.

The efforts of the school in this department are directed towards making intelligent and contented home makers who are not afraid of the responsibilities involved in cooking a dinner, discussing a poem, patching a torn garment, or entertaining the governor if need be. This kind of girl will adapt herself to any condition in life and will be a useful member of any community.

Under the teacher in this department all students are on the same footing—none are too good to wash dishes and the dignity of honest work is learned.

To the young men who enter the school two lines of shop work are offered, viz., blacksmithing and carpentry. In this work the boys obtain much of practical value in knowledge of how to make articles in every day use at the home. The disciplinary value of this work is not its least advantage. Habits of accuracy, patience and persevering industry are formed, which even in the short period of one term's work become very noticeable.

In the subjects included under agriculture the aim is to teach the elementary principles and successful practices of modern farming. No attempt is made to do original investigation work, the students being too immature for such work and the Experiment Station being organized for just that work. Only those things which have a bearing on local conditions are treated in detail.

In regard to the future of the county agricultural school and the place it will take in our school system, it seems to the writer that it is the only practical solution of the great problem of how to give professional training to the young who are entering upon this greatest of all American industrial pursuits as their life's work.

Doleful and dismal predictions have been made in regard to the county schools of agriculture. Some have said that they would be too small, that no school spirit could be developed, that

no equipment could be secured by a county school board that would be of much value.

All these fears prove to be phantoms, at close range.

Others have advocated the introduction of agricultural courses into our present system of high schools. Trials of this plan would appear to prove it unsatisfactory as the agricultural work usually amounts to nothing more than a study of the former work with a superficial agricultural bias tacked on.

In a state containing 175,000 farms it is hopelessly impossible to expect but a very small proportion of our young farmers to attend the college of agriculture, much as they would be benefited by so doing. In view of these facts, it would appear that the establishment of schools similar to our own at Wausau and its twin at Menomonie, is the only method in which the great rank and file of our young farmers may secure the training in the underlying principles of their business which will insure success in this age of close, even cruel, competition.

DISCUSSION.

Ex-Gov. Hoard: Do you think that the seven acres that you have allowed there can be so arranged as to furnish sufficient ground to carry out demonstration work, what you want to teach in the botany of the farm, and wouldn't it be an advantage to have some facilities for studying animal husbandry?

Prof. Johns: I believe that the law requires that not less than three acres shall be attached to schools of this kind. For garden work, horticultural work, that probably would be sufficient, but of course for farm crops the farm would be a very limited one. Now, as to the other question, we have here in Marathon county for teaching stock work better facilities, I may say, than almost any other county in the state. We have representatives of eight different breeds of cattle here and a number of fine flocks of pure bred sheep and swine, and we take our boys from the school in the afternoon and ride out to those farms. We take the whole class out to the farm, and there view the animals and go over the points as they stand before the class, and that gives us an opportunity also to see some of

the best equipped barns in the state, and the boys study the arrangements of these farms, buildings, etc. Some of these men have spent a great deal of money in their equipment and in the selection of their herds, and we probably can do pretty nearly as good work by going out on these farms.

Ex-Gov. Hoard: This is a very practical way of getting at it. Almost every county in the state has some cattle farms and many of them have them connected with the poor house and asylums. Could it not be possible that in some way, not having the school too close, that the county could utilize those farms for the instruction of such a school, the carrying on and conducting of the county farm?

Prof. Johns: I think that that is done at Menomonie. I think that the school over there has the use of the Fair Grounds, so that they have practically a farm in connection with their schools. We have the asylum farm and the poor farm within two miles of the city, and also the Fair Grounds within a quarter of a mile.

Ex-Gov. Hoard: These boys stand in the same position that I stood as a boy. It would have been a great advantage to me if I could have been taken and shown by the object and the eye some of these things, for instance, the difference in the characteristics of animals, why the Ayrshire is as she is, the Jersey as she is, the the Short Horn as she is, and I could also have been shown something in regard to stable management, all these things that come up now, but when I was a boy were almost unknown. The boy stands today on the shoulders of the generation that is ahead of him. What we learn when we are boys stays with us. What we learn when we are men maybe stays with us and maybe it doesn't, but it seems to me it would be a great advantage if in every county in this state there could be this organization of the farm judgment and the farm intellect and the farm conscience and the farm heart of its people, for the promotion of this desirable knowledge among the farm children, and I am glad to record here my gratefulness to Marathon county. I feel grateful to Marathon county that she has moved out onto this field, taken possession of it and has shown to the rest of us in the state what can be done and what we may hope to do for ourselves.

Mr. Quaw: The greatest advantage of schools of this kind is in looking over the boys and remembering that not one per cent of them will go into the Agricultural College. Here the boy can go to the Agricultural School because it is near home, at a nominal expense, and they can get a good deal that they never can hope to get by going to the Agricultural College.

POSSIBILITIES OF THE CHEESE INDUSTRY IN WISCONSIN.

E. L. Aderhold, Neenah.

The possibilities of the cheese industry of Wisconsin are hinged on 1. The increase in the demand for cheese. 2. Wisconsin's advantages in producing and distributing cheese. 3. The reputation of Wisconsin cheese.

DEMAND.

The demand for cheese, home and foreign, is probably somewhat in excess of 300,000,000 pounds a year.

It is believed that the per capita consumption at home does not exceed an ounce a week, or three and one-fourth pounds per year. On that basis a population of 80,000,000 people would consume 260,000,000 pounds annually.

From these figures it is apparent that this country has a large number of cheese "nibblers" but comparatively few cheese eaters.

The demand should grow from two causes. 1. Increase in the population and, 2, increase in the per capita consumption.

Prof. R. A. Pearson, while connected with the Department of Agriculture at Washington, stated at a cheesemakers' convention that the per capita consumption could and should be doubled, but made no estimate as to the time required for doing it.

I would not attempt to estimate what the rate of increase will be but will say it will depend largely on the character of the goods we place before the consumers.

Applying the per capita consumption given above to the average increase in the population of this country gives an increase in the consumption of between 4,000,000 and 5,000,000 pounds per year, or nearly half a million dollars worth. While the home demand, in recent years, has been rather lively and is showing a healthy growth it appears as though it should grow faster when we consider how small the per capita consumption is. However, there can be no question but that, for many years to come, there will be a steady growth in the demand.

PRODUCTION AND DISTRIBUTION.

From whence will come the supply for this increase in the demand? Aside from Wisconsin the states having the greatest pretentions as cheese producers are New York and Ohio. Next come Pennsylvania, Michigan, Minnesota and Iowa.

In the three last named states there is a strong leaning towards buttermaking. In the east also an appreciable proportion of the milk supply is, and will be, manufactured into butter and the demands on the milk supply by the big city population and by the condensing factories are so enormous as to actually divert milk away from cheese factories. So, in all the above named states the cheese industry is really not growing.

As to Wisconsin I will say that the leaning is equally strong towards the cheese industry as it is towards the butter industry; that our accessibility to the southern and western markets is equal to that of any state in the "cheese belt;" that we have a fertile soil where good water is plentiful; that we have sufficient rainfall and a scarcity of droughts; that we have a temperate climate with cool nights; that we grow abundant crops of red top, blue grass, corn, clovers and cheesemakers.

With this ideal combination of conditions it appears as though Wisconsin can, and should, take care of the lion's share of the increase in the trade because this can be done without encroaching on any other established industry, for, as the north half of the state develops there will be found room for several thousand cheese factories.

REPUTATION OF WISCONSIN CHEESE.

In conclusion I will state that when our milk producers will have provided their cows with stables that are healthful and sanitary; when they have been persuaded to *practice* cleanliness in milking; when factory operators who accept dirty milk will be rare instead of in the majority; when we can step into our factories and find, as a rule, vats full of milk that is normal and can be made into clean flavored cheese; when the consuming public is assured that Wisconsin cheese is made from clean milk and in clean factories, then, I venture to predict, the demand for our cheese will grow as rapidly as we can supply it and our most ardent hopes regarding the "Possibilities of the Cheese Industry of Wisconsin" will be realized.

DISCUSSION.

The Chairman: Some of us got the habit of thinking years ago that Sheboygan county must produce the cheese of this state, or Richland county should produce it, but the fact is Northern Wisconsin is coming into the fieid largely.

Ex-Gov. Hoard: From your experience, does the cheese improve in quality the further north you go in the state?

Mr. Aderhold: No, I really can't say that. The milk is a little richer up here than it is further south, as a rule, but it depends more upon how clean the milk has been and how it has been handled than anything else.

Ex-Gov. Hoard: But supposing the milk is equal in cleanliness and handled equally skillfully, do you think there is any advantage in the cooler summer?

Mr. Aderhold: Yes, there is, in the cooler nights. We can keep our temperature in the curing room better than if the nights were warmer. Of course, there is another advantage up here because of the clover growing so persistently, and the tame grasses, which they have not further south, and up here we are not troubled with droughts as they are further south.

Mr. Everett: Is the water any better up here?

Mr. Aderhold: It is better than in many places. I notice the land is usually sloping and there is no stagnant water to be found in this country. In some places there are ponds. I should consider it an ideal cheese country up here, because of the grasses and the country being well watered and the nights cool. There is no earthly reason why you can't make the finest kind of cheese if you will only learn to practice cleanliness.

Ex-Gov. Hoard: Is it more important to have clean, sweet milk in cheese making than it is in butter making?

Mr. Aderhold: I think the imperfections in milk will cause more trouble in cheesemaking than in buttermakng, but it is very important in both cases to have clean milk. Now, I believe for more reasons than one that the cheese industry is always going to be a good one as compared with other industries. Some of our farmers thought last summer that the cheese industry was running down, because for a few months the prices were a little low, the demand was a little dull. But there were a number of circumstances that combined to cause that. In the first place, there was a little change in the times last year in February, and the demand fell a good deal short of what it was expected to be. Then the presidential campaign was on, you know, and that always has something to do with upsetting business a little. Another condition was that for the first four months last year, we had more milk than we ever had for the same number of months in years previously, and we made more cheese. And there is one more circumstance that helped to depress the business and that was that a great many of the dealers had stocked up on very highpriced cheese the year before and "got it in the neck" and they wanted to get some of that money back,—and they did, too. But when the market became cleaned up, along in August and September, prices went up the same as they had been and they have been up ever since. They are now in the neighborhood of 12 cents, which is certainly very high. Now, we must not, because we have it a little dull for a few months now and then, come to the conclusion that it is always going to be that way. We have the same thing with other products that we produce, and if we are going

to quit raising pork or oats or mutton or beef or corn, because once in a while the market happens to be dull, there wouldn't be anything left for us to raise. I believe that the outlook for cheese is a little better with us than for any of the common products of the farm, because, in the first place, in those states outside of the cheese belt, it is not likely there is going to be very much cheese produced in the future, and, as I stated, there are only two or three states inside the cheese belt that are likely to be big cheese producers, and with the population growing all the time and the demand for cheese growing with it, it seems to me that the cheese business always will be very profitable for a great many years to come.

Mr. Emery: You did not mention the competition of Canada.

Mr. Aderhold: Well, there is a duty on Canadian cheese.

Mr. Moore: Is it not a fact that New York state is liable to go back in the manufacture of cheese on account of the enormous amount of milk consumed?

Mr. Aderhold: Yes, the city of New York demands so much milk that they are encroaching on the cheese industry. There is another consideration in connection with this question whether the cheese business will be profitable, and that is this, the production of milk is not increasing a fast as the population, and of course the population makes the demand for dairy products. For that reason, I think not only cheese, but all dairy products, will be profitable to engage in.

Ex-Gov. Hoard: There is another thing about the cheese-producing sections in New York state; the land there is not producing more than about half the feed it did forty years ago, and that is reducing the product of cheese per acre.

Secy. Burchard: And there is another proposition in connection with this matter, and that is the relative price of cheese in Wisconsin as compared with some other markets, New York and Canada, if you please.

Mr. Aderhold: I think the markets here average higher than they do in those places, though I have not kept close track of those figures. Of course, I read the reports from week to week and I believe that our cheese prices on the average are higher than they are in New York and Canada. I suppose one

reason for it is that we have better methods of selling our cheese, what they call the auction board. That has something to do with it.

Ex-Gov. Hoard: Then we have a great home demand.

Mr. Aderhold: We are closer to the southern and western markets than some of the other states are.

Ex-Gov. Hoard: They have to pay six cents a pound to get to our market.

Secy. Burchard: And there is one other item, that is, for the present or the recent past, we have saved to the farmers the toll that one set of middlemen take, haven't we, by not shipping to New York?

Mr. Aderhold: Yes, that is true. Of course, by having a home market for practically all our cheese, it cuts out one commission.

Mr. Emery: Is it true that the quality of Wisconsin cheese is such as to displace largely the New York cheese in the southern market?

Mr. Aderhold: Possibly so, but it is not because they could not make cheese to suit the southern market.

Ex-Gov. Hoard: The railroad freights are what have been playing hob with us in that particular. New York could put cheese in that country for a quarter of a cent less than we do.

Mr. Emery: Nevertheless our cheese supplies a large part of that market.

President Hill: The hour has come to close the convention, and I want to say just a word. I am sure we have appreciated the opportunity of being with you, and I think as the years go by, you will appreciate more and more that it has been profitable for the convention to come here.

You have listened to words spoken by these well known dairymen, men who have been successful in the business and I think you will feel as I do, that I owe a debt of gratitude to them for any success that may ever come to me, and I want you to realize that they do this unselfishly, that while in the same lines of business, if a man is successful, he often wishes to keep to himself the knowledge of the elements of his success, but these dairymen are certainly not like that. They have come here with dairy knowledge and we have been very kindly

received by you. We shall take away with us very pleasant remembrances of our visit at this time.

If there are no other matters of business, this convention will stand adjourned. Again, we thank you.

Mr. Loomis being unable to attend the convention forwarded his annual report as treasurer, to the secretary later and it is hereto appended.

TREASURER'S REPORT, 1904.

Mr. President and Members of the Association: The following itemized report is made showing the source from which all monies paid into the Treasurer's hands were received and the disbursements paid on orders from the Secretary, which I hold as vouchers.

Receipts.

1904.			
Feb. 19.	Balance in hands of treasurer.....	$494 56	
	Memberships for 1904	238 00	
May 14.	Received from state treasurer	2,000 00	
Nov. 22.	Received from state treasurer	2,000 00	
			$4,732 56

Disbursements.

1904.			
Feb. 23.	H. K. Loomis, moneys advanced, expenses, Platteville convention	$248 45	
24.	Premiums awarded at Platteville....	196 40	
26.	C. H. Everett, expense attending Platteville convention	8 45	
	C. P. Goodrich, expense attending Platteville convention	6 15	
	U. S. Baer, expense attending Platteville convention	3 60	
	J. Q. Emery, expense attending Platteville convention	3 85	
	J. R. Danks, expense attending Platteville convention	3 60	
	Chas. L. Hill, expense attending Platteville convention	8 15	
Apr. 6.	W. A. Henry, expense attending Platteville convention	4 60	
	H. L. Russell, expense attending Platteville convention	3 75	
	J. G. Moore, expense attending Platteville convention	3 85	
	E. L. Aderhold, instructor, Platteville convention	64 50	
20.	Mrs. A. L. Kelly, report	111 54	

May	21.	E. L. Aderhold, instructor	129 00	
		N. E. France, expense Grant Co. cow census	8 00	
June	8.	E. L. Aderhold, instructor	147 00	
		Fred Marty, instructor	145 00	
July	8.	E. L. Aderhold, instructor	143 00	
		Fred Marty, instructor	139 00	
		T. Corneliuson, instructor	70 00	
Aug.	5.	E. L. Aderhold, instructor	121 50	
		T. Corneliuson, instructor	125 00	
		Fred Marty, instructor	135 00	
Sept.	6.	E. L. Aderhold, instructor	151 00	
		T. Corneliuson, instructor	118 00	
		Fred Marty, instructor	115 00	
Oct.	11.	E. L. Aderhold, instructor	137 00	
		T. Corneliuson, instructor	115 00	
		Fred Marty, instructor	115 00	
		John Luchsinger, sundry expenses	15 80	
Nov.	5.	E. L. Aderhold, instructor	129 50	
		T. Corneliuson, instructor	107 00	
Dec.	6.	Fred Marty, instructor	10 00	
		E. L. Aderhold, instructor	64 50	
		T. Corneliuson, instructor	111 00	
1905.				
Jan.	23.	Fred Marty, instructor	130 00	
		T. Corneliuson, instructor	110 00	
Feb.	3.	T. Corneliuson, instructor	120 00	
	20.	W. D. Hoard, printing	26 10	
		Geo. W. Burchard, salary as secretary, etc.	303 37	
		Balance in hands of treasurer	1,024 60	
				$4,732 56

Approved September 22, 1905.

J. O. Davidson,
Acting Governor.

INDEX.

A.

B.

C.

D.

E.

F.

G.

H.

I.

J.

K.

L.

M.

S.

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