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OF THE VARIOUS

DEPARTMENTS AND INSTITUTIONS

For the Year 1912

VOLUME II

WATERVILLE
SENTINEL PUBLISHING COMPANY
1914

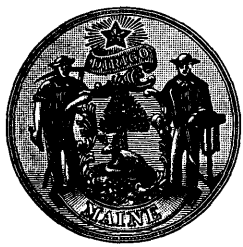
REPORT

OF THE

FOURTEENTH AND FIFTEENTH ANNUAL MEETINGS

OF THE

MAINE DAIRYMEN'S ASSOCIATION



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WATERVILLE
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1913

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OFFICERS

OF THE

MAINE DAIRYMEN'S ASSOCIATION.

1911.

PRESIDENT.

L. E. McIntire ..... East Waterford

VICE PRESIDENT.

H. G. Beyer, Jr..... Portland

SECRETARY.

Leon S. Merrill..... Orono

TREASURER.

Rutillus Alden ..... Winthrop

CORRESPONDING SECRETARIES.

C. R. Millett..... West Minot
Ira J. Porter..... Houlton
Chester P. Hamlin..... East Wilton
Norris L. Heath..... West Penobscot
Chas. S. Pope ..... Manchester
E. E. Light..... Union
John M. Winslow..... Nobleboro
F. H. Morse..... South Waterford
C. L. Jones..... Corinna
F. W. Leland..... East Sangerville
Frank S. Adams..... Bowdoinham
A. P. Howes..... Palmyra
E. C. Dow..... Belfast
C. L. Pike..... Lubec
John Pease ..... Cornish
F. W. Blanchard..... Cumberland Center

LIST OF MEMBERS

OF THE

MAINE DAIRYMEN'S ASSOCIATION.

Adams, F. S.,	Bowdoinham	Lemont, J. M. & J. P.,	West Bath
Alden, R.,	Winthrop	Libby, Frank,	Richmond
Allen, W. H.,	Buckfield	Light, E. E.,	Union

LIST OF MEMBERS—Concluded.

Anderson, S. B., Gorham, R. F. D. 4
Bachelder, C. H., Dexter
Bagley, Fred H., Troy
Bailey, B. A., Wiscasset
Bateman, L. C., Lewiston
Beyer, H. G., Jr., Portland
Bickmore, E. D., Stockton Springs
Blanchard, F. W. & Sons, Cumberland Ctr.
Bradford, E. L., Auburn
Bradford, T. B., Golden Ridge
Brett, B. C., Auburn
Buckley, J. P., Stroudwater
Burnell, Dexter, Cumberland Ctr.
Campbell, P. A., Orono
Carll, E. C., Augusta
Cleaves, J. D., Yarmouth
Corinth Creamery Ass'n, E. Corinth
Davis, W. H., Augusta
Deering, John M., Saco
Doe, C. H. & Son, Fairfield Ctr.
Dow, E. C., Belfast
Dunn, G. H., Norway
Dunn, V. E., Norway
Evans, S. G., Waldo
Fisher, C. C., Hudson
Foster, D. E., Augusta
Fuller, C. H., Norridgewock
Garland, L. E., E. Auburn
Gilman, A. W., Foxcroft
Guptill, Andrew J., Berwick
Guptill, Chas. A., Berwick
Hamlin, C. P., E. Wilton
Hamlin, C. S., Harrison
Hamlin, W. K., So. Waterford
Hanson, W. M., Richmond
Harris, Elmer E., Skowhegan
Haskell, Harry L., Auburn
Heath, N. L., West Penobscot
Holbrook, E. K., Mechanic Falls
Home Dairy Co., Portland
Hood, H. P. & Sons, Winthrop
Howes, A. P., Palmyra
Hunton, W. G., Readfield
Jewett, B. D., Whitefield
Jewett, E. C., Whitefield
Johnson, J. L., Harmony
Johnson, T. H., E. New Portland
Jones, C. L., Corinna
Jones, O. L., Corinna
Jones, R. O. **Winslow**
Leach, J. A. & Son, East Eddington
Leland, F. W., East Sangerville
Leland, W. E. & Son, Mechanic Falls
Longley, P. S., Solon
McEdwards, J. D., Bangor
McIntire, C. S., E. Waterford
McIntire, L. E., E. Waterford
McKenney, J. E., Wiscasset
Marshall, Leon O., Topsham
Merrill, H. H., Hebron
Millett, C. R., W. Minot
Mitchell, R. P., Kents Hill
Moore, J. Henry, Winthrop
Morse, F. H., Waterford
Moulton, H. M., Cumberland Ctr.
Ness, J. A., Auburn
Patten, R. T., Skowhegan
Pearl, Raymond, Orono
Pease, John, Cornish
Pierce, Ingraham C., Bingham
Pike, C. L., Lubec
Pike, W. W., Cornish
Plummer, A. L., Benton
Plummer, W. H., Richmond
Pope, Charles S., Manchester
Pope, E. C., Manchester
Porter, Ira J., Houlton
Purcell, C. W., Biddeford
Redman, R. W., Orono
Ricker, F. P., Turner
Rose, S. ..., Greene
Ryder, H. F., Auburn
Sanderson, A. L. So. Waterford
Smith, G. S., Monmouth
Smith, H. A., Litchfield
Sparkling Spring Creamery, Norridgewock
Spofford, Mrs. Alice, Greene
Stetson, W. C. & Son, Waterville, R. F. D. 40
Sweetser, H. P., Cumberland, Ctr.
Symes, E. E., Winthrop
Thompson & Leland, Dover, R.F.D.
Tilton, A. F., Auburn
Tripp, C. E., Ripley
True, J. W., New Gloucester
Tucker, Benj., Norway
Tucker, H. M., Canton
Twitchell, B. F., Fairfield Ctr.
Warren Creamery, So. Warren
Wheeler, Chester, Auburn
Whiting, D. & Sons, Bucksport
Whiting, D. & Sons, Pittsfield
Winslow, J. M., Nobleboro
Withee, Everett, Augusta
Woods, Chas. D., Orono
Worcester, W. S., Hallowell
Young, Robt. I., Skowhegan

REPORT OF PROCEEDINGS

OF THE

State Dairy Conference

AND

FOURTEENTH ANNUAL MEETING

OF THE

Maine Dairymen's Association

DECEMBER 5, 6, AND 7, 1911.

The annual State Dairy Conference was held at the Grange Hall, Norway Tuesday, Wednesday, and Thursday, December 5th, 6th, and 7th, 1911. The educational program was one of great interest and the attendance was perhaps the largest of any Dairy Conference held within recent years. The exhibits of dairy products and dairy machinery were very attractive and while the total number of exhibits of dairy products was not so large as in the preceding year, the quality was of an exceptionally high order.

TUESDAY EVENING, DECEMBER 5.

Music by Stearns Orchestra opened the exercises in Norway Opera House. Four selections were given during the evening and the gathered company departed for home with the strains of music lingering with them.

The following program was carried out:

Invocation offered by Rev. B. C. Wentworth of Norway.

ADDRESS OF WELCOME FROM THE NORWAY BOARD OF TRADE.

By Hon. Alfred S. Kimball.

Gentlemen of the Maine Dairymen's Association:

I desire to welcome your association to Norway in behalf of the Norway Board of Trade and of the citizens of the town. We desire to place the town and its people at your disposal. We will do everything to make your short stay with us pleasant, and if there is anything we have omitted that would contribute to your comfort we hope you will speak to us about it. Much has been learned concerning the science of agriculture since I was a boy; great improvements in methods, in tools and machinery used in farm work have been made; the telephone, rural free delivery, and other conveniences that enter now so largely into farm life have been added. Although in the extreme western part of the state and away from the large railroad centers we are glad your association had considered Oxford County and the town of Norway of sufficient importance to hold your regular meeting in this dairy part of Maine. Again we extend a glad hand to you and bid you welcome.

ADDRESS OF WELCOME FROM NORWAY GRANGE.

By H. D. SMITH, Master.

As Master of Norway Grange, a large and progressive institution, I desire to assure you—the Maine Dairymen's Association—that we are glad to have you with us. The meeting together of leading dairymen, the discussion of ways and means for improvement and advancement will prove to be of very great importance to the dairy industry. Norway Grange would do everything in its power to make this meeting a profit and success.

RESPONSE TO ADDRESSES OF WELCOME.

By HON. C. S. STETSON.

It is very gratifying to me to be able to meet and participate with you in this annual session of the Dairy Association of our state. It is particularly gratifying to note that we meet here in Oxford County.

No section of Maine surpasses your county in progressive agricultural development and there is no town in your county that surpasses Norway in the free, open-handed hospitality always extended visitors. In responding to the very cordial address welcoming this association to your town, I desire to thank you for all you have done to promote our comfort and to make our stay pleasant and profitable. And I know that I express the heartfelt sentiment of every visitor when I say that we were glad to come. We are happy now that we are here, and we are certain that, inspired by your zeal and earnestness in preparing for our coming and welcoming us to your town, this annual session will prove one of the most helpful and

progressive ever held in Maine. The agricultural possibilities of Maine are unlimited, and we are just at the beginning of this development.

Situated, as we are, near the greatest and best markets of the world, we may be absolutely certain that farming, and more especially dairy farming, can be remuneratively carried on in Maine, provided business methods are applied; if the haphazard, go-as-you-please method is eliminated, and a known-so plan adopted.

The art of agriculture today makes the science of agriculture necessary for its successful prosecution. The farm must be conducted on business principles and the last detail must receive the closest attention. The unproductive method or enterprise must be abandoned and the winner must take its place. Educated common sense applied to farming makes it certain that earnings and profits will keep pace with the development of the industries our conditions permit.

This good work is in its earlier stages. The time is coming when all farmers worthy of the name will join hands in offering the best to every tiller of the soil. More productive farms, more suitable farm homes, more acceptable farm conditions, better roads, more helpful schools and a nobler citizenship—these are our ideals. To their realization we pledge our lives and dedicate our posterity.

I am here as the representative of a strong, vigorous organization of nearly 60,000 people banded together for the purpose of educating and elevating the American farmer, and I pledge you my word that we have tried in the past, and intend in the future to exemplify the "get together" spirit for more ideal methods for promoting agricultural development in Maine.

Again I thank you for the cordial welcome extended to us, and I express the hope and the belief that this annual meeting of the Maine Dairymen's Association may be far reaching in results and productive of great good to our state.

EDUCATION TO PREVENT POVERTY, DISEASE, AND CRIME.

By Dr. Robert J. Aley.

The fundamental purpose of the school is to eternally wage warfare against ignorance. As a means of preventing poverty, disease, and crime it must be one of the most powerful single forces of organized society. But it cannot act alone. Its work is defeated if the other social forces are not in accord, and do not work for the same ends. For instance, if the teacher tries to inculcate the principle that there is law in everything and that breaking a law will surely be followed by a punishment, and the people persist in making a hero of a self-confessed murderer, sending their flowers and votive offerings to his cell and visiting him, the effect of that teacher's instruction is nullified. The school is a great force of humanity, but it must be used in harmony with the other social institutions.

The first things done by early settlers in New England were to have a town meeting, to build a church, and to open a school. Ever since it has been an American principle to educate the children of the country. Americans have always believed in the efficacy and the power of education; they have given their money freely that free schools might be established. So strongly have they believed in the principle of education that they have forced the very small minority, which does not favor education, in almost every state in the union, to educate their children.

Americans have pinned their faith to education; they believe that it is essential to the happiness of society, that it is necessary in order to lift up the masses to the higher levels of living. Whenever there is something radically wrong with a nation that country is sure to meet with disaster. It may be weakness and ignorance at the bottom and it may be corruption at the top. Of the two I think that weakness and ignorance are the more fatal.

Prevention of ignorance by rational means is better than a cure. The southern people, in fact the people of all the nation, remember the disastrous results which followed the granting of

the franchise to the freed negroes after scores of years of slavery. They realized what it was to grant power to men who had not slowly acquired it, who had not achieved the privilege. The mark of a pen was not enough to make 4,000,000 men free, who had not gained their freedom by slow, painful growth, the way in which all substantial things of this earth are obtained.

Booker T. Washington has been confronted with a great problem—that of giving real freedom to those who were granted legal freedom.

Education is difficult to define. Education is a changing thing, it is difficult to catch, hold and define. I should give as a definition, "An eternal warfare against ignorance." Man is born into this world tremendously ignorant. Education in its literal sense means to lead out, to draw forth, to make the individual realize the powers within him. As the race lives it learns. Men have gradually got the idea that there is a common consensus of knowledge, the consciousness of which is valuable for the youth. The school is the place which has been founded to teach the facts that time has proved to be necessary. The school is not the only means of educating, but so far, it is the best that organized society has been able to furnish in an economical way. The school ought to be a splendid example of all that is best in scientific achievements, such as the most advanced heating, lighting, and ventilation. I know that there are hundreds of thousands of school buildings in this country which are eyesores, examples of everything bad in lighting. When a child can leave the schoolroom after spending six or seven hours within as fresh and as buoyant as when he entered in the morning, that school is a success. The schools have made great strides in material equipment in the past quarter of a century.

There are many people who think that only the bad things are contagious—whooping cough, the measles, slang, profane language, and so on. But it is true that good things are exactly as catching as the other kind. Wholesome surroundings in the school spread into the neighborhood and leaven the homes of the vicinity.

There is a law in everything. I once boarded with a very estimable lady who is always remembered with pleasure. The only flaw in her domestic scheme was that she didn't know the

law of making bread. She thought that simply throwing a few ingredients together, and placing them to rise somewhere—it didn't make much difference whether the place was hot or cold—was all there was to making bread. Well, once in two or three weeks we had real bread for dinner—the rest of the time it was bread by courtesy.

Again I happened to be in a San Francisco home where a Chinese cook prepared the food. The Chinese have always believed in a law for everything, as far back as Confucius. That man's bread was as good as can be made and it was the same every day. The reason was that he knew the law and obeyed it. If he had not he would have met failure, just the same as my former landlady.

The value of a well known trademark is based upon the fact that the manufacturer and his workmen have obeyed the law in making the product. Sheffield on an edge tool means that every man connected with the Sheffield factory has observed the law of steel in its making. The result is a perfect tool.

One aim of the school is to teach the importance of obeying law, to have heed of the ultimate thing rather than the immediate, that it is better to go out and earn $10,000, which is possible by industry, than to take unlawfully the $100 that is within reach. In the school the son of the millionaire, the poet, the statesman, and the child of the washer-woman meet on the same level. In a New York schoolroom on the opening of the term there were 27 nationalities represented and 27 different languages. By the end of that term, all were speaking English and all sang "My Country 'Tis of Thee" in unison. Considering poverty, the school puts in the heart of every boy and girl to be ambitious to lift himself from his present condition, to battle with poverty and overcome it, knowing that the disgrace is not being poor, but staying poor. If organized society. however, continues to make it worth while to be poor, the schools are baffled in this attempt. It was recently found in Chicago that there were 5000 people receiving aid from the city, each one of whom was in comfortable circumstances.

As long as crime is tolerated, so long as people continue to send flowers to self-confessed criminals, the effort of the school in teaching obedience to law is made useless.

The school cannot take the place of the home authority as some parents think. I know of a mother who called upon a teacher one day and said: "Miss Blank, I thought of calling you up on the telephone at 2 o'clock last night." When asked why, she answered that her daughter had gone on a sleigh ride and had not returned up to 2 o'clock. "I thought I would let you know, Miss Blank, for I didn't think you would allow such a thing." The school does not exist to teach religion, although it can lay the foundation in character of principles of truth and righteousness that cannot be excelled.

In its fight against ignorance, poverty, disease, and crime the school needs the aid of all the forces of society.

WEDNESDAY, DECEMBER 6.

ANNUAL ADDRESS OF THE PRESIDENT.

By W. G. HUNTON.

The natural conditions for dairying in Maine for the past year have, I think, been generally favorable. The early frost in some cases injured late pasturage and the quality of silage, but on the other hand it has been in most sections a clover year, and a good season for cutting and curing hay will insure prime hay for winter feeding. As a rule our dairy farmers are recognizing the value of early cut hay and governing themselves accordingly. The prices of all dairy products have been well and evenly sustained, with every indication of a good market in the future; while the present abnormally high price of cows shows only two well the fallacy of the habit our farmers have fallen into of selling their heifer calves when veal is high. All of these comments upon our business must necessarily lead us, as thinking men, to ask a few pertinent questions.

Is this organization, representing as it does the practical dairymen of our state, satisfied with the present condition and future outlook of our business? If not, what can we do at this meeting to improve the present and assist in bettering future conditions? The natural tendencies of all business lines are

generally influenced by certain laws that are, as a rule, inflexible. Supply and demand in all the staple products are the great factors that we agree regulate the price, especially where the product is perishable. A sharp and sudden rise and decline in the price of any article of trade render the business uncertain and it does not appeal to the average business man as the best to which to devote his energies and capital. The requirement of large capital to properly conduct a business necessarily restricts the number who engage in it. A business in which there is a large amount of waste to be utilized, or one that impoverishes the capital quickly, causes many to hesitate in beginning and to abandon when discovered, where the conditions surrounding production leave the margin of profits too small as compared with other available business conditions.

There are a few general laws that regulate production in a strict business sense. Grant me your attention for a moment while we strive to understand how they will apply to dairying in Maine at the present time.

First the law of supply and demand. In studying the reports on the dairy supply for the past ten years, we see in the early part of the decade only where for the fraction of the year—in the summer months—this law had any effect. For the past five years the rapid increase in the cream trade for the summer months has held the supply within the demand, and the average wholesale price of butter fat, the acknowledged standard on which dairy estimates are made, has increased thirty-five per cent.

Sharp and sudden fluctuations in price at different seasons and in succeeding years. If we again study the report, we find a uniformity for the past six years that is remarkable in so perishable a product. There is no feature of it that would deter the business man from increasing his output, but rather the entire trend of the market would encourage a larger production.

The business has not required and does not require a large capital, and its profits can be realized twelve times a year. An investment that savors of usury. A business that admits of a beginning with small capital and rapid increase as the investor acquires experience. Furthermore, it is not a business in which excessive waste to be cared for and turned into money need cause any apprehension. It rather suggests a quick and feasi-

ble way to increase the original capital at the least possible expense in two ways—by raising hogs and increasing the feeding ability of the farm, or by the raising of calves to increase the working capital.

Impoverishment of capital needs no mention. The law of nature cannot make a mistake, and the dairy farmer comes the nearest to conforming to that law of any business man known in history.

And lastly, the margin of profit is, I believe, the true issue that we must consider in view of the facts that while the better and improved methods of feeding, care, and breeding increase the productiveness of the individual cow, the gradual and persistent decrease in number of cows has certainly made our assertion in the beginning reasonable. If, then, the profits of the business are not sufficient to hold those already engaged in the dairy business in our state and encourage others to engage in it as a special line of farm work, what is the cause? Is it the manner of marketing our products, the quality of the product, or in the cost of production? For years when we were producing butter fat at an average price of less than twenty cents per pound, we said it was because the individual did not understand when and how to best place his product where it would command the best price. But the numerous creameries scattered all over our state have solved that problem, and no dairyman need hunt for a market. With the coming of the creameries and the general advancement of progressive agriculture, the quality has acquired a standard of which we are all proud. Must we, then, acknowledge the fact that we are not producing butter fat as economically as we ought, or as it is possible?

For eight months in the year, butter fat in Maine is largely produced from our cows from highly concentrated food, largely purchased from outside our state, which necessarily gives the margin of profit to the railroad and large milling corporations. If the profits paid to these two corporations could be held by the dairymen of our state, would it not in itself make dairying a more satisfactory and sought for occupation? Is it possible for us to accomplish this change? The silo has done much to relieve the problem of expensive roughage and supplant the hay crop. Is it not possible that we have held the necessity of feed-

ing a narrow ration to be of such importance that we have not attempted to ask our cows to accept a wider ration of less expensive feed that can be produced on our own farms, which, though it might somewhat reduce the annual production of the individual, would increase our aggregate profits? Is this an unreasonable proposition to ask our Experiment Station to demonstrate for us? The scarcity and increase in wages for hired help is our problem. The inventor has in other lines of farming overcome to some extent this difficulty, but with the care and milking of cows it is not easy to overcome. But if by substitution of home raised feeds we can eliminate some part or the whole of the costly imported protein feeds, we shall change the entire business of Maine dairying.

REPORT OF THE SECRETARY.

LEON S. MERRILL.

During the past year the executive committee has held three meetings, as follows:

May 12, 1911, at Auburn.

September 5, 1911, Lewiston Fair Grounds, 10 o'clock in the forenoon.

September 5, 1911, Lewiston Fair Grounds, 3 o'clock in the afternoon.

And a special meeting of the association at Lewiston City Hall, October 20, 1911, at 11 o'clock in the forenoon, at which a good representation of the membership was present.

No Dairy Institutes have been held because of lack of funds. The association instructed the officers to hold the County Dairy Institutes again this year and it seems very unfortunate that satisfactory arrangements could not have been made for holding them.

While it did not seem advisable for the Maine Seed Improvement Association to hold its annual meeting during the same week as this association, it was expected that an exhibit of seeds would be made, but at the meeting of the Seed Association held

at Waterville the week before last it was decided not to place any more exhibits before the next annual meeting. The Secretary regrets the necessity for this action and hopes some arrangement can be made for uniting next year.

Complying with the instructions given at the last annual meeting the secretary issued a call for a meeting of representatives of the various agricultural associations and organizations in the State to meet at Augusta, January 18, 1911. At that meeting more than 60 people were in attendance and after a full discussion it was voted to organize a Federation of Agricultural Associations and a special committee was appointed to draft a form of organization and to report at a later meeting. The second meeting was held February 8, 1911, at Augusta, when the organization was completed, setting forth the purpose of the federation, its form of organization and government.

Recommendations.

First—That time be given during this meeting for the reading of the essential parts of the organization and purposes of the Maine Federation of Agricultural Associations, and if this association approved of the general plan, to elect representatives to the Federation with instructions to give to it active support.

Second—That this association favor some plan whereby the exhibits made by such associations as the Dairymen's Association, the Pomological Society and Seed Improvement Association be held during the same week and at the same place, dividing the time equitably for program purposes. It might and probably would be necessary for the exhibit to cover an entire week.

Third—That this association keep in touch with the movements now on foot to secure Federal aid in behalf of agriculture to be expended in each state for extension work under the direction of the agricultural colleges and to give its active support to such bills as appear to best meet the needs of the state.

In closing I desire to call the attention of the association to assistance given the present year by

First—The newspapers of the State in giving publicity to this meeting.

Second—The special premiums offered by various newspapers and companies.

Third—The special rates given by the railroads of the state.

The many courtesies extended by the Norway Board of Trade and Grange are so plainly before us that the Secretary need not use any time in commenting on them.

The report of the Secretary was accepted and the recommendations referred to the Committee on Resolutions. At this time Pres. Hunton announced the Committee on Resolutions as follows: F. S. Adams, L. E. McIntire, C. S. Pope.

TREASURER'S REPORT.

NORWAY, ME., DEC. 5TH, 1911.

R. Alden in account with Maine Dairymen's Association.

Cash on hand Dec. 8, 1910	$181 62
Cash received	88 00
Total	$269 62
Cash paid out	54 25
Balance on hand	$215 37

The treasurer's report was accepted.

REPORT OF COMMITTEE ON NEW DAIRY BARNS AT THE UNIVERSITY.

To the Maine Dairymen's Association:—

Your special committee on "New Barns at the University of Maine" in company with a similar committee from the Maine Live Stock Breeders' Association visited the University, inspected the barns and grounds and being convinced that new

barns were actually needed, a conference was held with the trustees of the University. The trustees agreed with the committee but stated that no funds were available for the purpose. Under the circumstances the only thing left for your committee to do was to make an appeal to the legislature and a bill was introduced, carrying with it an appropriation of twenty thousand dollars ($20,000.00). It is understood that the committee on agriculture to whom the measure was committed gave their approval but the bill was referred to the next legislature.

Your committee recommend that the association exert every effort to secure from the next legislature a suitable appropriation for the erection of new barns and the renovation of the old ones now on the farm at the University of Maine.

Signed by the committee,

L. E. McINTIRE,
JOHN PEASE,
LEON S. MERRILL.

On motion of Mr. John M. Deering the recommendation of the committee was adopted and the report accepted.

Voted that the committee on barns be continued as a legislative committee on barns at the State University and that the Maine Live Stock Breeders' Association be requested to continue their special committee on barns for a similar purpose.

MAINE PASTURE PROBLEMS.

In the absence of Mr. Edward A. Stanford, Expert Assistant, Office of Farm Management, U. S. Dept. of Agriculture, the discussion of this important subject was opened by Mr. Frank H. Morse of Waterford who said in part: "The pasture situation in Maine is like the man who having made a single deposit of cash in the bank keeps on drawing checks without making any more deposits and in consequence his deposit is soon all checked out." We have been told to be careful and

not to overfeed the pastures but there is no danger of that if we put something back. A few years ago we turned some of our breeding hogs into the pasture. They went at the pasture brakes and soon had them all rooted up and now it is one of the best pasture pieces we have on our farm. The hogs dug out the brakes and we cut out the birches with the result that a good growth of feed came in. All wet places should be drained. Chemicals spread on pasture land will pay if judgment is used in their application.

It should pay as well to grow good pasture feed and let the cows eat it in the pasture as to cut it all to be fed in the barn later in the dry form."

WEDNESDAY AFTERNOON.

Judging Contest—Dairy Products.

This contest was participated in by fourteen men. The prizes offered consisted of—

First prize—Silver cup. *Second prize*—One year's subscription to "Maine Farmer." *Third prize*—One year's subscription to "Maine Farmer."

The awards were made as follows:

C. R. Leland, Mechanic Falls, first. J. D. McEdwards, Bangor, second. T. H. Johnson, East New Portland, third.

This contest was an exceptionally interesting one for the reason that the scores of many of the contestants approximated each other very closely.

COMMON DISEASES OF THE DAIRY COW.

Dr. J. A. Ness.

Note: It is to be regretted that we cannot reproduce entire the very practical address given by Dr. Ness.

Dr. Ness said in part: "Why is it when an epidemic breaks out in our own families so many escape? It is because those who are not taken ill have in their systems the elements of perfect health that prevent them from taking disease. In preventing diseases in the dairy cow, the first thing is to get her in perfect health. In too many dairy barns we find imperfect ventilation and light, too much filth, dust and dirt. The cow to be healthy has got to be kept in a clean place. We can't determine to what degree sunlight will prevent disease, but it will greatly help. I am talking about the common tie-up such as I have myself. Every year the dairyman should give his tie-up a thorough cleaning. Whitewash or lime is good for sweetening and cleaning. You don't want to think that because some millionaire has a good King system of ventilation you cannot have a well ventilated tie-up in the ordinary barn with a simple ventilating system.

"Don't overfeed your cows in any way. Starvation will bring a cow to her feed if she is off feed quicker than anything else. In treating a dairy cow, the main thing is a good dose of salts. For the first dose a cow of a thousand pounds ought to have two pounds. Epsom salts are safest.

"A farmer can well spend a little time grooming. The skin of the cow is a most important excretory medium. If you have a good clean tie-up, you are not liable to get any diseases, but if you do get them, they are half treated in such a tie-up. If the cow is off her feed, don't keep putting feed in front of her. Take it away if she has any. Get in the habit of so looking after your cows every day that you will know as soon as there is anything the matter.

"In parturition there is more likelihood of trouble, for the cow is then in a tender condition. Use your common sense. In swellings of the udder, don't be too severe. In this season of the year, bathings of hot water are apt to have a bad after effect. The best things we can give are iodide of potash and aconite. See that her bowels move often; clean her out well.

"For garget, iodide of potash, with vegetables for feed, is probably the best treatment. Probably the greatest nuisance is cow pox. This is traded around by the milkers' hands. The best thing is a good disinfectant and cleanliness for both cows and milkers. The milkers should wash their hands after milking each cow.

"In milk fever the most important thing is to make the cow's bowels move. Give her some vegetable feeds. The heavier feeds should not be given at this time. The modern treatment is inflating the udder with sterilized air. The dairyman with thirty cows cannot afford to be without his own apparatus. A chill will bring on milk fever quicker than anything else.

"There are two kinds of milk fever. One of the first things you will notice is a little staggering in the gait. In the other case, there is first a little drowsiness. This is the more common. Apply the air before the cow is down.

"Tuberculosis is something that we buy and sell like the cows. You can reasonably keep clear of the disease with the tuberculin test. But with a properly ventilated and properly kept stable, you can keep down this disease as well as every other disease. Many doubt the efficacy of the tuberculin test, but I have used it enough to be certain that it is the best thing to use.

"I was called upon to test a herd of about fifty cows which showed absolute freedom from the disease. Later a cow from Massachusetts was brought into the herd, and in a little over a year eighteen were in bad condition and condemned. The Massachusetts cow was the worst one in the bunch. This shows the readiness with which the disease is spread.

"Abortion is the worst disease of all. The tie-up well kept and well ventilated is half the prevention. Disinfection is most important. Abortion is the greatest source of loss we have. Carbolic acid is probably the best thing to feed the cow—a teaspoonful, a few times. I have known a case where the disease was actually prevented by the use of carbolic acid in that way.

"Scours in calves as well as lice can be kept down by disinfectants and whitewash. Clean the calf pen frequently. It is well to whitewash several times a year.

"A good system of ventilation is the use of the muslin curtain over the window which is hinged at the bottom."

CREAMERYMEN'S SESSION.

MR. W. K. HAMLIN, President Maine Creamerymen's Association, presiding.

In assuming the chair Mr. Hamlin expressed the desire felt by the creamerymen of the state to coöperate with the Dairymen's Association in promoting the dairy interests of the state. "These two associations have always worked in harmony in the past and will continue to do so in the future.

We have an interesting program before us and I will only occupy so much of the time as may be necessary in introducing the speakers."

DEBIT AND CREDIT WITH THE DAIRY COW.

R. T. PATTEN.

I have three little girls at my home, aged 6, 8 and 13 years. They are all in my employ, and receive very modest salaries for the performance of simple household tasks. The oldest is the bookkeeper and I hold in my hand the record which she keeps. Each Saturday evening, the little folks meet in my study. They bring this book and their purses with them. The entries are made for the week, the money is counted and each account is made to show what has been received, what has been paid out and the balance on hand. This is bookkeeping in its simplest form and many a New England housewife keeps such an account of the family income and expenditure. Many farmers keep a similar record and some carry it so far as to be able to tell what the crop on each particular piece of ground costs and the value of the yield. We dairymen, perhaps, more than any other class of agriculturists, have come to keep careful records of our herds, so that we know for the most part what each cow consumes for food and what she yields us in milk and butter fat.

I never owned a cow until November 1910, but I have had to do with accounts, for many different kinds of business, all my life and it is only through a natural taste for figures that I have the courage to appear before such an audience of dairy experts with the hope of saying anything of interest or profit. Perhaps you will be disposed to be

"To my virtues ever kind
And to my faults a little blind"

if I own that my own sense of ignorance as to dairying is responsible, in a large measure, for the study I have made the last year of accounts in relation to that business. I have come to understand it was doubly important for me to know to the last cent how my affairs were progressing. You veterans in the business, knowing intuitively just what is going on all the time as to feeds and milk production, would get along with far less records than I could.

What I have to say that is new to any of you will be chiefly in relation to items of cost and income, pertaining to the dairy cow, not often taken account of. Among them are risk, depreciation, insurance, interest, taxes, upkeep of farm house, cost of stabling, bedding, keep of bull, grooming, stable work, care of product and ice; also, as to income, manure and progeny. Everyone of these items has its effect upon our problem. It does not matter that we own the house we live in and the stable in which we keep the cows; the business must provide a profit that will pay all charges and renew them when they wear out. It does not matter if we do the work in person for the whole herd; the business must pay us at least 20 cents an hour for our time or we could do better at some other occupation. An accurate knowledge of these items may be had by a very simple system of accounting and will, I am sure, pay any of us for the little trouble involved.

I am accustomed to consider risk and depreciation together. A cow is liable to die or become valueless as a dairy animal, any time. In any event, her usefulness, on the average, will not extend beyond 10 years. It is proper then to charge off 10 per cent. of her value every year under risk and depreciation.

Our cows, as well as the buildings they are in, are liable to destruction by fire. We can run this risk or pay some company for assuming it for us. In the latter case it will cost us about $2.50 per year on each $1000 of value. This fire risk, whether we assume it ourselves, or pay for it, is always present, and the cow must pay it out of her milk production. I usually put the taxes in the same column. This charge may be reckoned, in most Maine towns, at 2 per cent. per year on the assessed value. When you compute insurance or risk, it should be upon what you could sell the cow for; when you compute taxes, it should be on what the assessor values her at.

Now as to the cow's share of the farm house. We don't give her shelter there, though some of her ancestors were doubtless so quartered, but it is plain that we could not keep the cow if we did not also provide a shelter for man who cares for her. There is no dodging it, the cow must share in what it costs to keep the farm house going. I do not refer to the food, fuel, furniture, etc.; these come in when we charge the cow for the labor of taking care of her. I mean the home, the house itself, the interest on it and what it costs to keep it in repair. Ten per cent. is a handy number to figure with and, in this instance again, it is just about the thing to charge to the farm house to keep it going. Suppose the house is worth $1500, 10 per cent. thereon would be $150 per year. We won't charge Mooley with all of this as the house is just as necessary to the orchard, the corn field and the potato crop as it is to the dairy. The proportion to be assigned to the cow will vary, but perhaps one-third would hit the conditions on most Maine farms.

The cow must pay for her stable, say 10 per cent. on $100 for each member of the herd. It will take about a ton of straw to bed her with for a year and she must pay for that. We have to keep a herd bull or pay our neighbor for doing so and that is a legitimate charge to the cows. The cows should be groomed, taking about five minutes a day for each animal. The tie-up must be kept clean and in order and the labor paid for, as well as the labor of milking, separating, caring for the separator, milk cans, etc. Ice must be provided for the care of the product and its cost charged to the dairy account.

Now our cow under discussion has been patient while we have charged her with a lot of things, everyone of which creates expense, and some of which she very seldom hears mentioned, and it's about time we took up the matter of income. The cow always gets credited with the milk and butter fat, and sometimes with the value of her calf. There is one other valuable product, the manure. The calf is worth from one-half to one cent a day, if from a grade cow, and from five to ten cents a day if from a registered cow by a registered sire. The manure is worth eight cents a day for a one thousand pound cow.

I have said practically nothing about feed because, where any accounts at all are kept, the food consumed is always reckoned.

In every herd there will be also a slight charge for the service of a veterinarian and for medicine. I am inclined to think that I have made some of the other items broad enough to include whatever that would be, but that is not the way to handle it. It would be far better to know what the veterinary charge was, all by itself. I propose to so consider it when I have data enough before me to make such consideration fairly accurate.

There is another matter that I have made note of which ought to come into the calculation. It is the gain or loss in weight. If we find that a cow is 100 lbs. lighter at the end of a year than at the first of the year, we should reckon a portion of the beef price of this 100 lbs. as a loss. If we were to sell her for beef, we should get about $5 less for her. If we continue her in milk, we must so feed her as to stop the decline in weight and perhaps to put part or all of it back on her body. In either case, she is worth less after the 100 lbs. is gone. I have not made up my mind as yet just how it should be charged or credited.

I note that it is customary to ask questions at our dairy meetings, and I am sure that more information gets distributed through this custom than by the uninterrupted delivery of any speech or paper. Questions on what I have said will be gratifying to me for I shall take them as evidence that I have aroused some interest. Nevertheless, sometimes questions from the audience lead to embarrassment. You will recall Huckleberry Finn's experience at Sunday school, as related by Mark

Twain. You know Huck was not a constant attendant but by some mischance he got in the lime-light on the day that a noted churchman from another state was visitor. This dignitary was asking questions and of Huck he demanded to know the names of the two apostles who were the most beloved by the Saviour. Some in the audience were amused and others nearly fainted when he replied "David and Goliath." Now I could have beaten Huck in knowledge of the Scripture but I don't know as I can relatively do any better than he did in a round table talk about cows. I have tried to call your attention to items that make up the cost and the income of dairying to completeness. The proportion they bear to each other will determine whether or not dairying pays and how much it pays. The preparation for this talk has impressed its various features upon my mind as nothing else could. I only hope what I have said may have profited you in some proportion to what I have been benefited.

TABULAR RECORDS.

These records represent the actual receipts and disbursements for a herd of 15 cows for November 1911. They represent but one month out of 12 and final conclusions cannot be based on them as to profit or loss that any individual of the herd may show in a full year. They are chiefly designed to show certain items of income and expenditure that are usually disregarded in accounts with the dairy herd.

TABLE I.

Cows.		Risk and Depreciation at 10% annually.	Percentage Charges— Daily insurance and taxes.	Interest at 5% annually.	Total.
No.	Value.				
1	$175	.048	.003	.024	.075
2	175	.048	.003	.024	.075
3	175	.048	.003	.024	.075
4	150	.041	.003	.020	.064
5	70	.019	.002	.010	.031
6	75	.020	.002	.010	.032
7	65	.018	.002	.009	.029
8	75	.020	.002	.010	.032
9	35	.008	.002	.005	.015
10	85	.023	.003	.010	.036
11	60	.016	.002	.009	.027
12	75	.020	.002	.010	.032
13	50	.013	.002	.007	.022
14	45	.012	.002	.006	.020
15	150	.041	.003	.020	.064
Av.	$1,460 per cow	.395 .263	.036 .024	.198 .013	.629 .042

In Table 1, the 10 per cent annual charge is counted upon to replace each animal once in 10 years. A cow does not have 10 years of productive life, on the average, but her beef value at the end of her dairy life will probably more than make good this deficit. Insurance is reckoned at $2.50 per thousand per year; taxes at 2 per cent. on the usually assessed valuation.

TABLE II.—FIXED CHARGES—DAILY.

No.	Percentage charges from Table I.	Farm-house charge.	Stabling.	Bedding.	Ice.	Service of bull.	Total.
1	.075	$.01	.027	.014	.003	.010	.139
2	.075	.01	.027	.014	.003	.010	.139
3	.075	.01	.027	.014	.003	.010	.139
4	.064	.01	.027	.014	.003	.010	.128
5	.031	.01	.027	.014	.003	.003	.088
6	.032	.01	.027	.014	.003	.003	.089
7	.029	.01	.027	.014	.003	.003	.086
8	.032	.01	.027	.014	.003	.003	.089
9	.015	.01	.027	.014	.003	.003	.072
10	.036	.01	.027	.014	.003	.003	.093
11	.027	.01	.027	.014	.003	.003	.084
12	.032	.01	.027	.014	.003	.003	.089
13	.022	.01	.027	.014	.003	.003	.079
14	.020	.01	.027	.014	.003	.003	.077
15	.064	.01	.027	.014	.003	.010	.128
Av.	.629 .042	.15 .01	.405 .027	.210 .014	.045 .003	.080 .005	1.519 .101

10 per cent. per year on one-third of the value of the farm house is charged to the dairy herd. The other two-thirds are assumed to be chargeable to other departments of farm operations. Stabling is taken at 10 per cent. on $100, it being assumed that a stable for 20 cows could be built and equipped for $2000. Bedding is counted at the value of one ton of cut straw a year for each cow. Two-thirds of the cost of filling the ice house, with the same fraction for description of the buildings, is charged to the dairy herd, the other third to the farm house.

TABLE III.

Cows.		Cost at 20c per hour.	*Labor, grooming and stable work.	Cost at 20c per hour.	Care of product.	Cost at 20c per hour.	Total.
No.	Minutes to milk.						
1	24	$.080	16 Min.	$.053	7 Min.	$.023	.156
2	14	.046	16	.053	7	.023	.122
3	12	.040	16	.053	7	.023	.116
4	14	.046	16	.053	7	.023	.122
5	10	.033	16	.053	7	.023	.109
6	10	.033	16	.053	7	.023	.109
7	18	.060	16	.053	7	.023	.136
8	16	.051	16	.053	7	.023	.127
9	12	.040	16	.053	7	.023	.116
10	12	.040	16	.053	7	.023	.116
11	15	.050	16	.053	7	.023	.126
12	10	.033	16	.053	7	.023	.109
13	10	.033	16	.053	7	.023	.109
14	12	.040	16	.053	7	.023	.116
15	–	–	16	.053	7	–	.053
	189	.625	240	.795	105	.322	1.742
Av.	13.5†	.044†	16	.053	7	.023	.116

* Morning and evening.
† Average for 14 cows.

It will be noted that the hard milker has to answer for the extra time it takes to make her yield her product.

TABLE IV.—FEEDING COST—DAILY.

	Grain mixture No. 1			Roughage.
400 lbs.	Cottonseed meal at	$1 72	$6 88	
300 lbs.	Gluten	1 62	4 86	
800 lbs.	Mixed feed	1 57	12 56	Hungarian at $10 per ton.
15 lbs.	Fine salt		11	
1515 lbs.	Average price of	.0161c	$24 41	

No.	Lbs. grain.	Cost.	Lbs. Hungarian.	Cost.	Total feed cost.	Month of lactation period.
1	10	.161	20	.100	.261	5th
2	8	.128	20	.100	.228	1st
3	10	.161	20	.100	.261	3rd
4	3	.048	15	.075	.123	6th
5	10	.161	15	.075	.236	6th
6	8	.128	15	.075	.203	8th
7	8	.128	15	.075	.203	9th
8	8	.128	15	.075	.203	10th
9	8	.128	12	.060	.188	5th
10	2	.032	12	.060	.092	9th
11	6	.096	12	.060	.156	8th
12	2	.032	12	.060	.092	13th
13	8	.128	12	.060	.188	7th
14	8	.128	12	.060	.188	4th
15	1	.016	10	.050	.066	
	100	$1.603	217	1.085	$2.688	6.7*
Av.	6.6	.106c	14.4	.072	.179c	

* Of 14 cows; No. 15 is a heifer.

This table is prepared so that the same herd, under a system where every item is accounted for, may be noted under the more usual method of charging simply what is fed and crediting only the milk production. The latter method, of course, makes very much the better showing.

TABLE V—INCOME DAILY.

No.	Lbs. skim milk.	Value at ½c lb.	Lbs. butter fat.	Value at 35 c lb.	Value of calf.	Value of manure.	Total income.
1	21.0	.052	.667	.230	.100	.12	.502
2	29.0	.075	1.100	.385	.100	.12	.680
3	23.5	.060	1.070	.370	.100	.09	.620
4	8.0	.020	.208	.072	.100	.08	.272
5	18.5	.045	1.170	.410	.006	.07	.531
6	14.5	.035	.805	.280	.006	.07	.391
7	14.5	.035	.703	.245	.006	.08	.366
8	18.5	.045	1.073	.375	.006	.08	.506
9	9.5	.023	.604	.210	.006	.08	.319
10	2.0	.005	.106	.036	.006	.08	.127
11	18.0	.045	1.000	.350	.006	.08	.481
12	8.0	.020	.505	.177	.006	.08	.283
13	13.5	.033	.980	.340	.006	.06	.439
14	14.5	.035	.804	.280	.006	.06	.381
15					.100	.08	.180
	213	.528	9.795	3.76	.56	1.23	6.078
Av.	14.2	.352	.655	.251	.037	.082	.405

TABLE VI—PROFIT AND LOSS—DAILY.

No.	Fixed charges.	Labor cost.	Feeding cost.	Total cost.	Total income.	Gain.	Loss.	Due to Freshen.
1	.139	.156	.261	.556c	.502c	.....	.054c	.....
2	.139	.122	.228	.489	.680	.191	.....	.....
3	.139	.116	.261	.516	.620	.104	.....	.....
4	.128	.122	.123	.373	.272	.....	.091	Feb. 23
5	.088	.109	.236	.433	.531	.098	.....	May 11
6	.089	.109	.203	.401	.391	.....	.010	Jan. 13
7	.086	.136	.203	.425	.366	.....	.061	Mar. 19
8	.089	.127	.203	.419	.506	.087	.....	.....
9	.072	.116	.188	.376	.319	.....	.057	Mar. 8
10	.093	.116	.092	.301	.127	.....	.174	Dec. 16
11	.084	.126	.156	.366	.481	.119	.....	June 3
12	.089	.109	.092	.290	.283	.....	.070	Jan. 17
13	.079	.109	.188	.376	.439	.063	.....	July 1
14	.077	.116	.188	.381	.381	.....	.....	August 1
15	.128	.053	.066	.247	.180	.....	.067	Jan. 18
	$1.519	$1.742	$2.688	$5.949	$6.078	.73c	.584c	
Av...	.101c	.116c	.179c	.396c	.405c	(Net)....	.146c	
						.73	.73	

TABLE VII—FEEDING COST WITH MILK PRODUCTION—DAILY.

No.	Breed.	Weight.	Total feed cost.	Value of milk produced.	Gain.	Loss.
1	Holstein	1300	.261	.282c	.021	.....
2	Holstein	1188	.228	.460	.232	.....
3	Holstein	1082	.261	.430	.169	.....
4	Holstein	1106	.123	.092	.....	.031
5	Grade Jersey	865	.236	.451	.215	.....
6	Grade Ayrshire	898	.203	.335	.132	.....
7	Grade Guernsey	1052	.203	.280	.077	.....
8	Grade Guernsey	1015	.203	.420	.217	.....
9	Grade Jersey	1004	.188	.233	.045	.....
10	Grade Jersey	1056	.092	.041	.....	.051
11	Grade Jersey	840	.156	.395	.239	.....
12	Grade Jersey	991	.092	.197	.105	.....
13	Grade Jersey	768	.188	.373	.185	.....
14	Grade Jersey	730	.188	.335	.147	.....
15	Holstein	976	.066	.....	.....	.066
		14871	$2.688	$4.324	$1.79	.148
	Average weight	991 Lbs.	.179c	.....	.....	.....
					Net gain	$1.642
					1.79	1.79

This table is prepared so that the same herd under a system where every item is accounted for, may be noted under the more usual method of charging simply what is feed and crediting only the milk production. The latter method, of course, makes very much the better showing.

WEDNESDAY EVENING.

ANNUAL BANQUET.

The annual banquet was prepared by Norway Grange and under their skillful management this event proved to be one of the most succesful functions of the kind ever held by the Maine Dairymen's Association. The post prandial exercises consisted of responses to toasts, readings by Mr. A. E. Morse of South Paris and music by Stearns Orchestra. In the words of one of the veteran dairymen present—"It was everything that could be desired."

THURSDAY MORNING.

BUSINESS MEETING.

Report of Committee on Resolutions:

Resolved, First—That we elect such representatives as this association is entitled to, to the Maine Federation of Agricultural Associations with instructions to give our active support and pay the necessary fees and expenses of the delegates;

Second—That this association favor some plan whereby the exhibits made by such associations as the Dairymen's Association, the Pomological Society, and the Seed Improvement Association be held during the same week and at the same place, dividing the time equitably for program purposes;

Third—That this association keep in touch with the movements now on foot to secure Federal aid in behalf of agriculture to be expended in each state for extension work under the direction of the agricultural colleges and give its active support to such bills as appear to best meet the needs of the state;

Fourth—That this association elect a visiting member to the Agricultural College; that the association pay the actual expenses of this member—he giving his time; that this member shall at the annual meeting of this association make a written report;

Fifth—That this association select a committee of three to take such measures as they think best for securing the appropriation made by the state for the premiums and expenses of holding this meeting;

Sixth—That this association extend their thanks to the newspapers of the state in giving publicity to this meeting, also for the special premiums offered by them and other companies; for the special rates given by the railroads; for the many courtesies extended by the Norway Board of Trade, Grange, and citizens of Norway; to all of whom the great success of this meeting is largely due.

F. S. ADAMS,
L. E. McINTIRE,
C. S. POPE.

Voted that a committee on nominations be appointed, and the chair appointed Charles R. Millett, of Minot; John M. Deering, of Saco; and William H. Davis, of Augusta.

This committee reported, placing in nomination the following persons:

President—L. E. McIntire.

Vice-President—H. G. Beyer, Jr.

Secretary—J. A. Ness.

Treasurer—R. Alden.

Trustee—J. D. McEdwards.

Delegates to the Maine Federation of Agricultural Associations—Charles R. Millett, W. W. Pike.

Visitor to the College of Agriculture—Frank S. Adams.

Member of Experiment Station Council—R. Alden.

The report was accepted.

Dr. J. A. Ness declined the nomination for the office of Secretary and placed in nomination Leon S. Merrill.

By vote of the association, Leon S. Merrill was authorized and instructed to cast the vote of the association for the persons placed in nomination.

The vote was cast and the President declared the following officers elected:

President—L. E. McIntire, East Waterford.

Vice-President—Henry G. Beyer, Jr., Portland.

Secretary—Leon S. Merrill, Orono.

Treasurer—R. Alden, Winthrop.

Trustee—J. D. McEdwards, Bangor.

Delegates to the Maine Federation of Agricultural Associations—Charles R. Millett, West Minot; W. W. Pike, Cornish.

Voted that a legislative committee be appointed to look after the interests of the association.

Voted that the legislative committee consist of Leslie E. McIntire, W. G. Hunton and Rutillus Alden.

On motion of Mr. John M. Deering it was voted that the Secretary be instructed to write Hon. Z. A. Gilbert of Greene, expressing the regrets of the association over his enforced absence at the annual meeting and the hope that the new year may bring to him a large share of comfort and happiness.

PREMIUM AWARDS.

CLASS I.

Dairy tub, ten pounds. 1st, H. B. Whipple, Bingham, 95 1-2; 2nd, Mrs. Alice J. Spofford, Greene, 95.

CLASS II.

Dairy prints, five pounds. 1st, J. A. Leach and sons, E. Eddington, 97; 2nd, Fernside Dairy, Norridgewock, 96 1-2; 3rd, Stephen Rose and sons, Greene, 96.

CLASS III.

Creamery tub, ten pounds. 1st, Turner Center Dairying Ass'n, Auburn, 96 1-2; 2nd, Skowhegan Jersey Creamery, Skowhegan, 96; 3rd, Solon Creamery Co., Norridgewock, 93.

CLASS IV.

Creamery prints, five pounds. 1st, Waterford Creamery So. Waterford, 98; 2nd, H. B. Hood and Sons, Winthrop, 96; 3rd, Carrabassett Creamery Co., E. New Portland, 95.

CLASS V.

Cheese exhibit, dairy, plain. 1st, F. L. Tibbetts, Ripley, 98; 2nd, Mrs. A. M. Dunham, Foxcroft, M. A. LeBaron, Lovell, 96.

CLASS VII.

Butter not winning in above classes and scoring 92 or over, Mrs. J. D. Cleaves, Yarmouth, 95 1-2; Mrs. H. Pingree, Otisfield, 95; Geo. L. Hilton, E. Waterford, 95; Geo. S. Smith, Monmouth, 94; The Pastures, Belfast, 94; Mrs. A. W. Whitehouse, Norway, 94; W. E. Leland, Mechanic Falls, 94; Erlon L. Brown, Norway, 93; E. E. McFarland, Palmyra, 93; Mrs. Woodbury Russell, Norway, 92; Mrs. C. C. Crowell, Corinna, 92.

CLASS IX.

Market milk, raw, 4 pint jars. John Pease, Cornish, 94; Mrs. C. C. Crowell, Corinna, 92; G. S. Smith, Monmouth, 93 3-4; Isaac Pingree, Oxford, 91; Benj. Tucker, Norway, 94 1-2; G. H. Dunn, Norway, 93 1-2; J. A. Ness, Auburn, 94 3-4; L. E. McIntire, East Waterford, 90 1-2; A. D. Cummings, South Paris, 91; A. L. Sanderson, South Waterford, 93 3-4; G. E. Freeman, Auburn, 94 1-2; Kents Hill Seminary, Kents Hill, 92 1-2; The Pastures, Belfast, 94 1-2.

CLASS X.

Market cream, raw, 4 pint jars. Mrs. C. C. Crowell, Corinna, 95 1-4; W. E. Leland, Mechanic Falls, 93 1-2; John Pease, Cornish, 93 3-4; Ira Harriman, Norway, 89 1-2; W. H. Plummer, Richmond, 91 1-2; U. G. Patten, Gardiner, 93; G. S. Smith, Monmouth, 95; Isaac Pingree, Oxford, 91; Benj. Tucker, Norway, 95; A. D. Cummings, South Paris, 93 1-2; A. L. Sanderson, South Waterford, 92 3-4; J. A. Ness, Auburn, 94 3-4; Kents Hill Seminary, Kents Hill, 92; The Pastures, Belfast, 95.

CLASS XI.

Market cream, pasteurized, 4 pint jars. Solon Creamery Company, Solon, 94; D. Whiting & Sons, Dexter, 94 1-2; D. Whiting & Sons, Belfast, 95 1-4; D. Whiting & Sons, Bucksport, 93 3-4; Skowhegan Jersey Creamery, Skowhegan, 93 1-2; H. P. Hood & Sons, Winthrop, 95 1-4; M. W. Hanson, Richmond, 94; T. M. Davis, South Paris, 89 1-2; Turner Center Dairying Association, Auburn, 95.

SPECIAL PREMIUMS.

VERMONT FARM MACHINE COMPANY SPECIAL.

For the sample of cream scoring 95 or above—separated exclusively by a United States Separator—a premium of $2.00, won by the Turner Center Dairying Association of Auburn.

For the highest scoring sample of market milk exhibited in Class IX., one year's subscription to the "Turf, Farm and Home," won by J. A. Ness of Auburn.

LEWISTON JOURNAL SPECIAL.

For the highest scoring sample of market cream exhibited in Class X., one year's subscription to "Lewiston Weekly Journal," won by Mrs. C. C. Crowell of Corinna.

For the highest scoring sample of dairy butter, six months' subscription to "Lewiston Weekly Journal," won by J. A. Leach & Son, East Eddington.

WORCESTER SALT COMPANY SPECIAL.

For the exhibit of butter scoring highest, if Worcester salt is used, a $25 gold watch, which was won by the Waterford Creamery Company, South Waterford.

MAINE FARMER SPECIAL.

For the second and third highest scores in the judging contest, one year's subscription to the "Maine Farmer," J. D. McEdwards, of Bangor; T. H. Johnson, of East New Portland.

EXHIBITS OF DAIRY MACHINERY AND APPLIANCES.

H. A. Flood representing the Creamery Package Manufacturing Company of Rutland, Vermont, exhibited a small silo.

E. E. Shepardson of Albany, N. H., exhibited a quantity of creamery apparatus and supplies.

N. D. Haskell of Mechanic Falls, agent for the Unadilla Silo, exhibited a silo 3′x6′, showing the door front with continuous ladder attachment.

B. C. Brett of the Vermont Farm Machine Company, Bellows Falls, Vermont, demonstrated the workings of three styles of cream separators.

G. D. Thorndike, state agent for the automatic cream separator, demonstrated these separators with two machines, one automatic, the other a hand machine, or the old way and the new way.

P. A. Crawford of New Bedford, Mass., was in attendance in the interests of the New England Farmers' Exchange which is issuing preferred stock.

The Ellis kerosene engine was demonstrated by James W. Carver of Danville.

The International Harvester Machine Company was represented by its local agent—E. E. Witt, who showed two cream separators, one of which was run by a small engine, the other by hand.

FUNDAMENTAL FACTORS IN DAIRYING.

B. H. RAWL, Chief Dairy Division, U. S. Dept. of Agriculture.

The lecture on the above subject by Mr. Rawl was one of the most inspiring addresses of the session and the Secretary regrets exceedingly that only an outline of the lecture is available. Mr. Rawl said in part—"You are not in dairying because of your health, at least you do not think you are but there are a good many dairymen who, if they do not get health out of it, are not getting anything. There are a great many herds which are not making expenses. This same thing applies to all kinds of farming. A great many farmers have gotten rich by losing money—by saving and working about twenty-five hours a day.

"There are a few fundamental principles of dairying. One of them is this—you have got to have a good herd of cattle, a herd that will produce an average of 300 pounds of butter fat. Any man who has not the figures which will show this does not have much of a herd, no matter what he thinks. Dairying,

from the time the farmer starts with products of the soil to the time of marketing the products, is an extremely complicated business. It takes all the ability that a man can bring.

"Another thing that we need is education. We have found out a great deal, but a great deal that we have found out is not being used. We know that 300 pounds are as easy to secure as anything else that is hard, but how many herds in Maine are producing 300 pounds? Why is the condition of dairying as it is? Because the average man refuses to utilize the information that it at hand. The cry of "Back to the farm" amounts to nothing. When the farm is a money making proposition there will be no trouble in getting people to go back to the farm; there will be no difficulty in getting people enough to raise the products necessary to feed the people. There is no more fascinating business in the world than dairying and breeding animals. Your whole effort is upwards. The drudgery of detail should be eliminated by interest. The weighing of milk would be of value if for no other purpose than this. The problem of help in the dairy will be partially solved by using the brains of men employed as well as their hands. Most men would rather use their brains than not do so. One of the reasons for failure among our farmers all over the country is that they do not utilize the brains of their workmen to the greatest extent possible."

BREEDING AS AN IMPORTANT FACTOR IN SUCCESSFUL DAIRYING.

HERBERT M. TUCKER.

In taking this subject, I wish to state, right here at the beginning, that I fully realize it is a large subject for a small man to handle. It is one that very few have any definite ideas upon, and fewer still have any definite knowledge. There are, to be sure, men who have made a study of breeding who will tell you just what per cent of the offspring will take after, or resemble, the sire and the dam, what per cent will resemble the grandsires and grandams, etc. I shall not attempt to discuss

this subject along these lines. But, as a man who has been with the cows all his life, I will say that in most cases it is very hard to select just the ancestor that a certain animal most resembles. In fact, it is frequently the case that an animal will resemble its dam in color, its sire in shape, and, perhaps, one of its grandams in dairy production. Thus, I find myself in deep water immediately if I start on this line, so I will drop it for some larger head to handle, and will simply call your attention to a few thoughts pertaining to the upbuilding of our dairy herds.

There are certain laws of heredity that are, or seem to be, past finding out. Men advance theories on the subject and seem to prove them beyond a reasonable doubt, only to have some other person prove the contrary with equally strong evidence.

Men have spent years in trying to formulate some rules of breeding, whereby we may surely and steadily improve our dairy stock from generation to generation, only to find themselves beaten in the end.

Men have spent large sums of money buying the best dairy animals money could buy and have gone forth with an "I'll show you how to do it" confidence, only to find in a few years that they had a nondescript herd, very few if any of which ever had equalled or ever would equal their dams.

It is a fact that by taking exceptional cases almost any theory can be proven. But you know it is only by conducting a series of experiments along a certain line under varying conditions that definite facts are reached.

It is a fact that any breeder who is earnestly striving to build up a dairy herd will find many discouragements. Perhaps, after several years of his best effort, he will find that he has been breeding down instead of up. Oftentimes he gives up in disgust and says, "It is all a lottery." But is it? Has there not been progress? Are our 1911 dairy cattle no better than those of a hundred years ago? Certainly there has been great improvement. The modern dairy cow is a creation not of God but of man, and she is going to keep right on improving to the end of time.

If the man who makes two blades of grass to grow where only one grew before is greater than he who conquers an em-

pire, how much greater is he who produces two quarts of milk or two pounds of butter where only one was produced before. Feeding enters into this, I admit; but back of feeding is the breeding. You must first have the cow that can and then it is up to the feeder to coax her to do it.

Conditions here in our beloved country are not ideal for best results in breeding. We have too many breeds, too many types and, last but not least, too many breeders without a definite purpose. The result is a general hodge podge of cross breeds and mongrels. A man will use a Jersey bull a few years; then an Ayrshire for another period; then, perhaps a Holstein, and so on. What can one expect from such breeding? And yet thousands of American farmers are doing this, or even worse, breeding to a mongrel or crossbred sire. Go visit the Ayrshires.

We Americans, although laughed at by other nations for being impetuous, headstrong and changeable, usually have one object to which all energy is bent. So in breeding dairy cattle, the object striven for, forgetting in most cases all else, has been production. I mean, of course, the real breeders that have had an object. Of course we have won out. There is no other country on the face of the earth that has bred so many world record cows. But when we think of the things that have been overlooked, such as type and constitution; when we think of the cows, great, wonderful, world-record cows, yes, whole families of cows, that have been ruined in this mad rush for supremacy of production, we can but wonder if the object gained has been worth the cost. I do not wish to be understood in this matter as being opposed to breeding for heavy producers, provided it is done in a sane manner, nor to feeding a cow liberally to prove her quality, provided it is done with such care and with such feed that it does not ruin the animal. But to feed her to her limit of endurance with concentrated feeds to produce the last ounce of butter she is capable of, until she breaks down under the strain, and ever after is of no value, either as a dairy animal or a breeder, is both cruel and wasteful. Yet such methods have been followed time after time and are still being followed by many leading breeders. Much might be said here regarding feeding, for in a way the two subjects are inseparable, but I will try to stick to the breeding side. I wish it

were in my power to give you a formula for successful breeding; I cannot do that. But I wish to call your attention to a few things that I think I have learned by experience and by keeping my eyes open to the experience of others. Then as you work out these problems for yourself, these ideas of mine may be of some assistance.

It is evident to any breeder of experience, that certain males will nick with certain females with good results. With a prepotent bull the per cent of good nicks will be large, while with a bull that is not prepotent the per cent will be very small. A bull may be backed by a line of great producing cows and the value placed upon him by his owner will be correspondingly high if this be the case, yet he may prove so lacking in prepotency as to be worthless, or even worse than worthless. To find out the reason for this and avoid backward steps, is to be a successful breeder. To be sure, there is but one positive and sure way, and that is by trial. Put a bull on probation. Use him sparingly until he has proved his ability to improve your herd. I cannot speak too strongly against the practice of buying a young bull and after using him two or three years, just at the time when his owner can begin to judge of his value as a breeder selling him to the butcher and buying another. Of course what we are trying to do is to pick out the prepotent bull, and this can not be done in this manner.

There are just two requirements a dairy cow must have before she can be reckoned in the list of great cows—a fixed and tenacious propensity for large production, and a constitution to carry out that propensity.

An animal to be a successful breeder must have the strength and stamina to carry out the dairy propensities that the pedigree shows were in the animal's ancestors. Both requirements must be present, and when either one of these qualities overbalances the other, the animal is not adjusted right and cannot be a successful breeder except in cases where the union is made with the opposite sex that happens to be overbalanced in the opposite direction, and even then the results are very uncertain. It is not to be wondered at, when one stops to think of it, that there is little stamina to transmit to a bull calf from the cow that had such a propensity for production that she had worn herself to a frazzle at the pail.

It is often the case that if the bull gets a large per cent of heavy producing daughters, his sons will prove very inferior breeders. This is why a bull is such an uncertain thing to bank on until he has been tried. He may be prepotent in getting nearly all good stock, both sons and daughters. He may get exceptionally good daughters and almost worthless sons, and he may prove worthless altogether.

An instance of this that came nearer home was in the herd of Father King. Some twenty years ago he bought a bull in Massachusetts that proved a very prepotent sire. I believe, in fact, he was one of the best Jersey sires ever owned in Maine. Nearly every heifer of his, even those from grade cows and cows of very ordinary breeding and dairy tendencies, were exceptionally good. Most of them made 14 pounds of butter a week; some as high as 20. I wish I knew more of this bull's pedigree and the conformation of his ancestors. His pedigree extended back into some good families at that time, but evidently they had not been pushed for heavy production, for there were no large butter records behind him. In father's herd at that time was a cow he thought a great deal of because she was an exceptionally good type and had a butter record of something like 17 pounds, and was a very persistent worker. This cow, Effie's Favorite by name, was bred to the above mentioned bull and a heifer calf was the result—a heifer that grew up to be several degrees better as a butter producer than her dam. Three years later the old cow dropped a bull calf by the same sire, and I urged father to keep him for his own use, believing that a bull out of so good a cow by a sire that was proving so prepotent would be sure to be a good one; especially so, since a full sister was proving such a phenomenal heifer. The bull calf was kept and he grew up a good-sized, healthy fellow, but he was effeminate. There was never any need of a staff to lead him. His disposition was like that of a cow. His conformation was like that of a cow, and if he had been a cow I have no doubt he would have made a good one, but as a sire he was a failure. His dairy tendencies overbalanced his stamina and masculinity, brought about probably by the continuous heavy production of his dam. His calves were of extreme dairy conformation but lacked vigor, capacity, were delicate feeders and poor producers. If this bull's sire had been bred on a cow

of the type of Sultana's Rosette, the result would probably have been very different. But even then I should prefer a bull whose sire was not as prepotent for the opposite sex as in the case just cited.

It is all right for a man if he has plenty of money and is inclined that way to try and breed world-record cows, but for the average dairyman and breeder who wants to improve step by step, the middle ground is safer. Breed for correct type and good production, but, above all, remember that the foundation for heavy production and satisfactory progeny is a strong, rugged, healthy animal. Keep this in mind and your chances of producing a world-record cow will be much greater than were you to spend thousands of dollars for a barn full of phenomenal producers and breed solely for production.

After studying Jersey pedigrees all my life, I think I can truly say that four-fifths of the heavy, long distance cows that have made the Jerseys so famous as butter cows have been bred by the small, humble breeder, and very often have not been the direct offspring of heavy producers. Jacoba's Irene, the Jersey cow that holds the world's record of all breeds for a two-year-old authenticated test, is a brilliant example of this. Loretta D., another Jersey cow that headed all breeds in the economical production of butter-fat at the World's Fair dairy test at St. Louis, is another example.

In regard to line-breeding and in-breeding, that, too, depends entirely on the strength and stamina of the animals as to whether it can be followed with good results. I used to believe that in-breeding was harmful, in that it so weakened the progeny that in a very short time any strain or family so bred would be entirely ruined. It is true that characteristics of a family may be intensified by in-breeding, and I fully believe that with careful selection of strong animals of the same or nearly the same blood, the strength and stamina can be intensified as well as other points. I would not hesitate to in-breed so long as the vigor of the offspring was not impaired and no undesirable points appeared. But generally speaking, I do not recommend in-breeding to any great extent, for it must be done with great care. Bad qualities are likely to appear, and when they do, in-breeding will intensify them very rapidly.

Line-breeding is much safer and is to be recommended at all times when you know that certain blood lines are nicking well together.

In closing, I wish to leave this one thought that I have tried to carry all through this paper, and that is that the strength and vigor of our dairy animals is the only foundation we can safely build upon for improvement. Disease, overproduction, too much high concentrated feed, as well as a lack of proper food, in fact anything that reduces the vitality of our dairy cattle will surely show itself in after generations. Many things are yet a mystery to us in breeding, and from lack of knowledge we have to work out some problems backward, taking the answer first, then tracing out the reason. But if we keep the health and vigor of our breeding animals in the foreground and then plug away at the other questions as they arise, there will be little danger of breeding very far wrong.

THE DEVELOPMENT OF THE DAIRY COW.

By P. A. CAMPBELL.

During the first few days that may elapse before the fertilized ovum becomes attached to the uterus, it is fed by the food materials carried by the germ cell. From the time of its attachment, the nourishment comes from the dam's circulation; the only influence that the dam now has comes entirely from the blood, and then not by direct circulation but only in the form of nutrition.

The nervous system of the cow is not as well understood as we wish it might be. Anything that will affect the blood of the dam will affect the growing fetus satisfactorily or adversely. With the heifer that has never milked, the growth must be maintained; with the milch cow, aside from food for maintenance, enough nutrients are required for the milk production. The embryo or fetus at the end of the third month is about 5 1-2 inches long; by the end of the fourth month it is about 10 inches long and weighs between four and five pounds. Up to

this time it has not been sufficiently large or its demands sufficiently great to prevent the heifer or milking cow from making a normal growth or doing the work required. During the fifth month the fetus increases materially in length and weight, but at the beginning of the sixth it can be seen that if the calf is to weigh 75 pounds at birth, there is something like 65 pounds of weight to be gained in the last four months, or at least a gain of half a pound per day. This alone would indicate to you the necessity of feeding the heifer well at this time if neither the heifer nor the fetus are to suffer. Our milk records show that even the heaviest milkers usually begin to slack off about this time. The cow that has been milking also has another duty to perform for herself; during the earlier lactation period she gradually but continuously has torn down the body tissue in order that she might use it towards production. If then she is going to put herself in condition so that she can go through the same work after calving out, it will be necessary to feed her so that she will put herself in condition. We must continually remember that there are two bodies to support, and that the food should not be cut down too severely when the cow goes dry, but that she should be given enough so that the fetus may make its natural growth and that the cow may be ready to do a full period of lactation work.

In going over some of our records, we find that the cow that has gone dry, while perhaps not requiring the same amount of food nutrients that she required when milking heavily, still uses an amount far in excess of what would be required simply for her maintenance. The birth of the calf changes its form of existence. Whereas, before it was getting its food in a form all ready for building tissue, now it has to digest and assimilate it for itself. The cow, however, assists for a time by supplying an easily digested and easily handled food for the calf, and if we take this milk which nature intended for the calf, we must give the calf an equal allowance of food nutrients, either in the form of milk or some other form, to take the place of that which it would naturally get from its mother.

During the fetal life the calf has been gradually accumulating in the alimentary tract the general waste of the body. In order to free this, nature has provided a natural purgative in the form of colostrum. Sometimes the calf is unable to have this

colostrum, depending to a certain degree upon the physical condition of the animal. If for any reason this first milk is not available for the young calf, due to the fact that the cow may have been milked regularly up to the time of calving, or milked previous to calving as the result of an abnormal condition of the udder, then some form of physic should be given the calf. Castor oil is usually employed.

The young dairy calf learns to drink readily, and as soon as it is evident that the colostrum has been effective, it is just as well for the cow and calf to be separated, for the results in working the cow to a full production are better, and the calf gets along just as well. It must be remembered, however, that this method of handling the calf is in part unnatural, and that greater precaution must be observed if no setback is to be experienced. One of the greatest troubles is over-feeding at this time. It is also necessary that the temperature of the milk be at about blood heat, or but a degree or so below, and that the calves be fed from clean pails. Some feeders use but little new milk in starting the calf, while others use it for a long time. In our experience the best results have been obtained where the calf was allowed whole milk at least ten days or two weeks. Calves that are fed whole milk during the earlier part of their life, or are allowed to suckle the dam, make a rapid growth for a time and seem to be ahead of their less fortunate sisters that have to subsist upon skim-milk and rougher feeds; but it has been demonstrated time and time again that they make no better cows or excel in growth. When the whole milk is stopped, it takes them some time to become accustomed to the change, and before they have become accustomed to the change, the others have caught up with them.

If possible, I believe that it is desirable to give the calves more of a chance to rough it than we usually do. Some of the breeders are now growing their calves where they can run out and in at will after the first few weeks of their life.

It has been quite definitely proven that a calf well fed from birth reaches sexual maturity on the average earlier than those scantily fed; however, even under those conditions it varies considerably. The breed also influences it somewhat. It is safe to say, however, that no heifer should be bred to freshen before two years of age. During the last three months of preg-

nancy the heifer does well to maintain herself and nourish the growing fetus, without making any perceptible gain. Consequently, it must be figured that the heifer must be of about the size that you wish to bring her into at least three months before parturition. It is possible with the larger breeds to have them of sufficient size to calve at least by the time they are thirty months of age.

The way the heifer or dry cow is handled the last two or three months before parturition has much to do with the production after calving. It is evident that the vast majority of the cows in this state are not working up to the point of production that their natural inheritance would permit. The cause of this may be in several directions. In some cases they are not fed a sufficient amount above maintenance; in other cases they are not fed the right proportion; and in many cases the milking function is not incited sufficiently at parturition time. Or in other words, the heifer, or dry cow, not being in the producing list, is too frequently given too little thought and care.

With the heifer the milk glands have not been developed; in the dry cow they are dormant. Approaching parturition brings them into activity and growth. The development of these is going to determine to a large degree the production for the next lactation period. If your cow is not well bagged at the time of calving you cannot expect the best work from her. Although you can help a little sometimes, no amount of feeding is going to put it where it ought to have been. Consequently the cow that has not been dry for two months or so, or is not in good condition at calving time, is hindered for a full year's work.

The herdsman's duty does not all end here. Some will say that there is more danger from caked udder, milk fever, and other troubles; and such is true. But feeding the cows succulent and cooling feeds will tend to prevent this, and milk fever is not to be feared with the present method of handling it. After calving, the cow should be brought to her full flow as soon as it can be done without injury to her.

Here the daily milk records will assist and guide the feeder. Care should be exercised to feed the cow to the point of economical production, and in so doing the feeder will exhibit the utmost skill. Very few cows will respond sufficiently to the

point where they are likely to be over-fed when the products are sold at a normal price. To keep the cow working steadily is the next consideration. A shortened food supply and the lessened needs of the offspring formerly were incentives for the milk flow to slacken and finally stop. With a plenteous food supply and common sense, there would seem to be no physiological reason why the production should not keep up until the next fetus becomes of sufficient size to turn the food nutrients from the channels of milk production to those of its own development.

It may be easy to say how to develop the dairy cow, how she should be bred, and how she should be fed, but it finally resolves itself into a thorough study of the principles of both breeding and feeding, combined with common sense and actual experience of the man that is handling the herd.

Pedigree is nothing more nor less than a family tree. We do not usually think of the grade animal or one of mixed breeding as having a pedigree, but in reality they actually have one the same as the pure-bred animal; but it is usually difficult to trace it, due to the fact that no records have been kept of it. It is also one that is more likely to give the breeder greater difficulty, due to the fact that there are so many alien characters belonging to it. Some breeders say that pedigree is of little value, while other breeders sit at their desks and make up their matings without regard to the general type, ability, or other characteristics of the animal. Both of these classes of breeders usually are unsuccessful.

A happy combination of both pedigree and selection of the animal is what is needed by the breeder, and the more he can know about the animal, the more rapid will be his progress.

In breeding the dairy cow, not only should her general conformation be considered, but her capacity as an economical producer and as a breeder should be considered. A high producing cow that is the progeny of two only average animals scarcely ever reproduces herself; she is simply a fortunate nick in the line of breeding, and while both parents undoubtedly preserved in a dormant form this high production characteristic, they also contained the low production to a considerably greater degree, so that the cow when she fails to produce progeny as good as herself is only transmitting those qualities which she

has naturally inherited, and her possibility of producing an animal as good as herself lies only in being mated with an animal which is superior to her, due to the fact that he contains in his blood to a considerable degree the high production characteristics, and it is consequently seen that the more animals we have of high producing quality in the pedigree, the less likelihood we have of bringing together two low producing characters and getting as a result an animal of low production. This in a way explains the advantage of grading, or using pure-bred sires continually in the herd. The sire having been bred pure for generations possesses to a considerable degree the higher possibilities of production, and when mated with an animal of mixed breeding that has no potent characteristics in particular, his opportunity of exerting influence is considerably increased.

In the regular practice of breeding it is generally conceded that the influence of the parents in heredity is 50 per cent, thus giving to each parent 25 per cent; of the grandparents, 25 per cent, thus giving to each grandparent 6.25 per cent; of the great-grandparents 12.5 per cent, and so on down the line. Thus it is seen that the relative value of the nearby ancestry and the influence of remote ancestry unless intensified by appearing several times in the pedigree, as it frequently does in some of our different families of dairy cows, is only valuable according to its nearness to the animal in question. Thus we can see that an animal that is removed six or eight generations from the animal considered has but small influence upon the ability of the animal in question; yet I would not discourage for a moment anyone from tracing back the pedigree of his animals and getting as strong a foundation as possible. What I would emphasize, however, is that although he can trace back to renowned individuals, it is fully as necessary that nearby ancestry be given careful consideration. This would seem to indicate, then, to us that if we select animals for foundation stock, that we know to be producers, and whose parents and grandparents on both sides were producers, our chance of getting good producing animals is considerably increased. We should also recognize the fact that the sire's opportunity is far greater than that of the female, and that if he is producing daughters that are desirable producers, or is producing sons that are producing daughters, it is a good line to tie to, and we can feel that we

are coming nearer to that line of breeding from which a part, at least, of the low production has been expelled. While we are considering production, however, it is necessary that we should take all of the other characteristics into consideration because in time, although we have attained to that height in production, we may have lost sight of some of the characters which go to give them the desirability which they should possess. We must not lose sight of the general stamina and constitution of the animals or their ability as breeders; though we may have attained to that height of production to which we anticipated, if we have lost in so doing the ability of the animals to breed it means but little to us if we cannot reproduce them again.

The matter of heredity undoubtedly follows definite laws, but unfortunately we are unable to control it to the degree that we would like to, and it is not as well understood by the practical breeder as it should be. For this, however, it is enough to say that the fertilized ovum contains all the future possibilities of the animal which is to be developed from it. If undesirable characters are present in the parents, they stand a chance of being transmitted to the offspring, and until we can eliminate these undesirable characters from the blood—although they may remain in a dormant form most of the time—we are bound to more or less reversion.

The Committee on Breeding Experiments in connection with the Agricultural Experiment Station reported progress.

The report was accepted and Dr. Raymond Pearl added to the Committee.

Voted to adjourn Sine Die.

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Adams, F. S.,	Bowdoinham	Light, E. E.,	Union
Alden, R.,	Winthrop	Longley, P. S.,	Solon
Allen, W. H.,	Buckfield	Harriman, Ira,	Norway
Anderson, S. B.,	Gorham, R. 4.	McEdwards, J. D.,	Bangor
Bachelder, C. H.,	Dexter	McIntire, C. S.,	E. Waterford
Bagley, F. H.,	Troy	McIntire, L. E.,	E. Waterford
Bailey, B. A.,	Wiscasset	McKenney, J. E.,	Wiscasset

LIST OF MEMBERS—Concluded.

Bateman, L. C., Lewiston
Beyer, H. G., Jr., Portland
Bickmore, E. D., Stockton Springs
Black, E. E., West Baldwin
Blanchard, F. W. & Sons, Cumberland Center
Bradford, E. L., Auburn
Bradford, T. B., Golden Ridge
Brett, B. C., Auburn
Bridgham, G. F., Auburn
Buckley, J. P., Stroudwater
Burnell, Dexter, Cumberland Ctr.
Campbell, P. A., Orono
Canham, V. W., Lewiston
Carll, E. C., Augusta
Cleaves, J. D., Yarmouth
Corinth Creamery Ass'n, E. Corinth
Davis, W. H., Augusta
Deering, J. M., Saco
Doe, C. H. & Son, Fairfield Ctr.
Dow, E. C., Belfast
Dow, F. N., Portland
Dunn, G. H., Norway
Dunn, V. E., Norway
Evans, H. W., N. Brighton
Evans, S. G., Waldo
Fisher, C. C., Hudson
Foster, D. E., Augusta
Fuller, C. H., Norridgewock
Garland, L. E., E. Auburn
Gilman, A. W., Foxcroft
Guptill, A. J., Berwick
Guptill, C. A., Berwick
Hamlin, C. P., E. Wilton
Hamlin, C. S., Harrison
Hamlin, W. K., S. Waterford
Hanson, W. M., Richmond
Harris, E. E., Skowhegan
Haskell, F. L., S. Windham
Heath, N. L., W. Penobscot
Holbrook, E. K., Mechanic Falls
Home Dairy Co., Portland
Hood, H. P. & Sons, Winthrop
Howes, A. P., Palmyra
Hunton, W. G., Readfield
Jewett, B. D., Whitefield
Jewett, E. C., Whitefield
Johnson, J. L., Harmony
Johnson, T. H., E. New Portland
Jones, C. L., Corinna
Jones, O. L., Corinna
Jones, R. O., Winslow
Leach, J. A. & Son, E. Eddington
Leland, F. W., E. Sangerville
Leland, W. E. & Son, Mechanic Falls
Lemont, J. M. & J. P., W. Bath
Libby, Frank, Richmond
Marshall, L. O., Topsham
Merrill, H. H., Hebron
Millett, C. R., W. Minot
Mitchell, R. P., Freedom
Moore, J. H., Winthrop
Moulton, D. E., Portland
Morse, F. H., Waterford
Moulton, H. M., Cumberland Ctr.
Moody, C. H., Auburn
Ness, J. A., Auburn
Patten, R. T., Skowhegan
Pearl, R., Orono
Perkins, S. W., W. Kennebunk
Pierce, I. C., Bingham
Pike, C. L., Lubec
Pike, W. W., Cornish
Plummer, A. L., Benton
Plummer, W. H., Richmond
Pope, C. S., Manchester
Pope, E. C., Manchester
Porter, I. J., Houlton
Purcell, C. W., Biddeford
Redman, R. W., Orono
Ricker, R. A. & Son, Turner
Rose, S. W., Greene
Ryder, H. F., Auburn
Sanderson, A. L., S. Waterford
Smith, G. S., Monmouth
Smith, R. L., Kennebunkport
Smith, Owen, Portland
Smith, H. A., Litchfield
Sparkling Spring Creamery, Norridgewock
Spofford, Mrs. A. J., Greene
Spring, C. E., Brownfield
Shaw, H. H., Portland
Stetson, W. C. & Son, Waterville, R. 40
Sweetser, H. P., Cumberland Ctr.
Symes, E. E., Winthrop
Rines, J. H., Portland
Thompson & Leland, Dover, R. D.
Tilton, A. F., Auburn
Tripp, C. E., Ripley
True, J. W., New Gloucester
Tucker, Benj., Norway
Tucker, H. M., Canton
Twitchell, B. F., Fairfield Ctr.
Warren Creamery, So. Warren
Wheeler, Chester, Hiram
Whipple, H. B., Bingham
Whiting, D. & Sons, Bucksport
Whiting, D. & Sons, Pittsfield
Winslow, J. M., Nobleboro
Withee, Everett, Augusta
Woods, C. D., Orono
Worcester, W. S., Hallowell
Young, R. I., Skowhegan

REPORT OF PROCEEDINGS

OF THE

State Dairy Conference

AND

FIFTEENTH ANNUAL MEETING

OF THE

Maine Dairymen's Association

DECEMBER 3, 4, 5, AND 6, 1912.

The annual State Dairy Conference was held in City Hall, Portland, December 3rd to 6th, inclusive. The exhibit of dairy products, and dairy and farm machinery constituted the largest and most attractive display made at any dairy conference during the past decade. The meetings were interesting and well attended.

The annual meeting of the Maine Seed Improvement Association was held in conjunction with the dairy conference and added much of interest to the program. An excellent exhibit of corn, small grains, beans, potatoes, etc., was made by this association.

TUESDAY EVENING, DECEMBER 3.

The meeting was opened at 7.30 o'clock by Mr. Charles F. Flagg, President Portland Board of Trade. Invocation was offered by Rev. Joseph Battle Shepherd.

Addresses of Welcome were delivered by representatives of the City, the Board of Trade, and the Portland Farmers' Club. Hon. John B. Kehoe, speaking for Mayor Curtis, gave a cordial welcome to the dairy and seed men in behalf of the city, and expressed his gratification that the days of the slipshod farmer were over, and that matters of agriculture were being given scientific attention.

Mr. Silas B. Adams, speaking for the Board of Trade, assured the convention of the hearty spirit of coöperation existing between the body which he represented and the two which were holding their conference in Portland. "The Board of Trade realize that agriculture is the basic industry of the state and members are anxious to have a share in its promotion."

Col. Fred N. Dow spoke for the Portland Farmers' Club. The keynote of his brief address was loyalty to the state of Maine and devotion to its welfare.*

At this point the meeting was turned over to Mr. W. G. Hunton, President of the Maine Seed Improvement Association, who introduced Dr. Leon S. Merrill to respond for the two Associations.

RESPONSE TO ADDRESSES OF WELCOME.

By LEON S. MERRILL.

Your words of welcome are warmly appreciated, because knowing you and the splendid citizenship you represent, we know that you are indeed glad to have the Maine Dairymen's

* NOTE.—The Secretary regrets that the addresses of welcome cannot be reproduced in this report. They were especially happy in their expression.

and the Maine Seed Improvement Associations meet in your city. In turn, we are equally glad that circumstances have so directed the affairs of our associations that their annual meetings can be held in the city of Portland.

We are glad, because Portland is a beautiful city, because it is the chief city of this great commonwealth, because its citizens are public spirited, because of its strong and aggressive business organizations, because these organizations have shown an active interest in the development of agriculture, and because many of the members of the Portland Board of Trade and the Portland Farmers' Club are active members of the associations which are tonight and will be for a few days, your guests.

These associations represent organized agriculture along two fundamental lines of the industry, plant and dairy husbandry. It is from these two lines that Maine agriculture derives its principal income, amounting to quite fifty million dollars annually.

The Maine Dairymen's Association was organized to fill a definite need in the dairy industry. It has helped to educate and unify its membership; to improve the quality of dairy products; to place the industry on a firmer business basis. It has labored under difficulties and its efforts have been practically limited to holding an annual meeting and exhibition, simply because no direct appropriations have been made by the state for its support.

Its plans for the future must include liberal support from the state and an aggressive promotion program. As business men we must recognize the fact that it costs money to do things worth while.

The dairy farmer produces a product which constitutes not only one of the greatest necessities but also one of the greatest luxuries among human foods. As a people we are growing more fastidious in relation to our food. While the dairy industry of the state has had a slow but steady growth, the farmer has for some time been feeling the pressure of the growing fastidiousness among the people. He has also been feeling pressure from higher priced cattle feeds; from scarcity and inefficiency of farm help.

Shall the products of the dairy continue to fill an important place in the living of the people? If so, then dairy farming must be encouraged. The quality of dairy products, it is true, must be improved but at the same time the consuming public must be educated both to care for such products in the home and to have a proper appreciation of their value as articles of food. It is our part to improve the quality; it is your part to educate the people who are consumers. Let us work together.

The Maine Seed Improvement Association centers its activities around a big idea, "increased seed efficiency." Efficiency is a crying need in all industries, whether we deal in terms of men, machines, plants, or animals. Efficiency in seeds makes success in plant husbandry surer. It adds its contribution to harder working acres, to increased food supply, to profitable agriculture. It helps to erect standards and then aids to surpass them.

In its efforts the association represents high ideals and deserves the support of the state it is trying to serve. The membership of our associations includes leading farmers of the state. These men are interested in Maine and the development of her agricultural resources. We are here to counsel together for the advancement of Maine's greatest industry. Successful agriculture means happy and prosperous farm homes; it means the maintenance of high ideals among American farmers; it means stability in business—in your business; it means national welfare and progress.

In conclusion we thank you most heartily for your cordial welcome; and assure you we are happy to be with you and enjoy your hospitality.

The principal address was made by Hon. Payson Smith, state superintendent of schools, who spoke on the attitude of his department toward industrial education. Supt. Smith said, in part:

INDUSTRIAL EDUCATION.

What then should be the attitude of the Maine school system towards those practical phases of education that are included in what we call industrial education?

Common Schools Furnish Foundation.

It goes without saying that the primary purpose of the common schools is not to fit children for specific vocations. The elementary schools, dealing with children up to the fourteenth or fifteenth year should place their strongest emphasis on the teaching of those fundamental subjects that form a basis of other education. The historic subjects of the common schools should continue to be the vital elements around which the instruction of these schools should center.

School Subjects Vitalized.

These subjects need, however, to be taught in a more direct connection with the affairs of the real world in which the child daily lives. The instruction given in school should not be detached from the realities but should deal with them. Arithmetical problems should be of the kind that the boy will have occasion to use outside of school. Geography should deal more with facts nearer the child and less with those remote from him. History should be more than a recital of events. It should become, so far as good teaching can make it, a guide to good citizenship. All subjects taught in the common schools are not parts of that which we generally term industrial education, but all of them may be so taught as to lead the child into a better realization of his own powers, into a clearer vision of the demands the world will make of him, and to that extent they make for a more effective contact of the individual with society. Hence they do have a bearing in increasing the efficiency of each social unit.

More Hand Work.

There is place, however, in the lower schools for a vast increase of the attention paid to those forms of education that involve hand training. It has been demonstrated again and again that the process of education is often more effectively conducted by means of an appeal to the motor activities than in other ways. We learn by doing as well as by thinking. The schools ought to be given very much greater opportunity than they now have to apply in action the education that is so largely

limited to a study of theory. Hand work in the form of manual training for boys and domestic subjects for girls ought to extend very rapidly into all elementary schools and very much more time should be given to them.

Theory Should be Applied.

I have no doubt that pupils would be more efficiently educated if half the day were to be devoted to an application in practice to the theories studied. Some communities will soon have the courage to place the work of their elementary schools on some such basis. Indeed at Gary, Indiana, the school course is already organized somewhat on that plan with great economy in money cost and with an apparently considerable educational gain. Maine has a most liberal law for the encouragement of manual work in elementary schools. There remains only the necessity of an aroused public opinion in the several towns in favor of adequate attention to courses of this kind.

What Secondary Schools Can Do.

A peculiar opportunity is open to Maine high schools and academies in the direction of a more vital connection between school and life. The youth who attend these schools are, many of them, just about to pass into some active contact with industry. Such schools will and should pay very large attention to these courses that make for culture—for the ability to enjoy the finer things their lives will present to them. They will render a very sorry service, however, if they leave their graduates with only the taste to enjoy and without a liking and desire for work. It is a dangerous thing to educate a person in such a way that he wants fine things unless it leads him to see those things in their true values and right relations and unless he becomes able to get honestly the things his taste leads him to desire or to need.

Should Help Student to Face Life.

Maine's secondary schools in both country and city should pay increasing attention to the problems that are so soon to press upon their young students. The individual and society will suffer unless these young men and women are led through

their education to realize that its goal is service and unless to some extent they get a realization of the ways in which they are best adapted to serve.

Agriculture in Rural High Schools.

Rural high schools should pay greater attention to agriculture in all its forms. This attention may come in many cases through subjects now offered. Chemistry, for example, is being removed from the field of the abstract and is being made specifically to apply to soil study, food values and other specific ends. Chemistry is not less valuable but is more valuable when given this concrete application. The comparison may be made of many of the already accepted subjects of the secondary schools. There are schools that should go beyond this, however. Some that have proper equipment and adequate public sentiment as a support should frankly enter the ranks of special vocational schools making the agricultural course a central and controlling purpose of the institution. A few schools, such as Parsonsfield Seminary, are already doing this and from being schools of somewhat uncertain mission are becoming strong and virile with the new purpose. Maine ought to have at least twenty schools that should frankly and avowedly undertake seriously agricultural courses. With the large number of secondary schools in Maine it would appear to be unnecessary and unfortunate to increase the number of institutions. Some of these we already have are admirably situated for the purpose.

City High Schools.

In the cities the opportunities for a closer contact of school and industry are not less evident. The so-called Fitchburg plan, which has passed out of the experimental stage, has shown conclusively that schools and shops may coöperate in giving the boy an education that preserves for him the education of the schools while it adds the practical value of shop application. Outworn traditions must yield to successful evidence of the kind produced at Fitchburg. The high schools of all our large towns and cities will, I believe, in the near future pay greatly increased attention to a study of local industries and the opportunities offered by them. Through extended manual courses,

in some cases related to the trades, and through coöperative courses they will open new avenues of approach by which young men may enter employment with right ideals of labor's significance and with such practical equipment as will lead them to more satisfactory returns for their labor. At the same time the young women will be better prepared for all the fields that may appeal to them, not forgetting the chief of them all, that of home making.

Does Not Ignore College Preparation.

These changes in our secondary schools are not inimical to such higher education as the colleges now offer. They merely indicate that the boy who will not go to college has his rights which the school must recognize, on at least an equality of plane with those for whom the secondary school course is college preparatory. The public school is indeed for all the children of all the people and upon any other basis it loses its claim to the support of all the people.

Continuation Schools.

In addition to the things that should render our ordinary schools more effective there is vast opportunity for increasing the industrial capacity of the people through courses that will enable those already engaged in the industries to increase their capacity in them, or to change from one to another.

To discover how general is the desire for such opportunities it is not necessary to turn to the enormously successful public continuation schools of Europe. We find evidence in the hundreds of thousands in our country who at personal expense undertake the so-called correspondence courses. For the present the continuation courses in Maine are likely to be largely in connection with evening schools.

Short Courses Recommended.

The short evening school course making a direct appeal to some specific need of the student is capable of immediate development. For example, an evening course of a few weeks in the reading of blue prints would be valuable in any community where there are a number of machine shops; a short course in

the principles of salesmanship would be distinctly valuable in at least a dozen of our cities; the domestic science equipment ought not to be idle when by means of a short evening course it could be employed for the advantage of those whose interest is in the betterment of household and domestic service. The manual training equipment could similarly go to assist young men just entering certain occupations. Short courses in bookkeeping and stenography would increase the interest and earnig capacity of those already engaged in such work. These are but examples of the ways in which short courses may be made valuable. You have only to visit an evening school where such courses are offered to realize how direct an appeal is made as soon as the student can connect his evening study with the next day's task.

Continuation Day Schools Will Come Later.

Doubtless the continuation day school will soon be possible in Maine. Its coming will depend in part upon the coöperation of employers of labor. In some European countries the employee is entitled by law to attend a continuation school for a certain specified time. Thus the nation aims to protect its industrial efficiency. A few continuation day schools in America are already successful in large communities where employers realize the advantage of such means of increasing the capacity of their workmen.

The Vocational School.

There remains the independent vocational school of which we have thus far none in Maine, although our state law provides for its liberal aid by the state when any community is prepared to establish one. The distinct trade school usually takes boys and girls at the end of the elementary school course at the age of fourteen or fifteen and gives them the training of the elements of a chosen trade. Only the largest cities would be likely at present to provide a patronage large enough to warrant the establishment of such a school. It is hoped, however, that at least one or two such schools may be started to provide for some of the youths who now pass directly from the common school into industry to their own ultimate loss and to the depreciation of the service of the industry they enter.

Involves Experiment.

We do not see our way to the end of our industrial education plans. It is not necessary to do so in order to undertake these things that now appear right and just. Experiments are involved and some are likely to be made. I am not disturbed however, either by the charge of experimentation in the schools or by the possibility of mistakes. All of our educational progress, as well as other progress, is the result chiefly of experiment. Without it we should be at the beginning of time. The unchartered course may be less easy to follow, but it leads to the undiscovered continent of new achievement. And if we are to hold still our plans for educational betterment until the danger of mistakes has passed, then there is little hope for that growth of which we have believed public education to be the best guarantee.

Maine faces a future of brightest industrial prospect. No other state surpasses ours in the possibilities of the economic improvement of her people. But let us remember that Maine's future is in her children. As they are being educated with respect to personal rectitude, to civic responsibility and to useful service so will the Maine of the future realize the potential prosperity we believe is hers. It is our present obligation in our school system, as in all other institutions to point our youth to all possible ways of self realization and social service, at the same time swinging wide as we can the doors of their opportunities.

At the close of the addresses a fine organ program was given by Organist Will C. Macfarlane in the auditorium of the City hall.

WEDNESDAY, DECEMBER 4.

ANNUAL ADDRESS OF THE PRESIDENT,

By Leslie E. McIntire.

The meeting of the Maine Dairymen's Association today in this, your beautiful City of Portland, reminds me of a great

ship that has made a long rough voyage, that has encountered heavy gales and high seas, been buffeted and tossed about by the winds and waves, but has at last reached a safe harbor.

Your city is noted the world over for its fine harbor and your citizens for their hospitality. The members of the Maine Dairymen's Association are pleased to accept your invitation to hold their annual conference and exhibit in your city, and to share your hospitality.

As dairymen we hope this meeting will be of mutual benefit to the consumer of dairy products as well as the producer. The two words that mean so much to progress today are "*get together.*"

Perhaps it is not out of place at this time to say a few words to the members and friends of the association in regard to the work done by the association the past year, or in other words the lack of work done by the association the past year. It can be said in a very few words. The fact is this: we have had to use our time and money in a struggle to live. We have been reported dead. Even the Commissioner of Agriculture believed it and informed us he had organized another association to take our place.

Now, without assistance and without funds from the state, you can readily see why there has been no more work done the past year. But I want to say to the members and friends of the association that the Maine Dairymen's Association is alive, and very much alive too. Its members and friends all over the state are alive to the possibilities that the state offers for dairying. The members also are alive to the fact that if it had not been for a few men in the state who had the foresight to see that the dairy business of the state must be placed on a solid foundation, this foundation to be laid upon business principles, system, and better methods, the dairy industry would not be so well established today. It was the work begun by those men, which calls the Maine Dairymen's Association together today. One great step in making dairying profitable has been brought about through the cow test association work. That work soon demonstrated the fact that most dairymen have some profitable cows, some that barely pay their keep, and some that actually lose money. Most men

after learning the condition of their herd, I am glad to state, began at once to lay a better foundation. This created a great demand for profitable cows.

The next step was the organization of breeders' associations representing the leading dairy breeds of the state. The dairymen and breeders of the state have received great help from the College of Agriculture of the University of Maine in promoting and advancing the dairy interests and the breeding of better dairy stock. In fact, the extension work that is being done by the College of Agriculture is bound to be of great and lasting good to all branches of agriculture in the state.

There is one thing we must remember, that the breeding and growing up of a profitable dairy herd is a long, slow process with a great many disappointments, but it can be done, as is being demonstrated all over the state. In order to be successful we must put the best there is in our make-up into the work and keep at it. There is no business that will manage itself. What effect does the breeding of better dairy stock, the use of finer system, the best known methods and care in handling the product, have on the consumer? The ordinary herd is not a profitable one and as that class comprises a large part of the herds of the state, the cry has been that dairying does not pay, that we must get a higher price for our dairy products.

The study of a manufacturer is how to produce the largest amount at the least possible cost. The dairyman is a manufacturer, the cow a machine, and the feed the raw material to be converted into a finished product. Now, the cow that from a stated amount of feed, can produce milk or butter fat at the least cost, is the one that all breeders are trying to produce, and that all dairymen should have in order to make dairying profitable. The question of the producer and the consumer is not a one-sided one; the rights of both must be respected and protected. It is not fair to ask the consumer to pay a price for our dairy products that would make up for poor cows, for lack of business principles and methods, for lack of attention to every detail connected with manufacturing the product. Now, on the other hand, the observation and experience of any fair minded producer of dairy products is that the consumer is willing to pay a price that will warrant a fair profit on goods bearing the stamp of purity and merit.

When the dairymen of Maine put the same amount of work, study and energy into their business that other lines of business demand to make them successful, then the cry that dairying does not pay will be silenced, and the state will not only be willing but glad to render such aid and assistance as may be needed to promote and advance the dairy interests of the state.

Now as dairymen, let us go home with the determination to so conduct our business, and by consulting the wants and needs of the consumer, build up a business that is not only profitable to ourselves but a credit to the state.

REPORT OF SECRETARY.

To the members of the Maine Dairymen's Association:

During the past year, three meetings of the executive committee were held but as full reports of these meetings will be read no further reference will here be made.

FINANCIAL REPORT.

Received from membership dues		$43 00
CREDIT.		
Paid accounts as follows:		
W. T. Smith, engraving cup	$2 00	
Norway Advertiser, printing tickets	4 00	
Bangor Coöperative Printing Co., printing entry blanks, etc.	10 50	
Dues Federation Agricultural Association	4 00	
	$20 50	
Balance paid Treasurer	22 50	
	$43 00	$43 00

The secretary desires to bring to the attention of the association certain business transacted at the last annual meeting which will necessarily come up again during the present meeting.

Resolved, First—that the committee on barns be continued as a legislative committee on barns at the State University and that the Maine Live Stock Breeders' Association be requested to continue a special committee on barns for a similar purpose.

The Maine Live Stock Breeders' Association at its recent meeting endorsed the movement in the following resolution:

Resolved: that we recognize the great need of new barns at the University of Maine, and that this association shall continue to use its influence to obtain them.

Second: A resolution was passed advocating the union of associations in the holding of exhibits and acting in accord with this resolution the executive committee arranged with the Maine Seed Improvement Association to hold joint meetings and exhibits.

Third: The association voted to give its support to the movement to secure aid from the national government for the support of extension work in each state under the direction of the College of Agriculture. In connection with this matter the Secretary desires to report that the Smith-Lever bill (officially known as Agricultural Extension Bill H. R. 22871) was finally passed in the House of Representatives August 23rd, 1912. This bill provides that a certain fixed sum of money ($10,000) from the Federal treasury shall be paid yearly to the Agricultural Colleges of such states as shall accept the terms of the act, and thereafter additional amounts increasing yearly in a certain definite ratio shall be paid to said institutions, providing the state appropriates similar amounts. It is understood that the first amount named will be available for use in the several states continuously whether states make appropriation or not.

This bill will be brought up in the Senate by Senator Smith of Georgia immediately on the opening of Congress December 2nd, and an attempt will be made to secure its passage during the short session. If any aid is given to this measure, immediate action will be necessary.

Fourth: Special Committees were appointed last year as follows:

Committee on Barns.

Committee to Secure Appropriation Made by the State for the Use of This Association.

Committee on Breeding Experiments.

Attention is called to the vote passed by the executive committee advising that this association secure an appropriation for its support from the state which shall be paid direct to the secretary of the association upon the presentation of proper vouchers.

Your attention is also directed to the fact that the annual report of the Commissioner of Agriculture does not contain the annual report of this association.

It will be remembered that last year on account of the refusal of the Commissioner of Agriculture to coöperate with this association a subscription was raised among interested members to guarantee the bills contracted by the association. One hundred and forty dollars were subscribed, one hundred and thirty of which were paid into the hands of the secretary and are now held subject to the order of the committee raised to secure payment of the amounts by the state.

After several conferences between the president of the association, the Governor, and the commissioner, a portion of the bills—namely, the premiums— were paid, leaving unpaid all accounts due speakers, judges, and clerical help, amounting to one hundred six dollars and ninety-six cents.

Undoubtedly your special committee will render a final report at this time and instructions can then be given for the disposition of the fund in the secretary's hands. The subscription of ten dollars remaining unpaid is offset by an account.

Respectfully submitted,

LEON S. MERRILL,
Secretary.

The report of the Secretary was accepted and ordered made a part of the records.

REPORT OF TREASURER.

To the Maine Dairymen's Association:

The Treasurer desires to submit the following report:

Dec. 7, 1911	To cash on hand	$215 37	
Dec. 4, 1912	To cash received from Secretary	43 00	
			$258 37

CREDIT.

By bills paid during year	$66 20
Cash on hand	$192 17

Respectfully submitted,

RUTILLUS ALDEN,

Treasurer.

The above report was approved and accepted.

The representatives to the Maine Federation of Agricultural Associations made an oral report which was accepted.

REPORT OF COMMITTEE ON EXPERIMENTS IN BREEDING FOR DAIRY PRODUCTION.

This committee was appointed to consider ways and means whereby the Maine Agricultural Experiment Station might be enabled to undertake a comprehensive and thorough investigation of the mode of inheritance of the character of milk production in cattle, with the ultimate object of learning how to breed intelligently for the improvement of this quality.

The committee met in Augusta on Oct. 25, 1912, all members being present. At that meeting it was officially reported

that an informal proposition had been made to the Maine Agricultural Experiment Station by the authorities of the College of Agriculture of the University of Maine to permit the use of its herd and barns for the carrying out of experiments along this line.

After careful consideration of the matter the committee arrived at the conclusion that this proposition, provided it were formally ratified by the responsible governing body of the University—the Board of Trustees—should be accepted. The committee felt that this offer would materially aid in the campaign to procure the necessary funds for carrying on the work.

On Nov. 8, 1912, the Board of Trustees of the University formally ratified and gave its approval to the following plan of coöperation, agreed to by Dean Leon S. Merrill and Prof. P. A. Campbell, representing the College of Agriculture, and Director C. D. Woods and Dr. Raymond Pearl, representing the Maine Agricultural Experiment Station.

PROPOSED PLAN FOR A COMPREHENSIVE INVESTIGATION OF THE INHERITANCE OF MILK PRODUCTION IN DAIRY CATTLE, WITH SPECIAL REFERENCE TO BREEDING FOR IMPROVED PRODUCTION.

There has never been carried through anywhere in the world any systematic or comprehensive scientific investigation of the laws of the inheritance of the function of milk production in dairy cattle. Whatever progress has been made up to this time in breeding for this quality has been built on a purely empirical basis. There is no body of well-grounded scientific principles to guide a person at the present time in building up a high producing dairy herd or improving that he already has in such a way that the improvement shall be definite and permanent. The need for investigation which shall lead to the accumulation of knowledge of the principles referred to has been keenly felt for sometime past by the dairymen in the state. The dairy industry in Maine is just now in a critical condition. The increased prices of feed without anything like a corresponding increase in the price of milk and other dairy products have materially reduced the profits of the business. For several

years past the Maine Dairymen's Association has had a committee empowered to discover ways and means if possible whereby the Maine Agricultural Experiment Station might undertake a comprehensive investigation along the lines indicated. Furthermore, this matter has been taken up by the Station Council of the Maine Agricultural Experiment Station and efforts have been made by that body to secure funds for the purpose. It is felt that the experience which the Station has gained in its long continued experiments on breeding for increased egg production in poultry would be of very material advantage in undertaking work on the problem of breeding for dairy production. The amount of work, however, under way at the Station used up all the funds which it has available and the Station is therefore not able to embark on any new project of this kind until additional funds are provided from some source.

PROPOSED PLAN FOR COÖPERATION BETWEEN THE COLLEGE OF AGRICULTURE AND THE MAINE AGRICULTURAL EXPERIMENT STATION IN CARRYING FORWARD WORK IN DAIRY BREEDING.

The following plan is tentatively suggested as a means whereby the experimental investigation suggested in the previous paragraph may be undertaken within a short time. The essential feature of the plan is that the University of Maine through its College of Agriculture and the Maine Agricultural Experiment Station should together contribute the material resources for carrying out such an investigation. The proposed contribution of each of these parties to the work is as follows:

1. *The University of Maine.* It is proposed that the University shall permit the free and untrammeled use of its present herd and such additions to its herd as may hereafter be made for the purpose of this investigation in breeding; the University retaining the right to hold any animals now in the herd, or to purchase others for educational purposes, although they may be of no value to the experiment in progress. Animals which have been in the experiment may be retained or sold as the

University may deem best when they cease to be of value to the experiment. The University, as at present, shall bear the entire cost of feeding, upkeep, and the management of the herd, except half of the salary of the herdsman which shall not exceed $60 per month for the University's share; and shall have, as now, the entire product from the herd and any and all returns derived from the herd. It will retain the privilege of using any or all animals in the herd for teaching purposes in connection with the work in the College of Agriculture, it being understood by mutual agreement that no use will be made of any of the animals in the herd by the University in such way as to affect the conduct of the experimental investigation without at least previous consultation with the Station authorities in charge of the breeding work.

2. *The Maine Agricultural Experiment Station.* A committee of the Maine Dairymen's Association is about to undertake a campaign before the next Legislature to secure the passage of an act providing for an annual appropriation of $5000 to the Maine Agricultural Experiment Station for the carrying on of investigations in animal husbandry with particular reference to this problem of breeding for dairy production. It is proposed that this sum of money shall be used by the Maine Agricultural Experiment Station in carrying on the scientific part of the investigation. This money will be used chiefly in paying the salaries of the additional staff which will be necessary for the carrying on of this work. This will include an expert and trained investigator and an assistant, a computer, a book-keeper and a stenographer, and an expert herdsman to have charge of the actual work in the barn. (A part of the expense of this man will by mutual agreement be borne by the University since in any event it is necessary to maintain a herdsman in the barn.) Furthermore, out of this fund it is expected that the Station will provide the additional apparatus and supplies necessary for carrying on work in this field. It is mutually agreed by the authorities of the College of Agriculture and the Maine Agricultural Experiment Station that the final authority in regard to the conducting of the breeding experiment shall rest in the Biologist of the Maine Agricultural Experiment Station; and the direction of the feeding, care, and management of the herd shall rest in the College of Agriculture,

with the understanding that the Biologist of the Experiment Station is to be consulted in regard to any proposed change in feeding, care and management before such is inaugurated.

Possible Additional Expense to the University Involved in Entering Upon This Coöperative Arrangement.

It is impossible to estimate exactly what will be the cost of the investigation to the University involved in possible decrease in average productiveness or in additional facilites necessary. It would be out of the queston to carry forward the investigation to successful conclusion if at every turn steps must be taken to show a financial profit on the operation. On the other hand there is every reason to believe from previous experience obtained from various investigations of this kind that the final net additional cost, if any, to the University over that necessary for the maintenance and operation of the herd for teaching will be comparatively slight. However, the moral support of the University to the project is essential, if it be entered upon at all, so that the work may not be brought to a standstill in the event of the operations showing a deficit during some year in the early stages of the work. It is felt by those most directly concerned in the matter and acquainted with the possibilities in regard to its conduct that the University should set aside as an emergency fund, which might be used in support of this work if necessary, but would not be used unless necessary, the sum of at least $2500 a year, in addition to the sum which is allowed the Department of Animal Industry for the business part of the Department.

(Signed): LEON S. MERRILL,
P. A. CAMPBELL,
C. D. WOODS,
RAYMOND PEARL.

Your committee is of the opinion that an annual appropriation of $5000 should be authorized and provided for by law, by the next legislature of the State of Maine, for the purpose of providing for the necessary expenses of the investigation. An

active campaign to secure such appropriation should be entered upon at once and the committee has taken the preliminary steps in such a campaign. It is felt that this is a project which should have the whole-hearted support of the Maine Dairymen's Association as a body, and of each one of its members as an individual, because it deals with one of the fundamental bases on which the future development of the dairy industry of Maine depends.

Your committee would recommend that it be continued for another year. If so continued it proposes to take steps to see that an appropriation bill providing for the support of this work is introduced at the next session of the legislature. The active aid of every member of this association is asked towards securing the passage of such a measure.

Respectfully submitted,

RUTILLUS ALDEN,
F. S. ADAMS,
W. G. HUNTON,
RAYMOND PEARL.

The report of the Committee on Breeding was accepted and the recommendation that the committee be continued for another year was adopted.

The Committee on Barns at the University recommended that a committee be continued for another year and the recommendation was adopted.

REPORT OF COMMITTEE TO SECURE STATE APPROPRIATION MADE FOR THE ASSOCIATION.

The committee appointed to secure the appropriation made by the state for the support of the state dairy conference have attended to that duty to the best of their ability and submit the following report:

The lack of ability, in connection with several other causes, makes this report very unsatisfactory to your committee. In

the first place your committee presented the bills of the State Dairy Conference, approved by the Secretary of the Maine Dairymen's Association—Dr. Leon S. Merrill, to the Commissioner of Agriculture for his approval. He said he would look them over and see if they were correct. But he did not approve them. Once more your committee went to the Commissioner. No satisfaction. They also went to the State Auditor and learned that the Commissioner's bills—for the Portland meeting—were in the hands of the Auditor. The Auditor asked the amount of the bills for the State Dairy Conference at Norway, and after learning that the state stipend would cover both sets, the Auditor advised taking the matter before the Governor's Council, having the Commissioner called in, and settling the matter by paying the bills of both meetings.

Your committee thought this good advice and followed it. They got a hearing before the Governor's Council with the Commissioner of Agriculture present. It was settled then and there that he would pay the bills of the Norway meeting, but he did not do so. After waiting a long time your committee again went to the Governor and had the Commissioner called in, when the Governor told him those bills must be paid. After waiting for weeks the premiums were paid but the items of expenses—a total of $106.96 are still unpaid. Your committee tee sent the unpaid bills to the Governor asking him to pay them.

One member of the Governor's Council that your committee has seen, says the bills must be paid.

Respectfully submitted,

(Signed) L. E. McINTIRE,
R. ALDEN,
W. G. HUNTON.

The report of this committee was accepted, their action approved, and the committee continued for another year.

The following resolution was introduced by Dr. Owen Smith and referred to the Committee on Resolutions:

Resolved: That the agricultural interests of the state would be better served by a Commissioner of Agriculture appointed by the Governor with the advice and consent of the Council, and answerable to them for the conduct of his office, than by one selected under the present law.

A Committee on Resolutions was appointed at this time consisting of: J. A. Ness, Auburn; J. D. McEdwards, Bangor; H. M. Tucker, Canton; C. S. Pope, Manchester; W. H. Davis, Augusta.

Other committees appointed were: Committee on New Members, Henry G. Beyer, Jr., Portland; A. W. Gilman, Foxcroft; Rutillus Alden, Winthrop. Nominating Committee, C. R. Millett, West Minot; C. R. Leland, West Minot; H. W. Evans, North Bridgton.

Voted that the Secretary be instructed to send to all persons who contributed cash for the expenses of this meeting a receipt for dues for the year 1913.

REPORT OF THE VISITING COMMITTEE TO UNIVERSITY OF MAINE.

At the last annual meeting of the Maine Dairymen's Association I was elected Visiting Committee to the University of Maine. As it was a new departure I did not know just what I was expected to do. After returning home and giving the matter some consideration I came to the conclusion that the best time to make a visit to the University would be during Farmers' Week in March. That is the time when they are expecting company, and when you are ready for company it is not hard to entertain.

So one fine morning last March I took the 8.15 train from Bowdoinham arriving at Orono about noon. I secured a room and board at the University Inn, and the room and board were all that could be asked for. The waiters at the tables are students from the University; they are thus able to earn a few dollars to help pay expenses.

In the afternoon I took a car for the University, found everybody there busy entertaining and being entertained, but the method of entertaining was different from anything I ever saw before. You know that the common custom of entertaining company is to gossip or play games, but here the company

were grouped together in the different rooms, listening to illustrated lectures by the various members of the faculty.

In one room Professor Hitchings was talking on orcharding to an interested company; in another room Dean Merrill was lecturing to a large gathering on the live stock interests of Maine; so that at sometime during the week instruction was given in almost all the different branches of farming. In fact it was a short course in agriculture.

I think I can truthfully say that it was the most profitable three days I ever spent. I only stayed three days. If I should go again (as I expect to) I should certainly stay the whole week.

I wish it were possible for every member of the Dairymen's Association to have attended this meeting. It is worth the trip there to see the cows and their method of care and handling.

The University is certainly doing all it can to help the dairymen in Maine, and when you notice the yearly records of the different cows in the University herd you will have a good object lesson of the profit in dairying from the right kind of cows with good care. One of the greatest needs of the dairymen in Maine is better cows, and that brings up the old question of breeding, a question on which dairymen need more information, and I understand that the Experiment Station in connection with the College of Agriculture is about to undertake exhaustive investigation along these lines.

Brother dairymen and brothers of all the other agricultural organizations in Maine, let us all work together to boom Maine along agricultural lines.

Respectfully submitted,

(Signed) F. S. ADAMS.

The report was accepted and made a part of the records.

ANIMAL NUTRITION.

By PROFESSOR P. A. CAMPBELL.

Unfortunately there is too wide a breach between the fundamental principles of the nutrition of animals and the applica-

tion of those principles to the art of stock feeding. Each in a way is dependent on the other, yet it is seldom that the man who is working in the science of nutrition is a successful feeder; nor is the practical feeder usually grounded in even the more common fundamentals of nutrition.

One of the evils of the present day is the large percentage of waste which is permitted by the human race. To the conservative stockman if five or ten per cent of the feed supplied to the animals is not eaten, but is allowed to be pushed out of the feed troughs or cribs and trampled under foot, it appears like a large and needless waste, yet that same stockman may be permitting an even greater waste by unbalanced feeding. If the feed stuffs supplied to the animals are of such a character that the animal must eat an excess of one ingredient to get the necessary amount of some other, it is not only wasteful but harmful and the eliminative organs are often overtaxed to throw off this unnecessary material.

The so-termed balanced ration has appeared to the average stockman as something beyond his grasp and comprehension; and unfortunately has too often meant merely a combination of feeds regardless of their character, provided they carried the requisite amount of digestible nutrients. A balanced ration of that kind is far worse than a ration where no endeavor has been made to have it conform to any definite ideas, except to appease the animal's hunger.

A ration may be said to be balanced when it supplies all the needs of the animal, whether the animal be working or resting. Chemical methods lack so much when compared with life processes that it is extremely doubtful if an exactly balanced ration is ever fed, or if such a one happens to be hit upon in the regular feeding work, the feeder does not recognize it.

In order to more fully understand some of the phases of nutrition and its application to practical feeding, it becomes necessary to consider for a time some of the elements and their compounds which enter into plant and animal life, also the function of each.

Plants directly or indirectly supply all food for animals, except air, water, and salt, and more or less of the water and salt is supplied by means of the plants. Of the eighty or more of the known chemical elements thirteen are essential to plants.

After the seed germinates and the young plant has utilized the small amount of food which was stored in the seed, it begins to draw upon the soil and air for its support. Upon analysis of the plant the different elements are found grouped together in various compounds. The chlorophyll—containing protoplasm of the plant's leaves,—with the aid of the sun decomposes the carbon dioxide of the air and the water which has been largely drawn from the soil by the plant's roots and recasts their elements into the plant compounds, sugar, and starches, and their allied compounds, which together are commonly called carbohydrates. Thus the heat of the sun is stored up in the plant and when set free either by combustion or some other way, heat or energy, which are synonymous terms, are given off, no matter whether it be under the boiler or in the animal body, to keep up the natural body heat or to perform some form of work.

The five general compounds which have to do with the animal nutrition are water, ash, or minerals, protein, carbohydrates, and fat.

Water is found in all feed stuffs varying in amount from a few per cent in some of the grains and their by-products to about 90 per cent in some of the succulent feeds like turnips. The animal body also contains a considerable amount of water, varying upon the condition of the animal as well as upon the age and species of the animal. In general, more than half the weight of the animal body is water, which is continually being given off from the body in the form of vapor from the lungs, in the form of perspiration from the body, and in considerable amounts through the kidneys; and in the case of the milking cow large quantities are used in milk elaboration. Large amounts are necessary for the body functions, and a regular supply is necessary. It is the water held in the plant which gives to green or succulent feeds their palatability and through this palatability increases the secretion of the digestive juices in the alimentary tract, thus effecting a more thorough digestion, and usually creating a natural laxativeness. Consequently at seasons when animals are usually kept on dry feeds, if the ration is supplemented with some succulent feed, whether it be in a green form (just as it grows) or in a form in which it can be stored in its natural condition like the root crops, or

preserved in the form of silage, the results are beneficial and the feeder gets through it a more thorough digestion of all the feed stuffs fed, and better results in the health, growth, and production of his animal.

As all feed-stuffs contain more or less ash or mineral matter, it is generally conceded even by experienced feeders that in the natural course of feeding the animal will be supplied with sufficient ash for its requirements. But with the endeavor to produce a greater economy in feeding and with the modern methods of milling it is more than likely that the supply of ash sometimes becomes unbalanced, and there is need for paying more attention to it. The ash is what remains of the animal after all that burns has passed away, and in the live animal it has a direct connection with the life processes.

Jordan states that 83.9 per cent of the ash content of the bone is calcium phosphate, and to this compound is due the hardness and stability of the bone. If there is a deficiency of calcium and phosphorous in the food, it results in a malnutrition of the bones if continued, as is shown by a lack of development of those parts. The animal will lack size, muscular growth is interferred with, and in mild cases the growth is very largely of fat. The bone probably acts as a sort of storehouse for the mineral matter and supplies the rest of the body if the food supply becomes low, in order that the metabolic processes may be maintained. At the Wisconsin Experiment Station a cow gave off 5.5 per cent more pounds of lime in milk and excrements than was in the food, when fed a ration low in lime. A condition like this results in brittleness and porosity of the bone, and if it were continued would mean disaster to the animal. At the Geneva Experiment Station it has been proven that it is the mineral constituents of wheat bran which make it a laxative for ruminants at least, and the bran when freed from these salts is quite constipating.

Iron is a part of the haemoglobin of the red corpuscles, and through its affinity for oxygen, the oxygen is carried from the lungs to the tissues there to unite with the carbohydrate nutrients of the cells, which causes a breaking down into carbon-dioxide and water. Thus the heat or energy which was used in binding them together in the leaves is liberated. This energy came, of course, from the sun, and to quote directly from

Forbes, "When liberated in the animal cell it is manifest in heat and in the various movements and processes which constitute life." Thus it is seen that iron, although of minute quantity in the animal body, is absolutely essential.

Citing a few other uses of ash in the animal body as given by Forbes of the Ohio Experiment Station we find that calcium in the blood is essential to its coagulation without which small wounds would result in death by bleeding. Again mineral chlorides furnish the chlorine of the hydrochloric acid in the gastric juice; the ferment pepsin being inactive except in the presence of hydrochloric acid. There are other uses to which the ash is put in the animal body but sufficient has been said to indicate the relative importance of the mineral elements, and the necessity of giving them consideration, although as yet enough is not known about them so that the feeder can give a great deal of attention except to get an idea of those feed stuffs which carry an abundance and of those which are deficient; for example, among the common feeding stuffs it is well known that wheat bran, clover hay, and meat meals are rich in ash, while anyone who has fed hogs on a clear corn ration knows it is deficient in ash, as is shown by the fact that the hog fattens quickly, but does not grow bone of sufficient size to keep it from going down; that is, the body gets too heavy for the strength of the bone.

The compounds—carbohydrates and fat—are known as the heat and energy producers. Each is made of the three elements —carbon, hydrogen, and oxygen; in the carbohydrates the unit of hydrogen and oxygen being in the proportion of two to one, while in the fat there is a large number of carbon and hydrogen units in proportion to the oxygen.

The cell walls—thin and tender in the growing plant, hardy and woody in the mature plant—form what is called cellulose or fibre.

The nitrogen-free extract is the total dry matter of the plant, less the ash, crude protein, fibre, and fat, and is composed of the starches, sugars, pentoses, and non-nitrogenous organic acids.

The fibre and nitrogen-free extract, together constitute the compound that is termed carbohydrates. A feed stuff which carries a large percentage of carbohydrates is spoken of as

carbonaceous. Thus most of the roughage except the legumes is carbonaceous, also corn and most of its by-products.

Glucose, or glucose-like sugars, are the only forms in which the carbohydrates can be used in the animal body; except milk sugars which may be absorbed in minute quantities from the alimentary tract. The saliva secreted from the glands of the mouth contain a ferment, ptyalin, which partially changes the starches into sugars. Aside from this the saliva moistens the food and thereby aids mastication. It is said by some authorities that an average sized cow will secrete 112 lbs. of saliva in 24 hours. Ptyalin action may continue in the first part of the stomach; from the stomach most of the carbohydrates are carried on into the small intestine, and are acted on by the amylopsin.

There seems to be no ferment especially adapted to digesting the collulose, and bacteria of the alimentary tract attack it.

The fats become broken up into glycerine and fatty acids, and become partially saponified. These soaps and the glycerine are absorbed by the intestinal walls, in the cells of which they are reunited into fats and are given into the circulation as such. It is plainly evident that the fats in the feed stuffs fed to the animals indicate to a certain extent the character of the fat after it has become absorbed and known as animal fat. Fats of a low melting point when fed to animals produce animal fat with a low melting point, and vice versa with fats of a high melting point; hence the reason why some of the dry feeds, barley and cottonseed meal, produce a milk fat of which the fat globules are hard and require a higher churning temperature, also why corn and its products, linseed meal and some of the succulent feeds, produce fat of a low melting point and a soft butter unless the cream is kept at a lower temperature.

The uses to which carbohydrates and fats are put in the animal body are not materially different. Fat has a greater heat or energy producing value than the carbohydrates which (as near as can be determined by the chemist) is supposed to be 2 1-4 times as great.

After the carbohydrates in the form of glucose have entered the circulation they are found stored in the liver in the form of glycogen, and in very minute quantities in the muscles and blood. When work is done the glycogen of the muscles is

first drawn upon, then that which is stored in the liver. The glucoses may also be converted into fats and stored as body fat. Thus it is seen that fats and carbohydrates practically do the same work, that of producing heat and energy, or storing up body fat.

Protein—the last of the compounds to be considered—differs from carbohydrates in that it contains nitrogen, sulfur, and sometimes phosphorus. The percentage of protein in a feed stuff is determined by taking the amount of nitrogen and multiplying by 6 1-4, as it is found by the chemist that about 16 per cent of the plant protein is nitrogen. Protein is made up of various proteids, and varies more or less according to the source, although as yet there is not a very clear understanding just how the part they play in animal nutrition varies.

Protein digestion begins in the stomach, and follows in the small intestine. The protein is attacked by ferments and is split up into simpler compounds which take up water and become more soluble. After being split up and acted upon by the various ferments until they are in their simplest forms, animo acids, and are soluble in the intestinal juices, they are then ready for transference through the intestinal walls and constitute the nitrogenous building material out of which the protein tissues of the animal body are built.

Most of the digestion and absorption takes place before the large intestine is reached, and the contents of the large intestine consist of undigested substances of all kinds taken in with the food—bile salts which have escaped resorption, water, mineral salts, and fragments of the lining of the small intestine. A small amount of digestion may occur here if ferments have escaped from the small intestine and there is more or less bacterial action. Any soluble products which may arise here as a result of digestion are absorbed.

The waste which finally escapes from the large intestine forms the excrement or feces of the animal.

Considering the process of digestion it can readily be seen that it is not the food which the animal eats, but that which is digested and finally absorbed into the animal body which actually counts. Again for an economy of the food nutrients it is desirable that they be in the right proportions to prevent the animal body from wasting them.

All the tissues of the animal body are continually breaking down and wasting away, and are being continually repaired from the new food nutrients which are assimilated. The nitrogen passes from the body in the urine, and the amount passing is considerable; even if protein is entirely withheld the nitrogen continues to be thrown off from the body in this manner—first drawing upon the circulating protein and then at the expense of the organized tissue. If the protein is increased until nitrogen equilibrium is reached, it will stop the body waste, but in mature animals is not likely to result in storing up body protein. If the protein is fed in excess, it does not become an entire waste as the nitrogen part may be split off and the remainder or non-nitrogenous part be converted into glucose; thus, while the protein may do the work of the carbohydrates and fat to a certain degree, the carbohydrates and fat will not take the place of protein.

This does not, however, signify that it is an economical method of feeding. In both the plant and animal food the most expensive element is nitrogen, and so far as the animal feeder is concerned when an excess is fed it becomes an entire waste, also is expensive from the standpoint of the animal body, as the cost of digesting, assimilating, and freeing the body from the excess nitrogen uses up considerable energy and overworks the animal body, especially the excretory organs.

From the foregoing it has been seen that there is a necessity for supplying the food nutrients in about the right amount to satisfactorily and economically feed the animal. Yet to be able to do so is a harder problem. Many experiments have been carried on both in this country and in other countries, in order to make these determinations. The results of the experimenters do not always agree, and rightfully so, as there are many varying conditions which enter into experiments of this kind, such as climate, character of feeds, and in the case of the dairy cow the work she is doing.

The dairy cow has the following varying factors which must be considered. The size of the animal will vary the amount required for maintenance. The length of time that she has been bred must necessarily influence the amount of food, also the amount of milk she is giving and the percentage of fat in the milk.

There are other factors which must also be considered. The stomach of the dairy cow has a large capacity, and it is essential that she receive a considerable amount of dry matter in order to properly digest the ration and get the fullest advantage from it. By dry matter is meant the food fed less its water content. For an average sized dairy cow, it is safe to figure that there should be at least over 20 pounds of dry matter. This feature of the ration will usually take care of itself, provided that the ration is composed of roughages and concentrates; and the practical feeder will note from the looks of the animal whether it is receiving sufficient dry matter,---a well filled barrel usually indicating a sufficiency. The character of the dry matter, however, is of considerable importance. Dry matter may be supplied in the form of very cheap roughages like the various straws, corn stover, or even swale hay, and if the food nutrients are furnished in the concentrates, the results will be satisfactory. It must be remembered that the actual gain to the animals from such feeds is very limited, or, in other words, the net energy gain is very small—that is, the amount gained by the animal is largely utilized in handling the food; consequently the food nutrients in other feeds should be increased accordingly. The reason for speaking of the cheaper roughages is that the most proficient feeder always uses such feeds as he may have at hand, and if necessary supplements those by purchased feeds.

The one difficulty experienced by feeders is to provide them in a palatable form. While it is true that the well fed animal will sometimes refuse this form of feed, yet if the animal is in good condition and carefully fed, there will be but little difficulty; various feeders have different methods of preparing these feeds which do not usually increase their digestibility, but do sometimes cause the animal to eat them.

Some form of succulent feed should be provided for. The chemist can give the analysis of a succulent feed, also the percentage of it that is digestible; yet when fed to the cow that is well fed she accounts for more of it than can the chemist. The explanation lies in the fact that most succulent feeds are very palatable; that is, they contain quite a percentage of water and are either green or preserved in such a form that they contain the same qualities as a green feed. The cow is particu-

larly fond of them, and the results are an increased flow of the digestive juices or ferments with a somewhat more thorough digestion of all the feeds eaten. They have a tendency to create a laxativeness which also keeps the cow in good physical condition.

Some of the grain ration (if composed of whole grains) may pass into the digestive tract in an unground form, and is not thoroughly acted upon by the various ferments, hence an incomplete digestion. On the other hand, if they are all of a very fine character, the saliva of the mouth, which only acts upon the starch, may moisten and stick them together so thoroughly that the ferments do not get a chance to act upon them in a satisfactory way, and while the digestion is far more complete than in the case of the whole grains, there is still a chance for improvement. If the grain portion of the ration is of such a character that the hard grains are ground fine, but still has something bulky to keep it from becoming compact, the digestion is the most complete. This gives the grain portion of the ration bulk, or makes it light weight. Distillers' grains, brewers' grains, bran, ground oats, or even hulls or corn cob when they are not purchased for something better, help to give the grain ration this bulkiness. The fact that both the succulent feeds and bulky grain rations insure a more thorough digestion, also insures a more perfect condition of the animal as the digestive troubles, going off feed, and udder troubles are largely eliminated.

The relative amounts of digestible protein, carbohydrates, and fat which are fed to the animal are of vast importance. Cows are not so frequently over-fed as under-fed, but there is sometimes a wrong relation between the amounts of the nutrients fed. Just what amount of food nutrients is called for by the animal is hard to determine. We have feeding standards, which may be used as guides, but only as guides. Few feeders realize that the well fed cow utilizes nearly 50 per cent, and sometimes more, for mere maintenance, and that the profit to the feeder comes after the maintenance requirements have been satisfied.

Haecker's maintenance standard (which is lower than most others) calls for .7 lbs. digestible protein, 7 lbs. digestible carbohydrates, and .1 lb. of digestible fat for a 1000 lb. cow. This,

however, merely provides for keeping the animal at a uniform weight, and in the case of the milch cow does not provide for any gain to the animal or for the development of the fetus. Haecker's standard also calls for not only the amount of the different food nutrients for each pound of milk produced, but varies it according to the percentage of fat in the milk. We have found that more food nutrients are required usually than Haecker calls for when the animals are producing in such a way as to produce economically.

If the pounds of digestible fat are multiplied by 2 1-4 and added to the digestible carbohydrates, and this divided by the number of pounds of digestible protein, the result should not be less than five for the heaviest milkers, and may be as much as six for lighter producers. If this precaution is taken, as well as taking into consideration the physical character of the food, there will be but little trouble with the feeding. The amount of grain to feed in addition to the roughages depends to a large degree upon the ability of the animal to handle it, and also upon the price received for the products. To the keen business man it is readily seen that if a certain value of feed is given to the animal and she returns the value of this feed and a profit, it is good business to let her have the feed. The point at which she fails to respond with a profit should be determined with each individual cow.

The cow that has just freshened frequently gives off more food material in her milk, plus what is required for maintenance, than can be accounted for in the feeds given her. In order to do this she has to draw upon that stored in her body. This should indicate to the feeder that in order for her to do this she must be in good condition herself; hence, during the latter part of the lactation period she must be fed in such a way that she not only is able to nourish the developing fetus but may be gaining herself.

It should be the aim of the feeder to so handle and feed his cow at all times that she will produce economically; that she will not be worn out in endeavoring to handle a ration poorly adapted to her needs, thus shortening her usefulness; and in order to do this it must be remembered that the ration should be palatable, should contain some form of succulence, should be of such a character that it is easily digested; that

the dairy cow requires considerable for maintenance, that she cannot work well unless the body is in good condition, and above all that she requires the watchfulness and personal supervision of the feeder.

The demonstration in judging dairy products—by Professor R. W. Redman of Orono— was given in the laboratory of the city milk inspector and was immediately followed by the judging contest for the Dairymen's Silver Cup.

An address was given at this time by Mr. E. A. Bishop, Secretary of Advanced Registry of the American Guernsey Cattle Club on Advanced Registry Records. Mr. Bishop gave a very interesting and instructive address, and the Secretary regrets that copy is not available for printing.

ANNUAL BANQUET.

The annual banquet of the Maine Dairymen's Association and Maine Seed Improvement Association was held in connection with the Portland Farmers' Club at the Congress Square hotel, Wednesday evening, December 4th.

It was attended by one hundred and thirty-five people. An excellent menu, fine music, and interesting speeches all contributed to a most enoyable entertainment.

PROGRAM.

The Farmers' Inheritance, Professor L. A. Clinton
Storr's Agricultural Experiment Station

New England Opportunities, Mr. W. H. Seeley,
Industrial Agent, New England Railroad Lines

What the University Can Do for the Farmers,
Dr. Robert J. Aley
President, University of Maine

THURSDAY, DECEMBER 5.

BUSINESS SESSION.

President McIntire introduced the matter of the failure of the Commissioner of Agriculture to print in his annual report the report of the Maine Dairymen's Association as required by law and reported the action taken by himself as President in bringing this omission to the attention of the Governor and Council; and read a copy of the communication which he had caused to be forwarded, as follows:—

"NORWAY, MAINE, DECEMBER 2nd, 1912.

"*To the Governor and Executive Council of the State of Maine, Augusta, Maine:*

"Your attention is hereby most respectfully called to Section 7 of Chapter 60 of the Revised Statutes of Maine, which provides that the Commissioner of Agriculture shall annually make a report to the Governor and Council, on or before the first day of January of each year, of the work of the Department of Agriculture in detail, combining in the same a report of the *State Dairymen's Association,* and for the purpose of making his said report, said association shall furnish the Commissioner of Agriculture with all necessary data therefor, on or before the first day of December of each year.

"Under the provisions of that Statute, the president of said State Dairymen's Association, Mr. Leslie E. McIntire of Waterford, seasonably furnished the said Commissioner of Agriculture with a carefully prepared, detailed report of the meetings, lectures, proceedings and work of the association, for the year last past, being in volume and scope much the same as that furnished for many years past and printed as a part of the annual report of the Commissioner of Agriculture, in accordance with the Statute above quoted.

"This report and data were delivered in person by Mr. McIntire into the hands of the Commissioner of Agriculture, his assistant and clerks, so there can be no mistake as to the receipt of the same by said Commissioner of Agriculture in season to be included in and made a part of the printed report provided for by said law.

"The State Dairymen's Association further respectfully call your attention to the fact that the Commissioner of Agriculture has utterly ignored the data and report furnished him as aforesaid by the president of said association, and has neither included the same in his report, nor made any mention therein of the work of the association for the year last past.

"The State Dairymen's Association feels justified in urging that the Hon. J. P. Buckley, Commissioner of Agriculture, has been antagonistic to its interests and to the work which it has sought to accomplish during his term of office, and charges him with having wilfully omitted, neglected and refused to print said report of its meetings, proceedings and doings, thus violating his plain duty as set forth in the Statutes of the State of Maine as hereinbefore stated.

"Said Association further urges that for a long series of years a full detailed report of its meetings and the proceedings thereof, and of the work done by and through its organization has been printed with and made a part of the annual report of the Commissioner of Agriculture, that said association has been fully recognized by the state for many years, and that it will be a great loss, not only to the association itself and its patrons and members, but to the state at large, should this report not be printed and distributed, as for so many years has been done.

"It is therefore most respectfully urged upon His Excellency, the Governor and his Honorable Council, to demand of the said Commissioner of Agriculture an explanation of his conduct in respect to the matter herein set forth, and to require of him that he cause to be printed, published and distributed the above mentioned report of the State Dairymen's Association which he has so willfully neglected and refused to combine, and include in his annual report, and that the power and authority of His Excellency and his Executive Council be used to the end that justice shall be done, and that the spirit of the law in respect to the printing, publishing and circulating of the report of said State Dairymen's Association be regarded.

Most respectfully,
STATE DAIRYMEN'S ASSOCIATION,
By ITS ATTORNEY."

The president's report as stated above was accepted.

The premium awards were announced at this time and will be found complete in classified form at the close of this report.

The Committee on Nominations reported as follows:

President—L. E. McIntire, East Waterford.

Vice-President—Henry G. Beyer, Jr., Portland.

Secretary—Leon S. Merrill, Orono.

Treasurer—Rutillus Alden, Winthrop.

Trustee—J D. McEdwards, Bangor.

Member Experiment Station Council—Rutillus Alden, Winthrop.

Delegates to Maine Federation of Agricultural Associations—Charles R. Millett, West Minot; W. W. Pike, Cornish.

Visiting Member to College of Agriculture—Frank S. Adams, Bowdoinham.

Committee to Secure Appropriation made by the State for Support of State Dairy Conference—Leslie E. McIntire, E. Waterford; W. G. Hunton, Cherryfield; Rutillus Alden, Winthrop.

Committee on Barns at University—L. E. McIntire, E. Waterford; E. C. Carll, Augusta; Leon S. Merrill, Orono.

Committee on Breeding Experiments—Rutillus Alden, Winthrop; Frank S. Adams, Bowdoinham; W. G. Hunton, Cherryfield; Raymond Pearl, Orono.

(Signed) C. R. MILLETT,
R. O. JONES,
C. R. LELAND,
Nominating Committee.

It was voted to accept the report.

It was voted that Mr. C. R. Millett be authorized and instructed to cast the vote of the association for the above named persons nominated for the various offices.

Mr. C. R. Millett cast the vote of the association for the persons nominated for the several offices as follows:

President—L. E. McIntire, E. Waterford.

Vice-President—Henry G. Beyer, Jr., Portland.

Secretary—Leon S. Merrill, Orono.

Treasurer—Rutillus Alden, Winthrop.

Trustee—J. D. McEdwards, Bangor.

Member Experiment Station Council—Rutillus Alden, Winthrop.

Delegates to Maine Federation of Agricultural Associations—Charles R. Millett, W. Minot; W. W. Pike, Cornish.

Visiting Member to College of Agriculture—Frank S. Adams, Bowdoinham.

Committee to secure the Appropriation made by the State for the Support of State Dairy Conference—Leslie E. McIntire, E. Waterford; W. G. Hunton, Cherryfield; Rutillus Alden, Winthrop.

Committee on Barns at University—L. E. McIntire, E. Waterford; E. C. Carll, Augusta; Leon S. Merrill, Orono.

Committee on Breeding Experiments—Rutillus Alden, Winthrop; Frank S. Adams, Bowdoinham; W. G. Hunton, Cherryfield; Raymond Pearl, Orono.

And they were formally declared elected.

RESOLUTIONS.

Resolved: That one of the most pressing needs of the live stock interests of Maine today is a more adequate knowledge than now exists in regard to the laws of breeding domestic animals for particular economic purposes. The Maine Dairymen's Association is of the opinion that in order to meet this need the Maine Agricultural Experiment Station should undertake at the earliest possible moment thorough and systematic investigations in the field of animal industry, with special reference to the laws of breeding cattle for productive qualities, and desires hereby to extend its hearty support to the proposed plan to secure an annual appropriation of at least $5000, to be continued until the investigation is completed.

Resolved: That the agricultural interests of the state would be better served by a Commissioner of Agriculture appointed by the Governor with the advice and consent of the Council and answerable to them for the conduct of his office, than by one selected under the present law.

Resolved: That a legislative committee, to be appointed by the president, he to be a member by virtue of his office, be instructed to present this matter to the next legislature in such a manner as to insure its passage if possible.

Resolved: That the committee on barns be continued as a legislative committee on barns at the State University; that we recognize the great need of new barns at the University and that this commitee continue to use the influence of this association to secure them.

Resolved: That this association give its hearty support to the effort to secure aid from the federal government for the support of extension work in each state under the direction of the College of Agriculture; and that we, therefore, urge the passage by the congress of the United States of the so-called Smith-Lever Bill—Agricultural Extension bill H. R. 22871—hereby reaffirming the position which this association has consistently maintained in the past.

Resolved: That we believe the joint meeting of the Maine Dairymen's Association and the Maine Seed Improvement Association has been a great success; that we favor the continuance of these union gatherings, and that we believe it would be for the best interests of the agricultural organizations of the state if as many as possible of them should unite in these winter meetings.

Resolved: That the legislative committee above provided for be directed to make an effort to secure an amendment to the agricultural law providing that the appropriation for the support of the state dairy association and the state dairy conference shall be paid directly to the

secretary of this association upon the presentation of proper vouchers.

Resolved: That the legislative committee be authorized and directed to use its best efforts to secure the publication in printed book form of the last annual report of the Maine Dairymen's Association as provided by the statute governing the same.

Since the last annual meeting of this association, there has passed to his long home the Hon. Z. A. Gilbert, one of the original promoters of this organization, a man who long took an active and prominent interest in every form of agricultural progress.

Resolved: That we hereby place upon record our appreciation of his splendid life and character, recognizing the value of the work which he carried on during many years through his official and journalistic connections for the progress of farm and dairy development.

Resolved: That especial commendatory mention should be made by this association of the splendid exhibits of dairy machinery and supplies shown in connection with this meeting. The value of such a showing of the most up-to-date appliances for carrying on the business of dairying can hardly be over-estimated. We appreciate the efforts of the dealers in agricultural machinery and supplies to make this exhibit of real value, and express the hope that it may be profitable to them as well as to us.

Especial mention should also be made of the splendid exhibit of dairy products, milk, cream and butter, in which many of our leading dairy farmers and creamerymen have combined to make it the largest and best exhibit ever held in Maine.

Resolved: That as an association we appreciate the splendid hospitality of the city of Portland, the Portland Board of Trade, and the Portland Farmers' Club, in the manner in which they have entertained this convention, and that we desire to express our thanks by these few words, assuring the people of Portland that we shall continue to express our appreciation of their hospitality after we have left the city. We look upon Portland as our city none the less because the majority of us live in other parts of the state. We appreciate the courtesies extended by the press, the railroads, and the individual courtesies of the people of the city.

WILLIAM H. DAVIS,
J. D. McEDWARDS,
C. S. POPE,
H. M. TUCKER,
J. A. NESS,
Committee on Resolutions.

IMPORTANCE AND PLACE OF DAIRYING AS A BUSINESS IN MAINE AGRICULTURE.

W. W. PIKE, Cornish.

That dairying is and should continue to be a business holding a very high position in Maine agriculture, is, I believe, a self evident truth. In fact many reasons might be brought forth in support of the statement that it is of *supreme* importance.

Certain it is that no branch of agriculture promises a more wonderful development or is so replete with far reaching possibilities. Our soil, climate and location as well as the character of the men and women who comprise our population, all conspire to produce results in this direction which challenge the competition of the most favored sections of the globe. Revelling in the sweet, lush grasses of our hillsides, drinking from the cool springs which pour their pure waters from our granite soil, her aesthetic tastes satiated by the diversity of crops made possible by our location and climate, the dairy cow of Maine evolves a product which under the skilled touch and keen discernment of our people attains those fine points of quality which satisfy the exacting tastes of the Epicurean and find an ever waiting market. Thus the already large income of our dairy products is easily capable of almost indefinite multiplication, adding untold wealth to our Maine agriculture.

Again, the dairying industry is of tremendous importance in its relation to the conservation of the fertility of our soil, a feature which vitally concerns not only ourselves but the welfare of the generations to come. In no other branch of our agricultural economy is it possible to sell so valuable a product and yet retain upon the farm so large a proportion of the elements of fertility. Thus the dairy cow becomes a soil builder rather than a soil robber, furnishing a product which above all others is rich in those elements which are indispensa-

ble to the life, health, happiness and vitality of the people, yet returning to the soil those elements which ever make for increased production. The truth of this is amply attested by the fact that other conditions being equal, in those sections where dairying reaches the highest point of perfection is to be found the most fertile soil as well as the highest prosperity of the people.

I have no desire to minimize the importance of other branches of our Maine husbandry; all are necessary and all are important in our agricultural economy; but I do contend that dairying should and does occupy a position which in view of the enormous value of products, the resulting prosperity of the people and the conservation of soil fertility, commands our highest endeavor for its proper development and is worthy of our best cultured efforts. Nor can the importance of the business of dairying be measured from a pecuniary standpoint alone. It cannot fail to exert a lasting and beneficial effect upon the moral and intellectual stamina of the populace. The cow in her native state we are told gave only milk enough to nourish her offspring for a short time, and to develop from this crude animal the modern dairy cow with her marvelous efficiency has required the acme of skill and the employment of man's highest intellectual faculties. The successful dairyman is by brought face to face with problems which have to do the most intricate phases of biology and as he delves ever deeper into the mysterious mazes of her being, and begins to comprehend the stupendous possibilities which ever beckon him on, the dairy cow becomes a potent factor in *his* development also.

As the companionship of a good woman has an appreciable effect on the lives of her associates, so the constant companionship of the gentle dairy cow tends to develop in man the finer attributes of his being while at the same time she inspires him to the cultivation of his highest mentality that he may more successfully master the mysteries of her development.

Nowhere in the realm of agriculture is required to so large a degree the exercise of man's highest powers for observation and scientific research as is found in the breeding and feeding of the dairy animal, and the care and perfection of her product that it may properly fulfill its function in the nourishment of

mankind. And it is an occupation that merits and may well receive our most careful consideration for on the products of the dairy depend to an almost inconceivable degree the health and happiness of the race. So familiar have these become and so common their use that we fail to appreciate the tremendous part which they play in our human economy. Even at the prevailing high prices of milk it easily becomes one of the cheapest sources of nutrition, a food suitable at once for the strong man as he goes to his daily toil and for the invalid seeking strength and nourishment to withstand the ravages of disease; while upon its life-giving properties hang the destinies of the countless thousands of infant lives. While playing an important part in the composition of the rich man's food, it is also within reach of the purse of those in the humbler walks of life and the slightest diminution in its production entails inconvenience and hardship.

For other agricultural products a substitute is easily provided but only in the most limited degree can we dispense with the use of our dairy products.

I am aware that I am bringing to your attention no new theory neither am I dealing in facts that are unknown to you; but it is meet that we should pause at times to consider those things which in their familiarity have for the time being lost their hold upon our attention and thus fail to receive the consideration which their importance demands.

If I succeed in this brief paper in bringing to your minds some thoughts which shall serve as the embryo of deeper meditations leading to a higher appreciation of the importance of our calling as dairymen and the part we play in the supplying of this most necessary portion of our sustenance, my efforts will not be in vain.

Conceding its importance, what place shall dairying occupy in our Maine agriculture?

As I have previously stated, I do not wish to minimize the advantages of other branches but it does seem to me that dairying has many distinct points of superiority. The dairyman has a steady income from the sale of his products with very little fluctuation from year to year. In other branches of our Maine agriculture the farmer often labors all the year only to find at last that his crop must be sold for less than cost of production

if indeed he is able to find a market at all. Contrast this with the lot of the dairyman who has hardly to give a thought to the selling end of the business, with a market far in excess of his production, yielding a steady remuneration from month to month. And this market is sure to increase with great rapidity if we grasp the opportunity which lies at our door. Not only are our dairy products eagerly sought after to supply the demand which their excellence has created in other states, but the growing popularity of Maine as a summer resort must result in the creation of a home market which will tax our resources to the utmost.

With such flattering prospects opening up before us, is not our calling worthy of the supreme place in our Maine agriculture? Let us wake up to the possibilities of dairying in Maine, for while we may well be proud of the success we have already attained, there is ample opportunity and generous remuneration for the exercise of our most earnest and intelligent endeavor.

HOW SHALL DAIRYING AS A BUSINESS BE PROMOTED.

By Dr. H. M. Moulton.

The State of Maine has a great future before her as a Dairy State. Even though her lands and waters give scope for commercial industries and diversified interests, still she ought to retain pre-eminence in Dairying. In a way we are just on the threshold of a great dairy development. We and our forefathers have been dairying for a century or more but it is only in the last twenty years that we have entered upon the serious discussion of the business. This discussion has been productive of great good.

The bright, keen-minded young men, the active and intensely interested young fellows, are taking hold of the work and entering the business of dairying. The elderly and experienced are

spurred on to better efforts. This activity and live interest means much. The dairy business will continue to be one of the foremost industries of this state and continue to gain in importance and we dairymen will be inspired to better efforts.

In the whole state of Maine there were but 155,000 milch cows on January 1, 1912. This is not what such a state as ours should show, as naturally it is well endowed by Nature for dairying, especially butter making. While in the year from January 1911 to January 1912 there was no loss in numbers, neither was there any gain.

Well watered in almost all parts, with good pastures in many sections and the best butter market in the United States in Boston, there should be thousands more butter cows in Maine.

Farmers in our state have often raised the objection of dear feed, when excusing the low ebb of interest in dairy work now evinced. Any feed in any location is dear if it is the wrong kind of feed. High priced grains and timothy hay will make dairying dear in any section.

Clover or oat and pea hay can be as easily grown as the horse hay, timothy, which so many of us will insist on using for our cows, for whom it was never intended. It has not enough ash, not enough protein to make it of value! Why use it in place of hay with good proportions of red clover or mixed grasses and clover, having more than twice as much protein as timothy, which has but 11.2 pounds to every hundred.

Corn stalks, even when steamed or moistened, are no substitute for a succulent food like silage. I should like to see a silo on every dairy farm in Maine, and if there were one, the price of producing our milk and butter would be greatly lowered. If we can't grow Dent corn, we can grow Flint corn and we should do it. Every man who farms should keep cattle for the good of the farm, we know; but he should make the cattle keep themselves and pay a profit, too. They will feed your land and make good return by the pail and churn if you will feed them.

We can grow plenty of oats and nothing on earth will give us the flavor, in butter, that will come from feeding our cows ground oats. A well flavored butter will command a good price, especially in such a market as Boston, right at our doors.

We make good cheese in Maine, but we do not make enough;

we make good butter, but we don't make all we could; we have good cows but we don't have half the number we ought to have. Why! Florida, a State one does not associate with dairy cattle at all, has 123,000 to our 155,000; Colorado has 167,000; and New Jersey, which ought to be an extra good dairy state, but is a very poor one, comes within 5,000 of us.

We need to awaken to the possibilities of our state and develop them. Get good bulls, Jerseys or Guernseys, Holsteins or Ayrshires, from dams of producing power and grade up steadily. That does not apply only to grade herds, as many a registered herd needs grading up, badly. Right here, permit me to give some thoughts that are in my mind as regards grading up a herd of dairy cattle:

First: Breed to the very best bulls procurable, from dams of unquestionable ability at the pail and churn and as near as possible to individual perfection—especially in the udder, teats and milk veins. It is essential that the qualities possessed by the progenitors be inherited so that they can be transmitted.

Second: Breed the daughters of such a sire to one equally as good in every way, keep your calves from your best cows and grow them every day they live up to freshening by feeding them a growing ration—to make bone and muscle and tissue and udder—and give protein and ash enough to put into them milk after the calf they carry is born.

Third: Develop your cows so that each generation produces all that she is capable of doing, without undue forcing.

Fourth: Having "a good thing," use printer's ink freely to let your brother breeders know what you have. The moral is: If you want to procure top prices "breed not only from the best and most prepotent source, but breed Utility and Beauty combined."

You can tell your best cows by two things without which you will be simply groping in the dark; and they are a scale and a Babcock tester. The man who "guesses" his cows give ten quarts or twelve quarts is liable to be the man who feeds by guesswork and breeds by guesswork and finds "dairying doesn't pay." An ordinary scale is a matter of small expense and in a ten cow dairy, allowing one dollar and twenty-five cents a day of ten hours, it would cost fifteen dollars and sixteen cents a year in time, to weigh the milk of every cow at each

milking, a trifle more than one dollar and fifty cents per cow for the year. Wouldn't it be worth many times that amount to you to know when a cow was costing you money, in feed and care, instead of returning you a profit? It seems so simple but it is so hard to convince farmers of its great usefulness. This weighing of the milk,—they call it "a waste of time." It is a wicked waste of time, money and effort not to do it, and the Babcock plays just as important a part if you make butter. You can get one for five dollars and you can know which cow gives you 4 per cent and which 3.8 per cent and which 5 per cent. Isn't that worth while?

We have naturally a beautiful and bountiful state, we can have good cattle and we can feed and rear them for profitable production if we will set about it in the right way. Grow silage corn, grow oats and grind them; grow any hay but Timothy; use good bulls, a scale and a Babcock and by the time the 14th census is taken you can place Florida, Colorado and New Jersey away back in the "Ruck." And apart from the adaptability of the farm for dairying, furnishing the necessary pasture, and raising the requisite grain, fodder and clover for the stock, the dairy farmer must have a thorough knowledge of, and a love for the calling—the requisite to success.

"Economy in production" necessitates the possession of the proper machinery, in this case a cow, and a thorough understanding of how to care for and handle her so as to obtain the greatest possible product at the least cost for food consumed. Therefore don't keep cows—make the cows keep you and bring away up in the list of dairy statistics the Staunch Good Old State of Maine.

There is another and most important matter if it could only be carried out and I see no reason why not. It is the formation of "Farmers' Bureaus," throughout the state, having them closely associated with the several Boards of Trade of the cities. These farmers' bureaus can do a lot of good and there ought to be a traveling instructor to go among the dairy farmers to help stop the leaks in the Dairy Industry, that are inevitable, unless some one watches the work. It is the local, sympathetic, agricultural Instructor that we need and the demand is that he be forthcoming.

MAINE DAIRYMEN'S ASSOCIATION—ITS PURPOSE.

By LEON S. MERRILL.

I have been requested to discuss the "Maine Dairymen's Association—It's Purposes," and I do so with the feeling that this topic could have been presented with greater clearness and force by some one of the pioneer members of the association.

Seeking information on the subject we naturally turn to the constitution of the association, and here we find the following statement: "This society shall be known as the Maine Dairymen's Association, and its object shall be to improve the dairy interest of Maine in all its branches." Thus we learn that its policy was intended from the first to be broad and comprehensive. If we are to point out the specific policies for which the association has stood, the lines of action it has supported, we must search the pages of its history. If we are to give any adequate conception of what the association has accomplished during the 14 short years of its existence, we must set forth something of its inception and quite fully its official relation to progressive dairying.

ORGANIZATION.

Unquestionably the organization of the Maine Dairymen's Association had its inception in the minds of the leading dairymen of the state because dairying was not progressing either in quantity or in quality of product as rapidly as the efforts made in its behalf would seem to warrant. In an address delivered before the State Dairy Conference in 1897 a prominent member of the Board of Agriculture made the following statement: "Although the press for the last 10 years has been urging the farmers to increase in this line and the Board of Agriculture has annually expended $3,000 in holding institutes all over the state in which the main topic has been dairying, it is rather humiliating to read the report of the census of the cows of this state for the last year and find that the number has decreased 5,000. With all our efforts and all the efforts of the

press the farmers have decreased the number of their cows." In the annual report of the Board of Agriculture for 1898 the Secretary states that "from 1896 to 1898 there has been a decrease of 8,600 cows." In an address delivered before the State Dairy Conference in the same year the Secretary of the Board stated as follows: "As I look over the market conditions and observe the increasing demand for dairy products, I am inclined to the opinion that there is room for the progressive dairyman. I believe that never in the history of dairying in Maine has there been a brighter outlook for encouraging prospects, for active intelligent work, than at the present time. Ever since the first Dairy Conference was held in Maine we have been continually met with the cry of a possible overproduction of dairy goods. We occasionally have been asked by conservative people to call a halt and turn the attention of our farmers to some other line of work rather than to an increased work along dairy lines; but notwithstanding all of the work that has been done by the Board of Agriculture and by other institutions and organizations the fact remains that the quantity of butter manufactured in Maine has not kept pace with the increased demand from our people, so that today we find creameries in our state buying butter from abroad, much of it coming from the far West."

Unquestionably the realization of this situation brought about the organization of the Dairymen's Association. For several years agitation favoring an organization was kept up, and finally culminated in a meeting held in the Grange Hall at Winthrop for the purpose of forming an association. This meeting was held on the 29th day of November, 1898, and a temporary organization effected. In order that we may gather some idea of the force behind this movement, it is well to glance at the character of men in attendance at the first meeting—Hon. Z. A. Gilbert, former Secretary of Agriculture, and Agricultural Editor "Maine Farmer"; Hon. B. W. McKeen, Secretary Board of Agriculture; W. C. Whitman of the Turner Creamery; Professor G. M. Gowell; Hon. R. W. Ellis; Dr. G. M Twitchell, Editor "Maine Farmer;" J. Henry Moore, Winthrop; Charles E. Wheeler, Chesterville; F. S. Adams, Bowdoinham; Otis Meader, Albion; L. W. Dyer, Cumberland Center; and many

other well known dairymen. Hon. B. W. McKeen, Secretary Board of Agriculture, presided at the opening meeting. The following officers were elected:

President, Rutillus Alden, Winthrop.
Vice-President, W. C. Whitman, Turner.
Secretary, L. W. Dyer, Cumberland Center.
Treasurer, F. S. Adams, Bowdoinham.
Trustee, W. K. Hamlin, So. Waterford.

On adjournment it was decided to meet in Portland December 7th to complete the organization, and on that day a meeting was held, constitution and by-laws adopted and organization completed. Before we proceed to take up any definite acts of the association shall we not view hastily the attitude of prominent agricultural authorities upon the organization of this association.

In an address delivered by Professor G. M. Gowell before the State Dairy Conference in 1898 we find the following words:

"We have made another advance, and that is in our dairy association. It is something we have been talking about for a period of years, and this fall, recognizing the necessity for a means of bringing the creamerymen and the farmers together, this association was formed. Its work is to be particularly with reference to quality. It has a cream producer as its president, its secretary is a private dairyman, and its trustee to associate with the president and secretary is a creameryman, a manufacturer. Thus we have brought together these three elements that ought to work in sympathy with each other."

The Secretary of the Board of Agriculture in his annual report the same year says, "I note with pleasure the increased interest in dairying, which has led to the formation of a State Dairy Association, made up of the best and most progressive farmers of our state." So much for official recognition as to the need of the association, and now let us pass to consider how its official acts have interpreted the object as stated in the constitution.

POLICIES.

In 1899 it elected a special committee to devise means for harmonizing the dairy interests of the state. It established

and put in operation in Auburn a cream and milk testing station; it advocated the appointment of a state dairy inspector for the purpose of assisting the farmers and creamerymen of the state in the production of a better quality of dairy products.

In 1900 a special committee was appointed to secure an appropriation from the state for the purpose of aiding the Maine Dairymen's Association in holding an annual meeting and state dairy conference.

In 1901 financial aid was given the State Dairy Association by the enactment of the following law by the Legislature of that year:

"The commissioner shall—in connection with and with the aid of the state dairymen's association—annually hold a state dairymen's conference for the exhibit of dairy products and appliances wherein prizes for high merit and quality in butter and cheese may be offered, and may employ experts and lecturers to enhance dairy interests but the expenses of the same shall not exceed the sum of $500 annually."

In the light of recent events it is interesting to note the comments made upon this law by Hon. Z. A. Gilbert—a member of the committee appointed by the Dairymen's Association to secure its enactment—which can be found in the annual report of the Commissioner of Agriculture for 1904. It reads as follows: "It is thus seen by this section of the law that no question can arise between the Commissioner of Agriculture and the Dairymen's Association as to the superiority of power, rights and obligations. In arranging for the annual convention and exhibition the commissioner and the association are a joint board of managers with no distinction one over the other save that the commissioner is to pay the expenses out of the fund placed at his disposal. The law is so plain that none can misinterpret its meaning, hence no misunderstanding can arise concerning rights and responsibilities. The parties included in the specifications of the law are required to work together in carrying out the obligation left in their charge."

In 1902 the association took adverse action in relation to renovated butter, condemning it as a counterfeit and fraudulent competitor of all genuine fresh butter. It advocated the appointment of a dairy instructor whose duty should be to harmonize and make common the interests of all dairymen and

creamerymen for their mutual benefit, with instruction to butter and cheese makers at the creameries and the farm, and to instruct in and urge better methods in the production and handling of milk and cream, and a committee was appointed to secure the enactment of a bill providing for the appointment and financial support of a state dairy instructor. It took the ground that the law relating to animal feed stuffs should be so modified as to insure protection for the farmer. It declared its purpose to oppose the then "unsatisfactory and unreasonable methods of awarding prizes at state agricultural fairs." It pledged its efforts to promote the introduction of choice dairy stock and the improvement of the dairy product.

For the first time the State Dairy Conference was held under the control of the Maine Dairymen's Association and Department of Agriculture.

In 1903 the Dairymen's Association was instrumental in securing the enactment of a law authorizing the Commissioner of Agriculture to employ a state dairy expert along the lines indicated in the action of the association in 1902. In the annual report of the Commissioner of Agriculture for that year will be found the first annual report of this officer.

In 1904 it advocated the organization of a federation of agricultural associations. It advocated and pledged the support of the association to secure the teaching of agriculture in the normal schools of the state.

In 1905 it offered prizes for best essays on dairying to be competed for in 1906 by students in the College of Agriculture.

In 1906 it supported a movement for the purchase of an experimental farm, and instructed its Executive Committee to coöperate with a similar committee from the Pomological Society to secure favorable action from the Legislature. It advocated the organization of cow test associations.

In 1907, through the initiative and generosity of Dr. George M. Twitchell, it adopted the policy of offering prizes for exhibits of yellow flint corn by both men and boys.

In 1908 it recorded itself again in favor of the establishment of an experimental farm by the state, to be placed under the direction and management of the Maine Agricultural Experiment Station. It directed the executive committee to take appropriate action for securing from the Legislature an in-

creased appropriation to be expended by the Department of Agriculture for the promotion of dairy interests. It voted to offer substantial prizes for exhibits of grains at the next dairy conference.

In 1909 it began the policy of dividing its program with the Maine Creamerymen's Association, bringing about a closer coöperation between producer and manufacturer. It elected a committee to investigate the needs of the College of Agriculture in relation to dairy barns. It elected a committee to secure the herd record books of the four great dairy breeds, and store the same in the Library of the University of Maine, it being understood that they shall always be open to the people of the state for inspection. It secured an additional appropriation of $2,000, to be expended by the Department of Agriculture for dairy work. It advocated the organization of coöperative breeders' associations.

It aided in securing favorable action on the part of the Legislature for the purchase of an experimental farm. This farm was later located in the town of Monmouth, under the supervision of the Maine Agricultural Experiment Station. It secured an increase in the appropriation made for the support of the Dairymen's Association from $500 to $700 annually.

In 1910 it held a dairy meeting in each county in the state. The meetings were well attended and productive of much good. The association voted to continue these meetings during the next year, but it was found impossible to comply with these instructions on account of failure to secure the coöperation of the Department of Agriculture. The matter of dairy premiums offered by the several state fairs was taken up by the president and secretary of the association with the trustees of said fairs, and considerable revision secured. The work of the special committee on the needs of the University of Maine in relation to dairy barns was received, adopted, and the executive committee instructed to make every effort to secure favorable action on the part of the Legislature for an appropriation of at least $20,000 for the purpose of erecting new dairy barns. It took the ground that the agricultural interests of the state could best be served by a closer coöperation of the various agricultural associations, and it instructed the director of extension work of the College of Agriculture to call a conference of representa-

tives of all the various agricultural organizations for the consideration of this matter. It recommended and requested the College of Agriculture of the University of Maine to undertake farm demonstration work. It recommended that the scope of the extension work now being done by the College be enlarged as fast as possible. It recommended the establishment of minor agricultural courses in the various schools of the state.

In 1911 the association for the first time in its history held its annual meeting and exhibit independently of the Department of Agriculture, having failed to secure coöperation in any degree from the new head of the Department. It was therefore thrown upon its own resources. The membership of the association, however, came to its support, and raised a guarantee fund for the payment of bills contracted on account of the annual meeting. It is interesting to note that this meeting, held in the town of Norway, was one of the most successful meetings ever held under the auspices of the association. In the same year it participated in a conference of representatives of various agricultural organizations held for the purpose of organizing a state federation. This federation was finally organized under the name of "Maine Federation of Agricultural Associations," comprising a membership of 17 agricultural organizations and institutions. At its annual meeting it elected for the first time, representatives to that association. It also elected a visiting member to the College of Agriculture, thus placing the association in closer sympathy and coöperation with the State College of Agriculture. It took official action looking to the union of various agricultural associations in the holding of a joint exhibit each year, dividing the time equitably for program purposes. It instructed its executive committee to keep in touch with the movements now on foot to secure Federal aid in behalf of agriculture, to be expended in each state for extension work under the direction of Agricultural Colleges and to give its active support to such bill as appears to best meet the needs of the state.

It needs only a glance over the history of the association thus briefly outlined to convince the inquiring mind that the Maine Dairymen's Association has been both progressive and aggressive in its support of the dairy interest of our state. Neither has it hesitated to step out of the realms of dairy farm-

ing and support measures of broad agricultural interest. It must be recognized that the influence of an association meeting only once each year is necessarily more or less limited, but notwithstanding this and other handicaps, such as the manner in which it has derived its financial support from the state and the difficulties experienced during the past two years in securing the state aid rightfully belonging to it, it has accomplished much for the dairy interests of Maine.

Through its influence the quality of dairy products has been improved, and in consequence better prices have been received by the farmers of the state.

It has contributed to the advancement of dairy knowledge among the dairymen of Maine. From its initiative further organization of the dairy and live stock interests of the state has taken place in the forming of Cow Test Associations and Coöperative Breeders' Associations. It recognized the fact that Maine was rapidly becoming a milk and sweet cream producing state by the offering of special premiums for these products, and during each of the past four years we have had the largest exhibit of milk and sweet cream ever shown in New England. We may well say that the objects of the Maine Dairymen's Association as exemplified by its acts during the past fourteen years have been to improve the quality of Maine dairy products, to increase the profit in Maine dairy farming, to protect Maine's dairy interests, to encourage agricultural experimentation, to promote agricultural education at the College of Agriculture, in the secondary and normal schools of the state, to develop agricultural extension work under the direction of the College of Agriculture, to more efficiently organize the agricultural interests of Maine.

THE FUTURE OF DAIRYING IN MAINE.

HON. W. G. HUNTON.

The future work of this organization must be founded on the same general principles that govern all organizations that

exist for the purpose and are created to assist and promote some necessary industry that the welfare of the country demands. The dairy interest of Maine for the natural and economical conservation of soil fertility, for the converting of otherwise much waste roughage on the farm, for transforming bulky and heavy products of the soil into condensed and high priced food products, is pre-eminent. The product of the dairy is one of the necessary food products for which the ingenuity of man can as yet provide no substitute.

In the past, as has been ably shown, the association has chiefly devoted its efforts to the most pressing needs of the industry, viz: the encouragement of the manufacturing of a more uniform and better product; the handling of it in a clean and sanitary manner; the passage of adequate laws governing its sale. In fact, the chief aim of the organization has been in the interests of the consumer. Without doubt it was expected, and it has indirectly assisted the producers in increasing the consumption and the price. But when we reflect on the fact that during the life of this organization the supply has constantly been falling below the demand year by year, to the extent that if it continues ten years more in the same ratio its effect on one of the most important food products of the country will be seriously felt, it is time to interest ourselves in aiding the producers direct, and if possible ascertaining and remedying the causes which affect the natural growth of this line of agricultural work. Perhaps unwittingly we have at this meeting taken the first step in this direction. We are holding a joint meeting with another organization whose purpose it is to stimulate crop production; to encourage, if possible, the raising of more largely—and at a less cost—many of the essential grains used in the production of milk which we have purchased largely from other states, paying freight for long distances. The necessities of one may serve to stimulate the other. Through the efforts of this organization and assistance from the state a step was taken to make the individual producer better acquainted with the details of his business, that he may know where there is profit and where loss,—the price he is receiving for the products of his farm when fed to the dairy cows. Also that he might know whether there was profit in purchased feeds.

Many of the associations formed in this state for this purpose have been allowed to decline and the records become incomplete and of no value, so that it is only possible to prove by the records of individuals the production, and not the profit and loss.

I consider that the loss of an assistant State Dairy Instructor to visit the farmers to ascertain the relative cost of production is a serious one to the dairy industry of the state.

The laws which have governed and defined the work of this association have in the past brought about circumstances which materially affect its usefulness and make it apparent that in the future our legal standing must be more clearly defined. The officers of the association must have power to execute the will of the organization or the association will lose its usefulness. Its work has been and will ever be educational and its great power for good in the state will consist of our most progressive farmers, who will move as a unit with all other agricultural interests to accomplish their needs.

This association has never been so strong as today. Trouble, even as it cemented this grand nation of ours fifty years ago, has cemented the members of the association together in a bond of sympathy that has extended beyond its membership and placed it in a position to take up, in the immediate future, the work of establishing itself upon our state statute as an organization that can be trusted, that can conduct its work successfully for the promotion of this great and important industry of the state—dairying.

At the close of the addresses Mr. J. Henry Moore of Winthrop, winner of the Sweepstake prize consisting of a DeLaval separator, was called upon and gave a very interesting description of the method employed in making the sample of butter which won the prize.

CREAMERYMEN'S SESSION.

In the absence of the president of the Maine Creamerymen's Association, Mr. J. D. McEdwards, of Bangor, presided.

HOW CAN THE CREAMERYMEN BEST ASSIST THE MAINE DAIRY INTERESTS.

ELMER E. HARRIS.

Surely this subject should be handled in the superlative degree, for the best interests are those which we are to get at and consider, and we creamerymen have been selected to bring about this assistance.

Why are there any dairymen? Why are there any creamerymen, and why the farmer? Why the need among the people for what he produces? Why the need for the Agricultural College and for some one of ability and fitness who is set apart, selected from all the bright men of the state—or at least he should be—to act as Commissioner of Agriculture, to see that the best interests are put forth and carried out in a measure in all this line of work?

It seems to me that in all which I have enumerated, even down to the Commissioner of Agriculture, there should be a peculiar fitness of the man for the position he is trying to fill.

The dairyman should be deeply interested in his calling, so also the creameryman, and no less the agencies and associations of men that have for their aim the assistance they can give along this line.

Agriculture means to till the field. It is the art of rearing those plants and animals best suited to supply the wants of man. What a noble calling! and then to be set apart to assist in helping men in this calling! What an interesting field it must be in a College of Agriculture, where the aim is to lead young minds out into a fuller knowledge in this work and to bring about the best interests for all concerned.

What a high office is that of Commissioner of this art! I think that it should be placed next to that of our chief executive. Surely it is in its relation to man, for without Agriculture how would we be fed and clothed?

The dairy interests of any state are the backbone of its agriculture, and why? Because it supplies man with food, the greatest necessity for his existence. The dairy cow is our foster mother many times. The most of us do not remember when

she helped us in giving us our first start in life, and even now she daily ministers to our wants.

But I must come back to the subject assigned me. How can we as creamerymen best assist the dairy interests of our state? Probably, if there are any dairymen here, they are saying just now, "Pay us more for our product." I will admit this is very essential. Perhaps the dairyman should receive more for his efforts, and yet we must live and let live. In view of this we must strive to produce an article which will meet the demands of the market. Is it not true that there are people in our large cities seeking dairy products that are more wholesome, that can be certified to them in a measure as to their purity? Do we not stand as the middleman between the producer and consumer? Should we not use every influence to bring about the production of a cleaner article? When the dairyman is made to realize this, we have gone a long way towards helping him receive more for his product.

As Professor B. W. Rawl has said, "Three things are necessary to prevent loss in dairying: (1) cleanliness; (2) cold; keep the cream cool and sweet; and (3) deliver in good sweet condition."

I believe the prices paid our dairymen for their products compare favorably with those of other states, and also that it is due in a measure to the fact that we creamerymen make a discount for sour and otherwise defective cream. This is in accordance with the By-Laws of the Maine Creamerymen's Association, under Section 2. It reads thus:

"The purpose of this association is to promote the dairy interests and to improve whenever possible the creamery products of Maine."

Quoting from W. D. Hoard in a recent letter,—"I have seen the cheese factory, the creamery and the condensory, the three forms of coöperative work, take their rise and come to the present growth. Too many think that they are primary in their relation to the industry, whereas they are only secondary. The primal force and source of all their growth and prosperity are the dairy farmer, the dairy herd and the farm. Here is the root of the whole question: Just in proportion as a community of farmers are *dairy* farmers, giving themselves dairy thought and study, and their herds are well bred, well fed and managed,

will either the cheese factory, the creamery or the condensory, flourish and prosper. Therefore, we can readily see that the fundamental principle of their prosperity lies in promoting as much as possible the prosperity of the farmers about them."

In view of this it is easy to see what the duty of the creamery should be if it would keep alive the source of its own strength. It should so manage its share of the business as to make a profit for the patron. It must be a clean, wholesome and attractive place of butter and cream manufacture. A dirty and untidy creamery is and always will be an educator in the same direction for the producer.

It must be absolutely honest, and trustworthy, and must make special effort to inspire respect.

More and better work should be done along the line of barn and dairy inspection by the creamerymen. While much is already being done, we are handicapped by the fact that, if we turn down one patron because of undesirable conditions found, some other creamery may take his product, and so our efforts are lost. I firmly believe that we ought to have a state inspector, whose duty it should be to visit questionable places and see that they are debarred from placing their products on the market in any form whatever. This to my mind is the best way we can assist the dairyman, and our creamerymen's association can do no less than to insist upon legislation to this effect, that there shall be barn and dairy inspection.

The creamery, being the center of organized effort for any locality, can do very much to promote dairy intelligence and the true dairy spirit among its patrons in very many ways. It can become the leader of dairy thought. The creamery managers must not settle back on the idea that they have nothing to do with the fortunes of the farmers about them except to take their milk or cream, make it into the most marketable product, sell it, and pocket the earnings therefor. This view of the case would see the creamery go into decay in a great many instances. Rather than this we should strive to have the creamery take hold of its neighborhood life in an educative way, and do what we can to arouse a spirit of improvement in breeding, feeding and the management of cows. The creamery should, in a measure, become a dairy school to the locality where it exists. There the dairy industry will flourish finely.

The first class creamery will take for an important part of its work the spreading of sound dairy knowledge among its patrons. Wherever this is done we will see our question answered in the financial prosperity and profit among the farmers who support it. We must be the leaders in good works; we must have faith in the power of good ideas to transform the dull stand-pat farmer into a live, progressive patron. The information which some of our creameries are giving their patrons relative to the knowledge of bacteria found in some milk and cream, is worthy of note, when we think of the laboratory which Mr. Bradford has in his creamery at Auburn, also the work done by Mr. Henry at Pittsfield in bringing before his patrons with the use of the stereopticon lectures, a knowledge of some of the undesirable things which may exist in milk and cream under certain conditions. Many other creamerymen have done work along this line with good results.

Right here I might speak of the value of the cold storage system to the dairyman and he should be informed in a way so that he might have a popular conception of its value and not let prejudice and error lead to measures that may be harmful to and affect the whole industry, including producer, consumer and ourselves.

The creameryman should use his influence with his patrons, not to put too much stress on certain portions of the press that desire to exploit sensation rather than fact concerning the cold storage problem. I am no Socialist; it is savored so much with the desire to have as much of this world's goods as the other fellow that it makes me dislike the name. But I do like coöperation, and the creamery that has this for its aim will succeed and give satisfaction to its patrons. When they are assured that no man or number of men are receiving large dividends at their expense, they have more interest in the welfare of the creamery.

The creamerymen ought to do more in getting the patrons to coöperate in the different associations which are so helpful whenever they are tried. There is the cow testing association; what an amount of good it has done in showing to the dairyman which his brothers are, also in economizing in feed. Then there is the Live Stock Breeders' Association, supplemented by

the Bull Associations, giving new interest for each other in the work of producing better stock.

We ought to get at our patrons and find out what they are feeding, of the crops raised, and help them in securing a superior strain of seed for that crop (as ensilage corn for example) to be distributed in small quantities among the patrons. By so doing they might be able to increase their yield for the same cost. This would give them a cheaper feed, leaving more profit in the dairy business and more encouragement for keeping more cows.

We might get some to try plots of alfalfa, as has been done among our patrons with the result that a few have been led to believe that it can be grown in Maine with some degree of success.

Then there is the white-wash campaign. The creamery could purchase one or more sprayers, and with the mixture furnish it for the use of its patrons. There might be a degree of contagion about it. If one man got white-washed probably his neighbor would want to do likewise, and all this would mean much to the product. It should be done at least twice each year, as regularly as house-cleaning.

We could also help the patrons by securing working plans for silo construction and encourage their building. We might also secure a model stall, together with plans and specifications, thus helping them to remodel their tie-ups.

Our Creamerymen's Association can assist Maine's dairy interests if we support any legislation regarding any experiments that may be contemplated by our Agricultural College and Experiment Station. One which is proposed is that of breeding experiments, using the present University of Maine herd, to determine, if possible, the law of inheritance concerning milk production. Any money they may ask our Legislature for, to bring this about, should have our hearty support.

We should also assist our mother association—The Maine Dairymen's Association; also the Live Stock Breeders' Association in any legislative movement they may uphold in bringing about better facilities to provide for our experimental herds at Orono.

One thing more. We should assist in securing legislation to take agricultural education out of politics. That is, to place

the supervision of all our educational agencies and associations under men not subject to political changes, but working under some civil service plan, thus doing away with the liability of changing every two years.

Finally, as we go from here may we feel that it is good for us to have been here; may we as creamerymen go after some one concrete thing and use the follow-up system that a few of us were inspired with when we attended the special meeting of the creamerymen last winter at Orono upon invitation of Dean Merrill of the Agricultural College. This meeting, although not largely attended by creamerymen, was very helpful to those present and the hospitality received very gratifying.

As we go from this place may this be our watchword: All working together for the Maine Dairy Interest.

At the evening session a cordial invitation was extended, on behalf of the city of Lewiston, by Mr. L. C. Bateman of the Lewiston Journal, for the Maine Dairymen's and the Maine Seed Improvement Associations to hold their next annual meeting in that city.

THE SILO—CHARACTERISTICS, LOCATION, COST AND CONSTRUCTION.

By Professor R. W. Redman.

In any factory the supply of raw material largely determines the possibilities of the business. If the raw material is limited in quantity or quality, or the cost is excessive, the profit is necessarily curtailed. In the dairy business the storage of large quantities of palatable, nutritious, yet low cost feed, is fundamental for success. At the present time there is no method for storing dairy fodders equal to siloing them. A part of the ration will profitably be the dried fodders and another part the concentrates or grains; yet the silage is the greatest factor in making an economical and palatable ration.

By use of a silo, large quantities of green food may be economically stored for winter use. True it is that this same fodder could be dried, yet the drying process is expensive for many of the leaves are lost, and in the case of corn, small animals and birds frequently eat an appreciable amount, especially if the ears are at all matured. Also the labor of handling the dry fodder is nearly, if not quite, as great and many times as much storage room is required.

The building of a silo by the dairyman usually marks a great advance in the net returns from his business. The chief time for feeding silage is during the winter, when otherwise only dry feeds would be available. A secondary time for feeding silage is during those summer months when the pasture grass is short and dried. Silage will help the dairyman over this trying time, usually at a smaller expense than by the use of soiling crops.

The popularity of the silo in Maine is shown by its presence on so many farms. Its value is attested by every dairyman who keeps an account with his cows, and the majority of cow owners who keep no records believe that the silo is a necessity. Yet, notwithstanding this constant demonstration of the silo as an important part of the business equipment, there are many cattle owners who have not yet investigated silo construction. For this reason I present to you some of the phases of silo location, cost, and construction. I do not attempt to prescribe a cure-all for your feeding troubles. Neither can I tell you what it will cost to build a silo on your own farm, since conditions differ widely. The ideas and figures which I bring to you are not new. Some of them have been obtained through concerns manufacturing silo material, others from experiment station investigations, and still others from my own observation and experience in eight states of this country and two of the Canadian provinces.

SILAGE CROPS.

The principal crop for the silo is corn, though numerous other green crops have been used successfully—such as clover, oats and peas, various grasses, Japanese and German millets, soy beans, and beet tops, besides other crops which grow farther south.

DEVELOPMENT OF THE SILO.

The first silos to be constructed were merely pits dug in the earth, in which fresh vegetables and fodders were tramped. These pits were covered with earth and not infrequently weighted with stones. It is said that the first silos on the western hemisphere were used by some tribes of South American Indians to preserve fish for winter use.

The next step in the development was a rectangular room of varying proportions, but usually with the height not exceeding one of the floor dimensions. This type of silo did not prove particularly satisfactory on account of the lack of depth and hence lack of pressure, as well as because of the relatively great surface exposed to the air.

The next general class of silos was those having a greater depth than any one floor dimension. These were first rectangular or square, and the farmer often built them in a band or joint in the barn. He soon found, however, that there was a great tendency for the silage to spoil in the corners of the silo, and also for the walls to separate at the corners. He attempted to remedy this by cutting off the corners, making the octagonal silo. The round silo followed quickly, and is today, for obvious reasons, the most satisfactory type to build. It is true that today there are in Maine many square silos giving good satisfaction and possibly there are places in which it would be advisable to build them, but this does not apply to average conditions.

Advantages of a round silo over a square or rectangular one:

1. The round silo requires less lumber.
2. The round silo is easier to reinforce.
3. There is less difficulty in filling, as no corners have to be cared for.
4. The silage settles more evenly and compactly.

The materials used for building silos are:

1. Wood—(a) single thickness, stave; (b) two or more thicknesses, with air space, as King, Gurler, or Wisconsin type.
2. Stone—usually single wall.
3. Brick—either single or double wall.
4. Hollow tile.
5. Concrete—(a) monolithic or one-piece; (b) blocks.

Of these materials, stone and brick may be disregarded under most Maine conditions, for on account of the extra cost to build them another type is chosen. The cost of double wall wooden silos is nearly as much as that required to erect a concrete silo. Further, they are not as permanent, and require much more care while they do last.

A hollow tile silo can be built without the use of the forms necessary for concrete. From what few figures I have been able to gather, the expense is slightly greater than for concrete, but the silo could be built where gravel is not readily obtained. Hollow tile are worthy of further investigation.

Thus discarding these materials for the reasons named, we have staves, concrete, and concrete blocks for silo construction. Time forbids the extended discussion of all three of these, and as detailed information can be obtained from the cement companies concerning the last two we will devote the major portion of the paper to stave silos.

Before building, a man should know how large a silo he needs. Further, a consideration of the desired essentials of a silo will help him determine the material.

THE SIZE TO BUILD.

The capacity and proportions of a silo are governed by these five factors:

1. Number of cows to be fed.
2. Number of days fed.
3. Number of pounds silage fed per animal per day.
4. Depth necessary to feed each day to prevent spoiling.
5. Effect of additional depth on capacity.

The first factor needs no comment. Many of the Maine dairymen plan to feed silage from their winter silo for eight months; that is, from the middle of September to the middle of May, or 240 days. To each cow thirty or forty pounds of silage is fed each day. To prevent spoiling, about two inches should be fed off the top each day.

A deep silo holds a proportionally greater amount than one of less depth. For example, a silo 20 feet high, 14 feet in diameter, holds 51 tons, while a 30-foot silo of the same diame-

ter holds 91 tons. This is a gain of 40 tons for the additional 10 feet, while the first depth averaged only 25 1-2 tons per 10 feet.

To answer the question of size, I refer you to the following table taken from publications on silage:

TABLE I.*

RELATION OF SIZE OF SILO TO SIZE OF HERD, FED 240 DAYS.

No. Cows	Silage Consumed.	Size of Silo.
10	48 tons	10x31
12	57 tons	10x35
15	72 tons	11x36
20	96 tons	12x39
25	120 tons	13x40
30	144 tons	15x37
35	168 tons	16x38
40	192 tons	17x39
45	216 tons	18x39
50	240 tons	19x39

CAPACITY OF SILOS OF VARYING SIZES IN FEET.

	Inside Diameter of Silo in Feet.				
Depth of Silo in Ft.	10 Tons Silage	12 Tons Silage	14 Tons Silage	16 Tons Silage	18 Tons Silage
25	36	52	68	96	122
28	40	61	81	108	137
30	44	68	90	115	150
32	50	72	95	126	162
34	53	77	108	142	171
36	57	82	114	158	194

ESSENTIALS OF A GOOD SILO.

Under this heading I can do no better than to give you the substance of a report of the agricultural engineers of Iowa State College. These essentials are:

Imperviousness of the Walls.—The fundamental principle involved in preservation of silage is the retention of moisture within the silage and the exclusion of air. For this reason the silo wall must be nonporous. Moisture must be prevented from passing in.

* Mo. A. E. S.—Bul. 103.

Rigidity, Strength and Smoothness of Walls.—An ideal silo must have rigid walls. It must be strong enough to resist the bursting pressure of the silage. This acts outward in all directions as the silage settles. The friction of the silage against the wall and the weight of the wall produce a crushing action which is great near the bottom of the silo. A silo when empty should be heavy enough to stand against heavy winds. The inside of a silo wall should be reasonably smooth to permit the silage to settle freely. If the wall is not smooth, or if there are shoulders or offsets on the inside surface, air pockets will be formed and a considerable loss of silage will result.

Durability.—After due consideration to all other points of merit to be found in silos, the most desirable silo is the one that is the most durable and will give the longest term of service. The durability of a silo depends first upon its strength, and, second, on the durability of the material used in its construction. To be durable, any material must resist the action of the weather, the constant wetting and drying, freezing and thawing in the winter season, and any disintegrating action which may be due to the silage itself. Some material will disintegrate with age, and other materials suffer from rapid decay when subject to the warm, moist conditions which exist in the silo.

Care and Repair.—It is desirable that a silo require the minimum expenditure in the way of labor and material for its upkeep. A silo which must be adjusted for shrinkage and expansion is of less value than one which does not need such attention. Often this work is neglected, and loss results. Some silos must be frequently repainted in order to present a pleasing appearance. This means added expense. All parts should be equally durable and lasting. The replacement of parts which are short-lived, the substitution of new pieces for those which have become decayed or faulty for any other reason, adds materially in many cases to the cost of maintaining the silo.

Convenience.—A silo should be convenient for filling, and so arranged that the silage may be easily removed from day to day during the feeding season. The doors should be so constructed that they can be put in place and removed with the

least effort. They should permit easy access to the silo and allow the removal of the silage with the least possible amount of labor.

Portability.—There are instances where tenants and others desire a silo which may be used in one place for a time and then moved to a new location. Under such circumstances, this feature should be given due consideration.

Fire Proof Construction.—It adds materially to the value of any building to be made of fire-proof material. The importance of this feature is realized when the large annual loss from fire is taken into consideration.

Appearance.—All farm buildings should be of good appearance. This feature adds both to the attractiveness and the value of the farm. A permanent silo of neat appearance is the most desirable silo to construct, other things being equal.

Simplicity of Construction.—It is an advantage to select a silo which can either be constructed without special skilled labor, forms or tools, or can be purchased ready for erection without the aid of skilled labor.

Cost.—One of the most important features to be considered in the selection of a silo is its first cost. The silo which will furnish storage for silage at the least cost per ton is the silo to build, other points being equal.

Frost Resistance.—In Maine the winters are so severe that it is difficult to construct a frost-proof silo. The silo wall which will prevent freezing to the greatest degree is the most desirable. A roof probably does as much as the walls to prevent freezing.

Some silos are made with double walls, with an air space between, as the King silo; others have double walls of brick or concrete; wood offers considerable resistance to the escape of heat. Single wall stave silos have given good satisfaction in this state. It may be necessary to keep the outside of the silage slightly lower than the middle when feeding during cold weather, or to cover the top of the silage with blankets, or with the doors of the silo which have been taken out—usually a little thoughtful attention prevents any serious trouble from freezing. Freezing does not hurt the silage but more labor is required to take it out of the silo, and it is harder on the animals to warm the food if it is frozen.

FAILURES OF SILOS.

If the essentials of a good silo are observed in its construction, there will be but few failures. However, some silos have failed, and these have been object lessons to us. With a stave silo, sometimes the staves shrink, the hoops loosen, and unless tightened before filling, the cracks may be large enough so that air gets into the silage and allows it to spoil.

Unanchored silos are likely to blow over when empty if the hoops are not well tightened. Occasionally a silo bursts. This may be due to an excessive swelling of staves, to lack of reinforcement, or an accumulation of juice from immature silage. If crops containing a large amount of juice—as refuse from a pea cannery—are to be used for silage, a drain should be provided in the bottom of the silo to remove excessive moisture.

To prevent bursting, extra reinforcement should be provided in building a concrete silo, or in case of the stave silo, hoops should be larger or put nearer together. A silo may be anchored by setting pins in the concrete when the foundation is made. These may be straight and have the staves set upon them, or have rings in the upper end and the staves bolted to them.

Guys may be attached from the top of the silo to the ground. Concrete silos have vertical reinforcement set in the foundation.

Some double-walled wooden silos have lasted but a short time because insufficient ventilation was provided between the walls to allow them to dry out during the summer.

LOCATION.

Advantages of Inside Silo.—Silos are sometimes put inside of barns on account of the following advantages:

1. Some men desire to build a square silo and find that they can do so by the use of the timbers of a joint or band in the barn to support the walls.

2. A silo inside the barn should freeze less than one outside.

3. A cheaply-made silo may last longer if it is inside and not exposed to the weather.

4. When the silo is placed in the center of the barn there is less distance to move the feed.

Reasons for Outside Location.—At the present time the majority of silos are being built outside of the barn for:

1. The inside location is not an economical use of barn room. The man who is working his plant to its full capacity will need that space for storing materials which will not go into the silo.

2. The average silo usually does not need the protection of an inside location.

3. Often the inside silo is unhandy to fill, while a silo on the outside may be reached easily.

4. The location keeps the odors from the barn. Nearly every outside silo has a door between it and the barn, and if this is closed, one of the chief objections to the use of silage is removed.

The outside silo should not be over four feet from the barn, and located so that the chute or communicating passageway leads into the feeding alley. The silo should be so placed in respect to other buildings that there is room to run the ensilage cutter and for teams to reach the cutter with their loads.

COST.

Stave Silos.—The figures on the cost of stave silos are very unsatisfactory for comparison with the other estimates, for the reason that the labor of erecting and the cost of foundations are not figured. Further, while I have written nearly all of the companies who are selling many stave silos, only one concern has given me prices in such shape that they can be used here.

These silos are made with splines between the staves, and metal splines are used if staves are pieced. These prices do not include roof, foundation, nor labor for erecting.

SIZES AND PRICES OF ROUND SILOS.

2-in. white pine	Approximate weight	Diameter feet	Height feet	Listed Capacity tons
$69.86	2,000	8	20	18
73.40	2,300	9	20	23
129.71	3,800	10	30	42
142.39	4,200	11	30	51
155.40	4,600	12	30	60
167.09	5,000	13	30	72
179.73	5,300	14	30	86
218.81	6,400	14	36	103
234.00	7,100	15	36	116
276.44	8,100	16	40	147
310.97	9,100	18	40	186
351.19	10,100	20	40	233
440.09	12,600	20	50	300

2-in. spruce, 5 per cent less than white pine.

PRICE OF CONICAL SILO COVERS.

Diameter feet	Weight	Price
8	195	$16 95
9	225	19 91
10	425	22 55
11	500	25 81
12	575	28 88
13	650	32 65
14	750	36 34
15	875	39 77
16	1000	44 32
18	1125	54 08
20	1450	65 56

Estimates for foundations as given by agricultural engineers vary from $15 to $135, and for labor from $16 to $125.

As previously stated, the amount of material required for the foundation and floor varies with soil conditions. The following estimate has been given for cement, for substantial work, where the whole foundation is concrete: Silo 8 feet in diameter, 2 1-2 barrels cement; 16 feet, 6 1-2 barrels; 20 feet, 9 barrels.

STONE SILOS.

The cost for stone silos varies with the distance which the material has to be hauled, the size of the stone, also the size of the silo. A silo large enough to accommodate 15 cows will probably cost about $400. This according to the Wisconsin Agricultural Experiment Station is greater than the cost for the same size silo of any other make excepting iron silos.

The figures for brick silos were furnished by the Iowa Experiment Station (Bulletin 100), and are based upon the following cost: Brick, $8 per M.; mason, $4 per day; helpers, $2 per day.

Single Wall Silo: 14 feet in diameter, $9 per foot of height; 16 feet in diameter, $10 per foot of height; 18 feet in diameter, $11.50 per foot of height.

Double Wall Silo: 14 feet in diameter, $13 per foot of height; 16 feet in diameter, $14 per foot in height; 18 feet in diameter, $16 per foot in height.

HOLLOW TILE.

These are used to some extent for silo building and probably will be used more in the future. I have been unable to obtain figures as to cost applicable to New England.

CONCRETE SILOS.

Actual cost of any number of concrete silos is as difficult to obtain as for stave silos for much of the labor of erection is done by the men on the farm and no account of time kept. Estimates from several states indicate a total cost of $2.50 to $3.00 per ton capacity for silos holding 90 to 120 tons. These figures are not exact. Concrete block silos seem to cost slightly more in total expense but more of the labor can be done by the ordinary farm help.

This means that monolithic (or solid wall) concrete silo of 100 tons capacity should cost $250 to $300.

The cost of any silos for any specific location can only be determined by the dairymen by securing estimates for his particular conditions and for the silo he desires. All silo companies and many cement dealers will cheerfully assist in determining cost.

CONSTRUCTION.

It is necessary to establish a foundation below the frost line. Usually it is not advisable to go over 6 feet below the surface of the ground on account of the extra labor required to throw the silage out. Also the cost of construction at a greater depth is often more than that for the additional height. If the ground is hard and firm, a footing 2 feet wide by 1 foot deep will be sufficient to support the weight of the walls; but if the soil is soft or loose, it may be necessary to make a footing 3 or 4 feet wide. If a chute is to be used, a footing should be provided for it when the foundation for the walls is being put in.

Unless good drainage is natural to the location, tile should be laid to conduct the water away from the foundation of the silo. It may be necessary to put cinders, 3 in. to 6 in. deep, under the floor, in order that the water which seeps under the silo may reach the tile laid around the outside of the foundation.

FORMS.

If a heavy clay soil, a form will not be required for a foundation, but if the soil is somewhat light, it may be necessary to use heavy building paper or tarred paper to line the trenches; if the soil is still lighter and has a tendency to cave in, boards will need to be bent around some stakes to serve as forms. A satisfactory mixture for foundation is one sack of cement to three cubic feet of coarse, sharp sand, to five cubic feet of screened gravel.

FLOORS.

The floor may be made of the same mixture as the foundation. If the silo is likely to be filled with immature crops or crops containing large amount of water, as refuse from a pea cannery, it would be necessary to provide for a drain, which should be laid at this time. This drain should have a trap in it so that air will not come up through it to allow decomposition of the silage. It should be provided on top with a screen, so that the silage will not go down through.

A floor is not really a necessity, provided the soil is well drained and rats do not burrow through to get into the silage. A floor cleans easier than the earth, and will care for the two above-mentioned troubles. A floor 5 in. thick, with a pitch of 1-4 in. to 1 in., gives good satisfaction. The floor supports the great weight of the silage, but this weight is evenly distributed, so that a heavier floor is not required.

FOUNDATION WALL.

If the silo is to be made of concrete, the foundation wall may be the same thickness as the walls of the silo; that is, 6 in. to 8 in. If not a concrete superstructure, 6 in. to 12 in. will be sufficient for the walls. If this wall comes above the surface of the ground (it usually does), reinforcement must be provided. This reinforcement may be of wire or iron rods, depending upon the size of the silo. These data may be obtained from the cement companies or dealers when purchasing cement for the foundation. If a concrete or stone silo is to be built, vertical reinforcement rods should be placed in the foundation; if a stave silo is being built, eye bolts should be placed in the concrete so that the silo may be anchored.

The foundation may be made of other material than concrete, such as stone, brick, hollow tile filled with concrete, or concrete blocks. These are used according to conditions.

STAVE SILO.

Any substantial weather-resisting lumber can be made into a good silo. The following woods are used for staves: Cypress, white pine, cedar, redwood, tamarack, long leaf southern pine, spruce, and sometimes even hemlock. The Bureau of Forrestry, U. S. Department of Agriculture, makes the following statement regarding the average number of years wood will remain without decay (Mo. A. E. S. B. 103):

TABLE VI.

Species	Ave. No. Yrs. Life Untreated
Cypress	14
Redwood	14
Douglas fir	10
Yellow pine	8
White pine	8

Dipping in or painting with a preservative is recommended and many silo companies furnish such preservatives or treat the lumber by dipping before it is shipped. Coal tar preservatives can usually be purchased from dealers in any of the larger towns.

Directions for the erection of patented stave silos are usually sent with these silos. Each piece of lumber is usually numbered so that the farmer should have no great difficulty in putting the silo together.

THE HOME MADE SILO.

In conclusion, I am going to tell you about building a home-made silo—a silo for the small dairyman who is trying to get on his feet. It is true that this silo may cost more in the end than a permanent structure of concrete might cost. It may represent as many dollars invested as would a patented stave silo, but it does not call for the actual cash outlay.

My attention was called to this home-made stave silo several years ago by a dairyman in Penobscot county. While the silo may not be very long lived, especially if placed outdoors, it has given sufficient satisfaction so others have been built in the same neighborhood.

A silo 12 feet in diameter and 20 feet high needs 10 hoops of 5-8-inch round iron. This means 10 holes in each side of the door frame and 20 holes in the post at the back. The hoops are made in two sections each, threaded for 6 inches on each end. The door frame and middle post are stood in place on the foundation and held by braces. Two or three hoops are put in place, the staves stood up inside, and fastened by cleats of laths or barrel staves. The other hoops are put in and all tightened.

For lumber.—This 12 x 20 ft. silo requires 105 staves 4 inches wide and 20 feet high, three 6 x 6 in. x 20 ft. posts, two 6 x 6

in. x 22 ft., and about 75 feet of 1-in. boards. The door is made of pieces of 1-in. board, which are 4 inches longer than the width of the doorway, this latter being usually 18 inches. Two thicknesses of 1-in. board are used with a layer of building paper between, taking care these pieces of board break joints.

The objection to this type of silo is lack of permanence and the amount of care it requires. As the staves are square, they touch only on the inner corners. This leaves cracks outside where decay starts. The silo dries during the summer, and the hoops must be tightened to keep it from falling down. In spite of these two obections, this type of silo will serve to help the struggling dairyman to put up ensilage for his cows. He may be able to get on his feet by using such a silo, even though it costs him more in the long run than a more durable one would, had he been able to build it in the first place.

CONCLUSION.

The silo is a business necessity for Maine dairymen. Its purpose is to preserve large quantities of succulent feed at a low cost. It should be convenient to fill and to empty. The cost varies greatly, but some kind of a practical silo is within reach of every farmer who expects his cows to return a profit.

PREMIUM AWARDS.

BUTTER.

Class I.

	Total Score.	Premium.	
Mrs. Alice J. Spofford, Greene	95	$8 00	
R. O. Jones, Winslow	93	6 00	
H. B. Whipple, Bingham	92	4 00	$18 00

Class II.

J. Henry Moore, Winthrop	97½	8 00	
Edward Evans, Waldo	97	6 00	
The Pastures, Center Belmont	96¾	4 00	18 00

Class III.

Turner Ctr. Dairying Ass'n, Auburn	97	8 00	
Skowhegan Jersey Creamery, Skowhegan	96	6 00	
Warren Creamery, Warren	95½	4 00	18 00

Class IV.

Waterford Creamery Co., So. Waterford	98	8 00	
Solon Creamery Co., Norridgewock	94	6 00	
Oxford County Creamery, So. Paris	93	4 00	18 00

Class V.

F. W. Blanchard, Cumberland Center	94	1 79	
B. W. Higgins, Levant	93	1 44	
W. W. Harmon, Woodfords	96½	2 70	
Mrs. W. S. Reed, Woolwich	94	1 79	
F. P. Blanchard, Cumberland Center	93	1 44	
J. G. Bailey, Wiscasset	93	1 44	
A. H. Stevens, West Old Town	92	1 08	
J. A. Leach & Son, E. Eddington	96	2 52	
L. Robert Chase, Bethel R. D. No. 1	92	1 08	
A. F. Dean, Portland	91	71	
Alfred King, South Paris	95	2 16	
S. G. Evans, Waldo	96	2 52	
Lakeland Farms, Sebago Lake	94	1 79	

Fernside Dairy, Norridgewock	94	1 79	
Mrs. J. D. Cleaves, Yarmouth	91	71	
J. P. Witham, New Gloucester	91	71	
Hubbard Rock's Farm, Scarboro	93	1 44	
Mrs. W. S. Whitney, Gray	90	36	
Thornhurst Farm, Falmouth Foreside	94	1 79	
S. W. Rose & Sons, Greene	93	1 44	
Mrs. C. C. Crowell, Corinna	94	1 79	
Hillside Farm, Greenville	96½	2 70	
Geo. S. Smith, Monmouth	94	1 79	
Mrs. L. H. Millspaugh, Winthrop	96	2 52	
W. E. Leland & Son, Mechanic Falls	95	2 16	
Mrs. E. E. McFarland, Palmyra	96	2 52	
I. H. Pingree, Norway	93	1 44	
Maine Creamery Ass'n, Bangor	95	2 16	
H. P. Hood & Sons, Winthrop	95	2 16	121 94

CHEESE.

Class VI.

	Total Score.	Premium.	
Mrs. S. L. Brown, Saco	97	$6 00	
Mrs. Wm. Soule, Hartland	96½	4 00	$10 00

MILK AND CREAM.

Class VIII.

MARKET MILK.

	Total Score.	Premium.
W. A. Soule, Pittsfield, R. No. 2	91	$ 88
Lakeland Farms, Sebago Lake	92¾	1 09
L. C. Lakee, Portland	92½	1 06
A. F. Dean, Portland	93¼	1 13
J. E. Pierce, Troy	92	1 00
Fred H. Bagley, Troy	92¾	1 09
L. Cornforth, Thorndike	90	75
C. A. Hatch, Unity	92½	1 06
H. P. Hood & Sons, Unity	93	1 12
Home Dairy Co., Woodfords	93¼	1 21
J. Torrey, Carmel	91	88
J. Henry Moore, Winthrop	93½	1 18
O. B. Libby, South Warren	93¼	1 15
R. O. Jones, Winslow	91½	94
J. A. Call, Carmel	87½	44
Oscar E. Burton, South Warren	93	1 12
J. A. Ness, Auburn	92¼	1 02

C. A. Knapp, Carmel	91¾	97	
L. E. McIntire, E. Waterford	92	1 00	
The Pastures, Ctr. Belmont	91¾	97	
State School for Boys, So. Portland	92¼	1 03	
B. Tucker & Son, Norway	92½	1 06	
H. W. Kimball, Carmel	90¾	84	
A. G. Hayes, Richmond	93¾	1 21	
Oscar S. Piper, Benton	92½	1 06	
Henry S. Dinsmore, Richmond	90½	81	
Chas. H. Brett, Welchville	90½	81	
Alden Blossom, Turner Center	92¼	1 03	
F. E. Young, Turner	89¼	66	
A. T. Bradford, Turner	91¾	97	
Frank J. Libby, Richmond	93	1 12	
Alfred King, South Paris	93½	1 18	
B. Cary, Turner	91½	94	
H. M. Tucker, Canton	92½	1 06	
Geo. S. Smith, Monmouth	91½	94	
A. Krueger, Brunswick	89½	69	
S. W. Crawford, Dexter	94	1 25	
Mrs. A. J. Spofford, Greene	93½	1 18	
A. D. Cummings, So. Paris	92¼	1 03	
Geo. H. Dunn, Norway	90¾	84	
C. H. Crawford, Dexter	92	1 00	
Mrs. J. D. Cleaves, Yarmouth	93½	1 18	
E. C. Patten, Topsham	93	1 12	
Smith McClure, Dover	93¾	1 21	
J. W. Hoyt, Dexter	88	51	
I. M. Boothby, Westbrook	92¾	1 09	
M. E. Parsons, Turner Center	91¾	97	
F. A. Ricker & Sons, Turner	90¾	81	
P. T. Bradford, Turner Center	91½	93	
James Shibbles, Thorndike	91	88	
I. H. Pingree, Norway	85½	20	$181 61

Class IX.

MARKET CREAM.

	Total Score.	Premium.
J. W. Packard & Son, Skowhegan	92¾	$1 52
G. W. Goodwin, Waterville	92	1 40
A. F. Dean, Portland	91	1 22
J. G. Bailey, Wiscasset	92	1 40
W. A. Soule, Pittsfield, R. D. No. 2	91½	1 30
Lakeland Farms, Sebago Lake	92	1 40
Lauriston Farms, Cornish	92½	1 48
E. C. Patten, Topsham	93¼	1 65
B. W. Higgins, Levant	90½	1 12

Home Dairy Co., Woodfords	92¾	1 52	
F. A. Ricker & Sons, Turner	92	1 40	
Tribou & Osgood, Auburn	92¾	1 52	
Alfred King, So. Paris	93¾	1 69	
J. M. Brown & Son, Solon	91¼	1 26	
W. S. Totman & Son, Brunswick	93½	1 65	
B. Tucker & Son, Norway	95	1 92	
Mrs. C. C. Crowell, Corinna	94	1 75	
I. C. Pierce, Bingham	92¾	1 52	
Oscar S. Piper, Benton	93½	1 65	
Geo. S. Smith, Monmouth	92½	1 48	
Mrs. A. J. Spofford, Greene	94	1 75	
H. M. Tucker, Canton	93½	1 65	
A. D. Cummings, So. Paris	90	1 05	
State School for Boys, So. Portland	91	1 22	
A. L. Plummer & Son, Benton Station	93	1 57	
A. L. Libby, Turner	89¼	91	
J. A. Ness, Auburn	93	1 57	
Beckwith & Taylor, Athens	93	1 57	
R. O. Jones, Winslow	93½	1 65	
G. H. Weston, Skowhegan	91	1 22	
The Pastures, Ctr. Belmont	92½	1 48	
G. L. Parker, Skowhegan	93	1 57	
Warren Creamery, South Warren	89	87	
J. Henry Moore, Winthrop	87½	60	
H. P. Hood & Sons, Winthrop	92½	1 30	$231 45

Class X.

MARKET CREAM (Pasteurized).

	Total Score.	Premium.	
H. P. Hood & Sons, Brooks	92½	$1 45	
Turner Ctr. Dairying Ass'n, Auburn	92¾	1 50	
D. Whiting & Sons, Dexter	93½	1 83	
D. Whiting & Sons, Canton	93½	1 83	
D. Whiting & Sons, Belfast	92½	1 64	
Warren Creamery, So. Warren	93½	1 83	
Solon Creamery Co., Solon	92	1 54	
D. Whiting & Sons, Pittsfield	93¾	1 78	
H. P. Hood & Sons, Belfast	94	1 93	
Skowhegan Jersey Creamery, Skowhegan	93	1 73	
M. W. Hanson, Richmond	93½	1 83	
D. Whiting & Sons, Foxcroft	89¼	1 01	
D. Whiting & Sons, Guilford	92	1 54	
Maine Creamery Ass'n, Bangor	92	1 54	
H. P. Hood & Sons, Winthrop	94¼	1 98	$24 96

$256 41

The silver cup in the dairy products judging contest was awarded to Mr. H. F. Ryder, of Auburn.

SPECIAL PREMUMS.

Lewiston Journal Special.

B. Tucker & Son, Norway (95-Class IX), one year's subscription to Saturday Journal.

J. Henry Moore, Winthrop (97½), six months' subscription to Saturday Journal.

Worcester Salt Company.

Waterford Creamery Co., South Waterford (98), $25 gold watch.

Vermont Farm Machine Company.

I.	Waterford Creamery Co., South Waterford (98).....	$5 00
II.	Edward Evans, Waldo (97).....	2 00
III.	W. W. Harmon, Woodfords (96½).....	1 00
	S. G. Evans, Waldo (96).....	1 00
	Mrs. E. E. McFarland, Palmyra (96).....	1 00
IV.	Waterford Creamery Co., South Waterford (98).....	5 00

Wells & Richardson Company.

II. Turner Center Dairying Ass'n, A. F. Tilton, Auburn (97), gold fountain pen.

Warren Creamery, Warren (95½), gold fountain pen.

H. P. Hood & Sons, E. E. Symes, Winthrop (95), gold fountain pen.

Maine Creamery Association, J. D. McEdwards, Bangor (95), gold fountain pen.

Solon Creamery Company, G. Lunt, Norridgewock (94), gold fountain pen.

Lewiston Daily Sun.

Mrs. S. L. Brown, Saco (97), six months' subscription to Lewiston Daily Sun.

S. W. Crawford, Dexter (94), one year's subscription to Lewiston Daily Sun.

SWEEPSTAKE PRIZE.

DeLaval Separator Company.

J. Henry Moore, Winthrop, (97½) No. 12 DeLaval Separator, $75.

Maine Farmer.

C. R. Leland, Mechanic Falls, 2nd place in judging contest, one year's subscription to Maine Farmer.

Russell Smith, 3rd place in judging contest, one year's subscription to Maine Farmer.

EXHIBIT OF DAIRY APPARATUS AND MACHINERY.

The exhibit of dairy apparatus and supplies was especially worthy of mention. It was not only the largest, but the most complete exhibit of the kind ever made at a Maine Dairy Conference. The city authorities turned over the large reception room in City Hall for the above purpose, and every foot of available space was occupied.

That the exhibit was appreciated the large number of interested visitors constantly in the exhibition room demonstrated.