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TENTH ANNUAL REPORT

OF THE

Illinois State

DAIRYMEN'S ASSOCIATION.

CONVENTION AT DEKALB, ILL., DEC. 12-14, 1883.

PUBLISHED BY THE ASSOCIATION.

COMPILED AND EDITED BY R. P. MCGLINCY, SECRETARY, ELGIN, ILL.

The Eleventh Annual Meeting will be held at Champaign, Ill.,
December 17, 18, 19, 1884.

ELGIN, ILL.
ADVOCATE-NEWS PRINTING AND BOOK-BINDING HOUSE.
1884.

THE ILLINOIS STATE

DAIRYMEN'S ASSOCIATION.

TENTH ANNUAL REPORT.

ORGANIZED 1873. CHARTERED 1883.

PROCEEDINGS AND DISCUSSIONS.

Compiled and Edited by R. P. McGLINCY, Secretary, Elgin, Ill.

The Eleventh Annual Meeting will be held at Champaign, Ill., December 10, 11 and 12, 1884.

ELGIN, ILL.:
THE ADVOCATE-NEWS PRINTING, PUBLISHING AND BINDING HOUSE,
14, 16 and 18 River Street.

1884.

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STANDARD QUANTITY AND QUALITY OF MILK.

QUANTITY.—Borden's standard—of eight and five-eighths pounds per gallon—is now taken and accepted as the standard for milk, not only in our own country, but in all Europe.

QUALITY.—The executive committees of the State Dairymen's Association, after many experiments carefully made, have decided that hereafter the following shall be considered by them as the standard quality of milk in Illinois: Water, 87.5; solid, 12.5—in a scale of 100 parts.

OFFICERS FOR 1884.

—o—

PRESIDENT,

DR. JOSEPH TEFFT,

Elgin, Ill.

VICE PRESIDENT,

J. H. BROOMELL,

Aurora, Ill.

SECRETARY.

R. P. McGLINCY,

Elgin, Ill.

TREASURER,

J. H. WHITE,

Aurora, Ill.

DIRECTORS,

DR. JOSEPH TEFFT, Elgin, Ill.
J. H. BROOMELL, Aurora, Ill.
C. C. BUELL, Rock Falls, Ill.
H. B. GURLER, DeKalb, Ill.
L. JOHNSON, Stillman Valley, Ill.
S. K. BARTHOLOMEW, Marengo, Ill.
C. F. MILLS, Springfield, Ill.

LIST OF MEMBERS FOR 1884.

—o—

ANDREWS, E. J., Rockford, Ill.
ADDY, GEORGE, Rogers Park, Ill.
ALLISON, A., Good Hope. Ill.
AMERICAN SALT Co., 48 Brodie St., New York City.
ARMLIN, W. W., DeKalb, Ill.
BLAKE, A., DeKalb, Ill.
BALIS, WM., St. Charles, Ill.
BARTLETT, J. P., Blackberry Station, Ill.
BARBER, W. B., DeKalb, Ill.
BARCLAY, D. F., Elgin, Ill.
BAIR, S. P., DeKalb, Ill.
BEMIS, F. W., DeKalb, Ill.
BROWN, WM., Malta, Ill.
BUELL, C. C., Rock Falls, Ill.
BROOMELL, J. H., Aurora, Ill.
BAKER, T. H., Davis Junction, Ill.
BARTHOLOMEW, S. K., Marengo, Ill.
BOSWORTH, I. C., Elgin, Ill.
CONKLYN, A. B., Earlville, Ill.
COHOON, O. S., Belvidere, Ill.
COLTON, M. W., St. Charles, Ill.
CORBETT, W W., Chicago, Ill.
CORNISH & CURTIS, Fort Atkinson, Wis.
COUNTRYMAN, NORMAN, Creston, Ill.
COLLIVER, CHAS., Galva, Ill.
COUNTRYMAN, H., Rochelle, Ill.
CREGO, PORTE, Sugar Grove, Ill.
CARTER, JAMES, DeKalb, Ill.
CALDWELL, E. S., Marengo, Ill.
CHEESEBRO, O. B., DeKalb, Ill.
CURTIS, E., DeKalb, Ill.
CHESTER, E. E., Champaign, Ill.
COLLINS, A. W., Blackberry, Ill.
CHRISTMAN, D., DeKalb, Ill.
CREGO, L. H., DeKalb, Ill.
CREGO, O. C., North Aurora, Ill.
DOUGLAS, E. G., Elgin, Ill.
DARNELLE, J., Hinckley, Ill.
DAVIS, E F., Elgin, Ill.
DRESSER, J. S., DeKalb, Ill.
DELANCEY, JOHN, Elgin, Ill.
ESTABROOK, E , DeKalb, Ill.
FARMER, E. J., DeKalb, Ill.
GLIDDEN, CHASE E., DeKalb, Ill.
GURLER, H B., DeKalb, Ill.
GARFIELD, E. E., LaFox, Ill.
GOULD, C. W., Elgin, Ill.
GIVENS, N. H., DeKalb, Ill.
GRIFFITH, HORACE, DeKalb, Ill.
GARFIELD, J. A., LaFox, Ill.
HUGG, ED, Blackberry Station, Ill.
HUNT, D. D., DeKalb, Ill.
HOARD, W. D., Fort Atkinson, Wis.
HARVEY, J. F., LaFox, Ill.
HOPKINS, J. E., DeKalb, Ill.
HOOK BROS., Union City, Ind.
HALL, F. H., Sugar Grove, Ill
HUNT, H. D., DeKalb, Ill.
HAWTHORNE BROS., Elgin, Ill.
HARKLEY, F. G., Marengo, Ill.
JOHNSON, LOVEJOY, Stillman Valley, Ill.
LEONARD, S. F., 42 LaSalle St., Chicago, Ill.
LOVE, L. D., DeKalb, Ill.
LOVELL, A., Sycamore, Ill.
LUMBARD, J. G., Star Union Line, Chicago.

LATTIN, D. B., Dekalb, Ill.
LARKIN, C. H., Elgin, Ill.
MILLS, CHAS. F. Springfield, Ill.
MOSHER, E. L., DeKalb, Ill.
MORROW, GEO. E., Champaign, Ill.
MOODY, A., Maple Park, Ill.
MASON, G. N., Erie, Whiteside Co., Ill.
MCDONALD, W. W., Elgin, Ill.
MCGLINCY, R. P., Elgin, Ill.
MOON, G. B., Batavia, Ill.
MCDOLE, R. P., Aurora, Ill.
MCCHESNEY, F. L., Geneva, Ill.
NOBLE, E., DeKalb, Ill.
NORTHRUP, S. S , Clinton Rock, Wis.
PRITCHARD, R. M., Waterman, Ill.
POTTER, WM., DeKalb, Ill.
PATTEN, S. W. DeKalb, Ill.
POTTER, L. M., LaFox, Ill.
PEMBLETON, S. S., St. Charles, Ill.
REED, O., Maple Park, Ill.
RYAN, J. A., DeKalb, Ill.
RICE, A. J.. Sodus, New York.
ROCKY, R. M., Nora, Ill.
SCHOCK & BOLANDKR, Orangeville, Ill.
STRINGER, J. T., Elgin, Ill.
STEWART, JOHN, Blackberry Sta., Ill.
STEVEN, W. W., Wheaton, Ill.
SCHOFIELD, D. C., Elgin, Ill.
TEFFT, DR. JOSEPH, Elgin, Ill.
TIMMERMAN, M. S., Sycamore, Ill.
TEFFT, THOMAS W., Elgin, Ill.
TEFFT, JONATHAN, Elgin, Ill.
THOMPSON, M. H., Elgin, Ill.
WARD, J. W., DeKalb, Ill.
WHITE, J. H., Aurora, Ill.
WILTBARGER, W. H., Waterman, Ill.
WAITE, EDWIN, Sycamore, Ill.
WILLARD & CO., C. P., Chicago, Ill.
WRIGHT, C. W., DeKalb, Ill.
WRIGHT, C. G., DeKalb, Ill.
WILLSON, D. W., Elgin, Ill.
WOOD, H., Sycamore, Ill.
WALLACE, N., Davis Junction, Ill.
WRIGHT, F., DeKalb, Ill.
WAME, G. W., Blackberry, Ill.
WELD, S. E., Elgin, Ill.
WRIGHT, S. M., Elgin, Ill.
WRIGHT, F. W., Elgin, Ill.
WELD, O. B., Elgin, Ill.

TRANSACTIONS

OF THE

TENTH ANNUAL MEETING

OF THE

ILLINOIS DAIRYMEN'S ASSOCIATION,

HELD AT

Haish's Opera House, DeKalb, Ill., on Wednesday, Thursday and Friday, December 12, 13 and 14, 1883.

The Association was called to order at 1:30 P. M., Wednesday, Dec. 12, Hon. I. V. Randall, of DeKalb, in the chair.

ADDRESS OF WELCOME.

BY REV. H. T. CLENDENNING, OF DE KALB.

Mr. Chairman, Ladies and Gentlemen of the Dairymen's Association of the State of Illinois: In behalf of the citizens of DeKalb and vicinity, it is my privilege to speak to you a few words of welcome. I rejoice in the privilege, yet enter upon it with some degree of hesitancy, for it is not always an easy thing to give expression to one's thoughts and feelings; and it is no more easy to give expression to the thoughts and feelings of others. And I am here to-day not simply to represent myself, but to represent the citizens of the town and vicinity. And yet, I want to assure you, Mr. Chairman, and members of this body, that if I shall fail to make you feel that we appreciate your gathering here in our town as an honor, and that we most cordially welcome you, I shall fail to do what I have been appointed to do, what I am expected to do, and what I have it in my heart to do.

It may seem a little strange to some of you that a Methodist preacher should have been called upon to speak words of welcome to a dairymen's association. If you were an association met together for the purpose of deliberating upon the methods of improving and multiplying choice chickens, why, of course, the appropriateness of the selection would be apparent at once; and yet, allow me to say, gentlemen and ladies, that if it be true that the profession to which I belong have the reputation of having an extreme appreciation of chickens, they will vie with any other class of men in their appreciation of good butter and choice cheese.

Political economists have divided society, I believe, into two great classes, both of which are represented here to-day. You represent one, and I have the honor to represent the other,—the producers and the consumers. Now, it may not be patent altogether to you why a representative of the latter class should be called upon to address words of welcome to a body who are, pre-eminently, the producers of the land. And yet, I beg you to allow me to suggest that, however mistaken the committee may have been in the person selected, they were right in their principle of action; for, surely, if any one should hail with delight the gathering of a dairymen's association of producers, as you are, it surely is the consumer. And, especially, it is true, since you are met together for three purposes: For deliberating, first, as to how, without greater expenditure, you may increase the quantity, improve the quality of your products, and also lessen the price. And allow me to say, as a consumer, that I am specially gratified to find that the consideration of this latter subject is to be first brought up for your consideration. Therefore, as a representative of a large class of consumers, I extend to you a most hearty welcome.

I notice upon your programme the name of his excellency, the governor of this state, toge her with many other distinguished names,—the names of men who are not directly associated with the interests you represent. And yet I am not surprised to find them here, for we are members one of another; and, in the broadest and truest sense, whatever is the interest of one class of society, is, or ought to be, the interest of all classes of society.

Society is a vast net-work of interwoven interests. All trades, all professions, all industries are very closely linked together in the inter-dependence one upon the other. We are, then, associated in a common interest when we are met together in this capacity to-day.

Society, in its complexity, is perfect; or, we may refer to this figure to show our relationship to each other. If, with the human organization, the heart may not say to the lungs, "I have no need of thee," or the hands say to the feet, "I have no need of thee;" no more can one profession say to another, or one branch of industry say to another, "I have no need of thee." Society, in its complexity, is perfect only in that which every part of society supplies.

Our homes, in their furnishings, our homes, in their ornaments and comforts, as well as in their necessities, are the productions of the four quarters of the globe. Go, to-day, into almost the humblest home that you can find, and you will find in that home that the comforts of life have been increased by the contributions of all soils and all climes. In the home of the present, the four quarters of the globe are represented. Our bread comes from the north, our apparel from the east and from the south, our teas and our coffees from Brazil, Japan, and China, and the spice of our living from the islands of the sea,—the sea, once a barrier between nations; from the recognition of the fact that we can be mutually helpful to each other, the sea that separated nations of the earth has become the highway of the world.

Our civilization of the present, of which we are so justly proud, has been developed from the recognition of the principle of the inter-dependence of one class of men upon another, one profession upon another, of one branch of industry upon another.

So then, on behalf of this oneness of interest, in view of the fact of the inter-dependence of the sons of one branch of industry upon another, I bid you welcome. It may not be improper, indeed, it will be expected by you, that I shall say a word with regard to our town into which you have come. I know that there is a great deal of wisdom in the proverb, "Let another man's lips praise thee and not thine own mouth," but you will remember that I am a Methodist preacher, and as a Methodist preacher I have no permanent residence in any city; here to-day, and perhaps there to-morrow, having only a yearly lease with only two possible renewals. So that you will not regard what I say with regard to the town into which you have come, as particularly boasting, so far as I am concerned. It seems to me eminently appropriate that this Dairymen's Convention should hold its association in DeKalb, for while we do not make any great professions as to size, we do claim a very intimate relationship to the body here assembled to-day. We do claim that, peculiarly, we are associated and allied together in all the line of inventions of the recent past, and it is doubtful whether anything has so fully met a great popular demand as the barbed wire fence. It is pre-eminently a gift to the farming community of the land; and, perhaps, some of you have heard that they claim in this town to be the patron saints of that industry. I say, then, we are peculiarly related to you, in that this is a bond of union between us. We are not large, as I said, in size; not so large as Chicago, not so large as Peoria, not so large even as Rockford, and yet, it is doubtful whether, to put it very modestly, whether there is another place of the same size in the state so widely known as DeKalb. There is not a state, there is not a territory, there is scarcely a hamlet, there is scarcely a cross-roads, throughout the length and breadth of the land, where our commodity or production is not found. Nor is it bounded even by the limits of our own country, but is carried on to South America and Europe, and even to Australia—everywhere, you find the product of the city of DeKalb. We have, in the manufacture of this barbed wire, three factories, but we sometimes fail to comprehend just how great an interest it is. I can give you only one or two facts with reference to it. I say we have three factories; one factory alone yearly sends out twelve carloads of invitations to the farming community of this land and other lands to visit our place. Think of it! Twelve carloads of invitations sent out every year by one of these factories, and this one factory alone has a capacity of producing twisted barbed wire three times faster than the ordinary passenger train runs. That is to say, that that one factory alone can produce wire enough to make a fence of three strands to encircle the globe quicker than a passenger train could go around it.

In behalf of this interest, which is peculiarly a gift to the interest represented by you, I bid you welcome.

But one word more. When Queen Elizabeth went out to dine with the Duke of Leicester, thanking him in somewhat of a melancholy mood, she said to him, "The best of a welcome is always found in the countenance of the host." And so to-day, while in this formal way I stand here to bid you welcome as an association, I trust that in our countenances, and in our appreciation of your gathering, and our appreciation of your exercises, and in the privilege which many of us hope to have of seeing you in our homes, and at our firesides and our tables, I bid you welcome.

RESPONSE.

BY R. P. McGLINCY, SECRETARY, ELGIN, ILL.

Mr. Chairman, Ladies and Gentlemen: On behalf of the Association of which I have the honor to be Secretary, I accept with pleasure the hearty and earnest words of welcome you, sir, have been pleased to tender to us to-day, and I extend to you and through you, sir, to the citizens of DeKalb city and county, our thanks for the earnest, cordial manner in which you have received us. Perhaps I might say, at this moment, that it was eminently proper that I should be selected to respond to the address of welcome delivered by a Methodist preacher. My reason for saying that is simply this, that I am the brother-in-law of a Methodist preacher; therefore, you will see that the two ought to work in harmony.

I have been entranced as I sat here and listened to the eloquent words of the gentleman in relation to this prosperous, growing, widely-advertised town of DeKalb. I know, for myself, and I think that I speak for my confrere, Dr. Tefft, when I say that we who live over the way a short distance thought that we had the boss town in the State of Illinois, and the town that was known perhaps to more people than any other town in the United States. But I find that DeKalb also has a reputation, and one of which not only her people, but the people of the whole State, ought to be proud, knowing that in the State of Illinois we are building up to-day industries that give us a world-wide reputation. I am proud of it, and I am sure that all of you gentlemen, who are not citizens of DeKalb, rejoice with me in knowing that we have such towns as this in the great and growing State of Illinois. We represent, sir, a peculiar interest—the cow interest of the state, and form an integral part of the cow interest of the United States. To-day there are, in the United States, not less than 13,000,000 of cows used for dairy purposes. Of that number, Illinois has one-thirteenth, or 1,000,000 in round numbers. We estimate the value of these cows at $35 per head, which is a very low estimate, but it will give you some idea of the vastness of this industry, which has grown up here in Northern Illinois in a very few years. Within the recollection of almost every one in this house, this industry has been developed and grown until it has reached proportions that are simply marvelous; and with your permission, I would like to give you a few figures that I have clipped from a paper, representing this great industry. It comes from authority which is unquestioned. The figures are large, but I have no doubt they are correct. "Said an officer of the Erie Milk Producers' Association, speaking to a New York reporter a few days ago, 'There are $2,000,250,000 invested in the dairying business in this country.'" All that has grown within a very few years. So far as the northwestern territory is concerned, it has all grown up within a space of twenty-five or thirty years, at most. New York, Pennsylvania, Ohio, and some of the eastern states have been longer engaged in this industry than we have. But it is within three years that Minnesota has joined the dairy states of the northwest and is now pouring her cow product into the market from that section. Dakota, Nebraska, Kansas and Missouri are following in the same steps, and adding to this grand aggregate. It is a fact, that this amount of money is almost double the money invested in banking and commercial industries. We recognize the

fact that banking and similar institutions represent a large amount of money, but when we see that we have nearly double the amount in the dairy interests of the country that there is in the banking interests, we may realize something of the importance of the interests which we represent.

Further, "It is estimated that it requires 15,000,000 cows to supply the demand for milk and its products in the United States. To feed these cows, 60,000,000 acres of land are under cultivation. The agricultural and dairy machinery and implements in use are worth over $200,000,000. The men employed in the business number 700.000"—almost as many men as were mustered into the service of the United States at any one time during the war of the rebellion—an army of 700,000 men. Now let us go further: "1,000,000 of horses. The cows and horses consume annually 30,000,000 tons of hay, nearly 90,000,000 bushels of corn meal and about the same of oat meal, 275,000,000 bushels of oats, 2,000,000 bushels of bran, and 30,000,000 bushels of corn, to say nothing of the brewers' grains and questionable feed of various kinds that is used to a great extent. It costs $40,000,000 to feed these cows and horses. The average price paid to the laborers necessary in the dairy business is probably $20 a month, amounting to $168,000,000 a year. The average cow yields about 450 gallons of milk a year, giving a total product of 6,750,000,000 gallons. Twelve cents a gallon is a fair price to estimate the value of this milk at, a total return to the dairy farmers of $910,000,000. 50 per cent. of the milk is made into cheese and butter. It takes 27 pounds of milk to make one pound of butter and about 10 pounds of milk to make one pound of cheese. There is the same amount of nutrition in three and one-half pounds of milk that there is in one pound of beef. A fat steer furnishes 50 per cent. of boneless beef, but it would require about 24,000,000 steers, weighing 1,500 pounds each, to produce the same amount of nutrition as the annual milk product does."

From these figures, gentlemen, you will see that we represent one of the grandest industries in the country, an industry that not only requires capital, but requires the highest possible skill and intelligence, because, if a man desires to succeed in this dairy interest he must be a man of intelligence.

There is no haphazard business about it. If a man trusts to luck one day, and works by science and methodical rule the second, he will have nothing to show for his work. Therefore, we have this organization, we meet in convention annually, we interchange thoughts one with the other. If any farmer has learned anything during the year, he comes up to these annual meetings and is willing to impart it to his neighbors; thus we are in a measure a mutually beneficial society, giving out and receiving from each other all necessary information to enable us to perfect ourselves in the business we have undertaken. And while I have said so much about butter and cheese, the milk products, the cows and the steers in this country, let me say that if we should add another item of production, one which was alluded to by the speaker, namely, chickens, we should add another sum of $400,000,000; and what is more, very little, if any, of that product is sent abroad. We consume it all within our own territory. Of our butter and cheese we have built up, not only a national, but a world-wide reputation; and Illinois butter to-day, whether made in the county of DeKalb or the county of Kane, commands the attention of the merchants of Europe as well as in the States.

Our cheese product of the Northwest finds a ready market in Europe as well as in New York or San Francisco. No matter where we offer these products, we can and do sell them, because they have been made by men who have devoted years of study and years of patient labor and toil to perfect themselves, and put themselves in a position where they can command the highest possible prices. And, in addition to all this, we have another industry—an adjunct to the dairy business, which is bringing us a world-wide reputation—the industry of condensing milk, originally started in the east, but gradually reached the west, and now finds a permanent home at Elgin, that modest little town, which I represent. And that product finds a market, not only in the United States, or wherever the American flag floats, but wherever the English language is spoken, condensed milk is used, adding another item of profit to the dairy.

I have already intimated to you that the man who was a sluggard, and careless in his habits, could not succeed as a dairy farmer or as the manufacturer of gilt edged butter and cheese. I remember a remark dropped in my presence by the president, calling attention to the fact that certain things are not permissible in the factory or creamery; and as he has referred to that very plainly, I will not touch upon it, but leave it for him; and let me say that whatever he may say on that point, comes from the earnest conviction that he is endeavoring to impress an idea upon the audience and upon the people of the State, that will be beneficial to them in future.

Now, I don't know as I ought to occupy the time of this Association any further, in response to the words of welcome that have been extended to us. But I think I can say for every one of the strangers present, that if there is anything in DeKalb that we fail to get, it will be our own fault, because we have been assured that everything is at our disposal; and I know—at least I think I know—that there are some here who will avail themselves of the opportunity to become acquainted with the citizens of this pleasant locality, so that if they should ever, in the journey through life, stop here they would have friends to call upon.

Now sir, in conclusion, I thank you on behalf of this Association for these words of welcome.

ANNUAL ADDRESS OF THE PRESIDENT.

DR. JOSEPH TEFFT.

Ladies and Gentlemen: You will please allow me, on this tenth annual meeting of this Association, to congratulate you upon the favorable circumstances under which we have assembled this afternoon.

The year now about closing has been, financially, a prosperous one for the dairymen of our state. The early part of the present season was variable with heat, cold, and rain, the rain falling in such profusion as to seriously interfere in many parts of the state with the early planting of the maize, a cereal, much used by the dairymen to keep up the fire of life and buoyancy of the cow of his dairy during the long, cold winter of this latitude, usually expected about this season of the year.

While the corn suffered in early spring by cold and dampness of soil, and in the fall by early frosts, the grasses have received abundance of the rich

dews of heaven, and made a luxuriant growth, from which the cow has been able to obtain sufficient nutriment to give a large flow of milk, suitable for both butter and cheese making.

The winter is now being ushered in with sufficiency of good hay in store, and, where the dairymen have been considerate enough to cut up and care for their own corn stalks, which, by the way, partially supply the loss in the corn crop, containing, as they do, about 3.2 albuminoids and 45.9 carbhydrates, while the ear of corn is said to contain 23.8 of the albuminoids and 51.2 carbhydrates. The foregoing, together with a full crop of oats, which have proven to be one of the best milk-producing cereals known to the dairyman, when properly mixed with a moderate amount of corn meal. Now, if the above be correct, the dairymen of this vicinity are in a fair condition to enter upon a winter of comparative severity.

It is generally conceded that scientific researches have lagged behind with the tillers of the soil. We can but hope that it is now beginning to be discovered that its greatest mission is with the dairy farmer, or agriculturist, who stands in need of a better knowledge in this, to them, most important point in their calling. They should study to know just when and what to feed their soil to insure the best results upon a certain crop which they are about to plant on the same.

I do not presume to say that our dairy farmers are not as well posted in what they undertake to do on their farms as those of other sections of this great union, but I do most emphatically say that, at the present day, much is being, and much more may be learned, in regard to the soil, and the tillage of the same, for the various uses to which it may be put.

Now, that I may be fully understood on this subject, you will please allow me to relate a little incident which occurred under my own observation, nearly a quarter of a century ago. I had a grape vine in my garden, which grew luxuriantly and produced more or less fruit, but prone to abort. Some of the fruit decayed on the vine; others fell to the ground before maturity. This was not pleasant, and I applied to a horticulturist to learn the cause and remedy. He looked at the vine, and said there was too much foliage on it, and that by plucking some of the leaves and allowing the sun to the fruit would relieve the trouble, in his opinion. This was tried without the least improvement. Another gentleman suggested short pruning, which was also tried, with no better result than the leaf picking.

In looking up the composition of the grape, I found this fruit contained a large amount of phosphate of lime. This gave origin to a new idea, which was that the soil required phosphate of lime in order to perfect the fruit of the grape, which ultimately proved true. Acting upon this suggestion, I forked in some bone dust, and had no further abortion in the grape, the fruit being much larger and finer in quality. This idea in regard to the abortion of the grape suggested another in regard to that disease in the cow of the dairy.

Believing, as I do, that there is a much closer relation existing between the animal and vegetable kingdoms than is generally conceded, I resolved to try the bone dust on my cows, and I may here be allowed to say either that or something else has produced a most happy effect in this respect. In my judgment, this result is attributable to the use of the phosphate of lime contained in the ground bones, as I have used no other remedial agent.

One solitary experiment rarely settles a question of this magnitude beyond a doubt; therefore, I give you this for what it is worth.

My object at this time has been to invite your attention to scientific researches in regard to the soil and its production.

This would appear to be a favorable time for the increase and diffusion of dairy and agricultural knowledge.

The growth of our country demands it. Thinking, practical men, with brains, are seeking after and anxious to receive instruction; scientific men are on the alert, for the purpose of making new discoveries and clearing up what is yet unknown to the great producing world.

It is claimed that much of our wet land in Illinois contains more or less iron, frequently in the state of sulphate. Now, we not unfrequently hear the farmer say that such land does not produce well, because it is sour. Who of you have ever proven this to be a fact?

Did it ever occur to you that a very simple experiment would settle, pretty conclusively, the existence of sulphate of iron if held in aqueous solution in the soil? If an infusion of green tea, white oak bark, or other substance containing tannin, be mixed with such water, the infusion becomes at once dark colored or black; this being the case, the simple application of common quick-lime, a substance which has a stronger affinity for the sulphuric acid than the iron, will take up the acid, forming with it sulphate of lime, which is nothing more or less than gypsum. By this simple treatment of the soil, which is within the reach of almost every dairy farmer, he can change his sulphate of iron, which renders his soil unproductive, to a substance which serves to quicken and render it productive. The sulphuric acid being removed from the sulphate of iron, leaves the latter in a state of first oxide, which, on exposure to air, will, in a short time, be converted into the second or red oxide, which is not hurtful to vegetation, but, on the contrary, is frequently used by the ladies in the earth about their plants, to increase the brilliancy of the color of the flowers. There are frequently other acids in the soil connected with decaying vegetable matter. Humus is a mixture of humic, ulmic, and some other acids with decaying vegetable matter. This, at the expense of the oxygen of the air and water, forms more soluble acids, like the ulmic, acetic, lactic, crenic, mudesic, etc , among which is some carbonic. Now, is not the farmer perfectly correct in saying that his wet soil is sour? Will he not be induced to give it a moderate dose of quick-lime, to change that acidity and render it more fertile?

Before leaving this subject you will please allow me to make one suggestion which bears upon my mind with much force at the present time, which is, that you dairy farmers, located wherever you may be, organize yourselves in your respective neighborhoods into a dairy or farmers' club, for the purpose of mutual improvement and pecuniary benefit, where you may meet once a month, or oftener, as the case may be, there to discuss and familiarize yourselves with subjects pertaining to your calling. At the same time, do not forget to invite your wives, together with your daughters, and your sons, also, to meet with you and take part in the discussion. Ladies should unhesitatingly post themselves in matters connected with the daily walks of life in which their husbands are engaged, as well as the other sex, for who knows how soon the messenger of death may knock at the door and remove

the husband and father, and she be left with a family of small children, and the farm on hand to look after and manage? Prudence, at least, would dictate the necessity of her learning what she may, perchance, so soon be called to practice.

Knowledge does no honest person harm, if properly applied. Elgin started her dairy business some thirty years ago, with monthly meetings of a dairy club, which was subsequently merged into the Illinois Dairymen's Association, greatly to the loss of Elgin's dairy farmers, but, we trust, resulting in a benefit to the farmers of the state at large. The discussions in that club in those early times have been of incalculable benefit to her farmers in these latter days.

It is claimed by many that the first reliable account of butter was given by Herodotus, about 450 years before Christ, although the Bible speaks of butter of much earlier times; yet, this is questioned by not a few writers of subsequent date; therefore, we credit the Scythians with being the first real butter-makers. The original process of butter-making was simple in the extreme. A leather bag was made to hold the milk, which is reported as having been partially filled with that article, and then fastened to the caudal extremity of a horse, he being moved about to produce the churning. Perhaps, had that little sheep-legged animal, with unmistakable ears tipped heavenward, and a fine, sonorous, musical voice, which strikes the drum of the ear at half a mile or less like a thunder-clap, and with a decided disposition to use his hindermost legs, like so many drum sticks, been in use at that time, and the bag of milk been attached to his caudal extremity, and a patent right taken out at the time, it might possibly have saved the expense of the 4,000 patents on churns of this day.

At the present time our creamery butter stands high in our market places, and the dairy farmers and factorymen of Illinois should look well to their business to see that everything in connection with the dairy and manufacturing establishments are kept in the very best condition. No doubt, all will admit that milk, cream, and even butter, readily receives and takes up when in contact with unpleasant or noxious odors; and, I trust, no one for a moment will claim that good, first-class butter can be made, or put up, where such odors exist. Not only this, but it has been claimed that disease, like small-pox and typhoid fever, has been transmitted through milk standing in an infected atmosphere.

In looking over the Chicago *Journal*, a few days ago, I found the following, which, I trust, you may all have seen. Nevertheless, in my judgment, it will bear repeating. It is from the pen of Dr. Seward, a medical practitioner of Orange county, New York, which is well worth the careful thought and attention of every dairy farmer of our state. The Doctor says: "In a letter to the New York *Tribune*, in support of the theory advanced by that paper, that milk is a disease-carrier which should be carefully examined by chemists and sanitarians, in order to determine how it becomes affected with the disease-producing germs, he reports having had three cases of typhoid fever in the family of a farmer, which, he had no doubt, originated from the fact that the well from which the dairy cows were supplied had been sunk in the barn-yard. This well had become foul from drainage from the manure heap, and when it was cleaned out the men who did the work were sickened

by the stench. The above is not an isolated case," says the Doctor. "I could take you through this beautiful county of Orange, which yields the greater portion of the milk shipped to New York City, and show you similar examples by the score; and these, I regret to say, are very common among the better educated and thrifty class of farmers."

While on this subject you will please allow me to say that no strictly gilt-edged butter has, or ever can be, made in factories or rooms where smoking of tobacco is allowed. Such smoke is absorbed to a greater or less extent by the milk, cream, or butter, and it is a fact beyond controversion that such smokers have but a faint idea of the effect produced on the butter made in such a place, as their sensibilities by the use of that noxious weed are so blunted that they are incapable of detecting its injurious effect on the butter.

You may say that this is a broad assertion on my part, but let us look for a moment at what Dr. Dio Lewis says on this subject of blunted sensibility from the use of tobacco: "Within half a century," says the doctor, "no young man addicted to the use of tobacco has graduated at the head of his class in Harvard college; though five out of six have used it, the chances, you see, were five in six that a smoker would graduate at the head of his class, if tobacco does no harm. But during half a century not one victim of tobacco was able to come out ahead." Is not this a terrible stifling of sensibility? Can we afford it? But I must pass, not intending at this time and place to give you an essay on the deleterious effects of accumulating nicotine on the human system by the use of tobacco, but only to invite your attention to its baneful effects on the product of the dairy. Please give this subject your most careful thought; if I am wrong I will stand corrected; we live to learn, and learn to live.

United States Consul to Great Britain reports that in 1880 England imported $60,705,170 worth of butter. Of this amount the United States furnished only $6,250,000 worth, this being something less than one-tenth. He further says the Normans and Danes are perhaps the best butter makers in the world. The Danes supply India and the Brazils with sweet cream, unsalted butter, hermetically sealed in tin cans.

The fresh butter of Normandy commands a higher price in the London market than that made in England. Why is this? Why should the Danes and Normans be credited with better butter than the English or even our country?

We have heard it argued that the grasses of those countries were sweeter and better than ours grown on our alluvial prairie soil. I pause to ask how this can be, as the surface of the kingdom of Denmark is an almost unbroken plain, in most places but a few feet above the ocean, the soil almost wholly alluvial.

Then what shall we say of Normandy, located as she is along the side of the English channel, between forty-eight and fifty degrees north latitude?

Looking at this from our standpoint we are forced to the conclusion that the pasturage of those countries is not superior to ours. Then again we can say in regard to other food for the cow that no better cereals are produced than can be grown in our State. This holding true then, if our butter is not fully equal to the best in the markets, we must look for the trouble somewhere between the milk-pail and packing-tub, or in one or both of these.

We do not concede the point that our dairies or factories cannot produce as fine a quality of butter or cheese as any other country on the face of the globe.

But we do concede the point that we as an exporting country are sending forward much that goes under the name of butter which has but a small per cent. of first-class butter in it, and that dairymen of our country are largely suffering by such imprudence I have no doubt.

For the six months ending October 31, 1883, the United States exported butter, or what was called butter, 13,531,366 pounds, an increase over that of 1882 of 9,127,476 pounds, and of cheese we exported in 1883, 88,709,009 pounds, an excess over 1882 of 12,486,775 pounds.

In conclusion, I may be permitted to say that the Legislature of the State, near the close of its session in 1882-3, passed a law appropriating five hundred dollars per annum to aid the Illinois Dairymen's Association in compiling, publishing and distributing their reports. This apparently necessitated some change in our organization, consequently a meeting of the Association was called at Elgin, March 3d, 1883, for the purpose of making a legal organization. Heretofore we were only associated together as mutual friends with no particular reference as to legality. A meeting was held at Elgin pursuant to the call which proceeded to perfect a legal organization. The necessary papers were drawn up, signed, acknowledged and sent to the Secretary of State with the following names as Directors for the first year: S. K. Bartholomew, Marengo, McHenry county; F. W. Wright, Hanover, Cook county; C. C. Buell, Rock Falls, Whiteside county; H. B. Gurler, DeKalb, DeKalb county; J. H. Broomell, North Aurora, Kane county; G. P. Lord and Joseph Tefft, Elgin, Kane county. On return of the papers they were sent to Geneva, Kane county, for record, in accordance with the law of the State. Subsequently a meeting of the Directors was held in Elgin for the purpose of electing officers to serve for the first year. At that meeting the following named persons were elected: President, Joseph Tefft; Vice President, C. C. Buell; Secretary, R. P. McGlincy; Treasurer, J. F. Coe.

On the third day of March next the time for which the Board of Directors and officers were elected to serve will expire, and as our annual meeting is fixed for December, and that being the most convenient and proper time for the election to take place, it is thought that the best course to pursue, (as a number of the Directors and officers have already tendered their resignations), would be if the entire Board of Directors and officers choose to resign for the purpose of electing those who shall hold their office until the next annual meeting, such resignation would most likely be accepted, and thereby leave the members of this Association free to elect whomsoever they may wish to serve them for the ensuing year.

Prior to the election it would appear eminently proper for the Association to adopt a code of by-laws for its future government.

[Dr. Tefft, at the close of his address, assumed the chair, and presided over the deliberations of the association.]

MR. C. C. BUELL: If a motion would be in order, I would move that that part of the president's address which relates to the election of officers be referred to a committee, to report at as early an hour as practicable. Carried, and the chair appointed J. G. Lumbard, J. H. Broomell, and H. B. Gurler as such committee.

Committee on Membership, consisting of J. H. White, J. P. Bartlett, and W. W. McDonald, was appointed by the President.

"SOME LESSONS IN FINANCE, FOR THE CREAMERY PATRON."

BY C. C. BUELL, OF ROCK FALLS, ILL.

Any business, to be permanent, must make reasonable returns for the capital employed, and give fair compensation for the labor bestowed upon it, otherwise it will be abandoned; or, if continued at all, it will be done under the protest of economic law. In addition to the ordinary circumstances attaching to business enterprise, the creamery business is essentially and peculiarly co-operative. It thrives with the thrift of all concerned—owner and patrons. It fails only with loss to all. The conditions of success, therefore, to the patrons, are included in the conditions of success to the creamery, and *vica versa*.

The object of this paper is to suggest some of these conditions, and some of the instances of violation of them.

It is hardly necessary to discuss the case in which peculiarity of soil or climate, the greater profitableness of some other kind of industry, or other reason, would so restrict the size and number of dairy herds as to make the locality a barren dairy region. Notwithstanding the brilliant achievements of the dairy industry, it is safe to say that it may not be profitable in any and every locality. Given the soil, the climate, the water, the people intelligent and disposed toward the exacting duties of this business, there are still many questions to be considered and many mistakes to be avoided.

It has been the pet idea in this country that competition is the corrective of all industrial evils. Competition, without doubt, holds an important place among the industrial forces, but may be carried so far as to defeat the very objects it is adapted to subserve, when intelligently encouraged. Carried to the extent of employing two persons or more to do the work of one, of absorbing capital without the full employment of it, becomes destructive and expensive. We find, for instance, in many towns, a large number of commercial establishments doing business at an immense profit on single transactions, but, the transactions are so few and so divided up among struggling competitors, that neither secures a profitable or even a respectable business. With choice cuts of meat, from twelve to eighteen cents a pound, and butchers' stock at three and four cents, we often see butcher shops multiply, but the price of meat usually remains the same. Indeed, the very increase of middle-man establishments beyond the employment of these to their full capacity, and the consequent full utilization of the capital and labor employed is a sure loss to somebody, and, if it does not all go to the producer, it is almost always shared by him.

One of the greatest burdens which the creamery business has to carry today is the excessive number of its creameries beyond legitimate demands. The co-operative idea, so far as it enters into this business, implies the most profitable use possible of the resources employed in it, both of patron and creamery owner, and a fair and equitable distribution of the profits. Said a large creamery owner to me, recently: "I find the comparative value of my

butter steadily decreasing from year to year. I have same territory, the same butter-makers, and the same patrons substantially, but my butter is not up in quality and price as it used to be. I ascribe it to the excessive competition prevailing; i. e., it is one of its results. I have lost my influence over patrons in securing the best quality of cream. If I make any criticisms of their modes and practices, they say to me: 'Mr. ——, if you don't want my cream, I will let the other creamery have it. Do just as you like about it. Take it or leave it.'" But the loss of one or two cents a pound on the net proceeds of a season means five or ten per cent. of its value; or, of the entire season's results, enough difference to make any community in a few years rich or poor, thrifty or unthrifty, according to the circumstances in the case.

Further, the idea of co-operation implies the doing of equal and exact justice to all included within the co-operative limits. This, an excessive and unprincipled competition greatly interferes with. It can properly be demanded by every fair and honest patron of a creamery that every other patron should be as fair and honest as himself. Indeed, this is an essential part of the implied contract. But in the case of excessive competition no restraints can be imposed, and no penalty can be made to follow attempts to violate the principles of equity, except the possible inconvenience of changing from one creamery to another. The straight and honorable patron is powerless; the owner of the creamery is powerless; and the co-operative element is rendered a nullity.

Further the co-operative element in the relation of creamery and patrons requires that the price of milk or cream shall vary with the market price of the finished product. Contracts for the future are mere speculation as a rule. If the transaction is large and the turn of the market unfavorable to the creamery, ruin is liable to come to the business and loss and disaster follow to all concerned. If the turn of the market should be the other way, among the numerous patrons there is sure to be more or less dissatisfaction and a more or less breaking up of the condition of friendly reciprocity which should subsist between creamery and patron. Patrons may damage their own interests by exacting too much from the creamery as well as by accepting too little, and a greedy grasping after an unreasonable share of the profit on the part of the creamery owner is sure to bring retaliation, disturb cordiality of feeling, and bring loss to all concerned.

The remedy for most of these evils can only come from intelligent and wise action on the part of the creamery patrons of a given locality. They should study to prevent an unseemly and extensive competition. They, as the encouraging source, will surely in the end pay the expense of it. It has been said that no people in the world enjoy paying taxes like Americans, provided they are only indirect, sugar-coated with some plausible pretense. It would seem, however, that even American dairymen could see that the maintenance of superfluous creameries, superfluous teams for hauling cream and milk, superfluous men for manufacturing and handling the product, is an extra expense of which they will surely bear their full share; if not at once, they will do so before the outcome is reached.

Another thing the patrons of creameries may properly take note of is that the expense of manufacturing butter in all well-regulated creameries is nearly the same, and the value of the product does not widely differ. When

a creamery therefore claims large and peculiar advantages, and offers a price for milk or cream markedly above the ordinary price paid for it by other creameries, you may be sure there is something illegitimate about it. It may be done to drum up business, to beat a rival, or it may be a downright swindle. It surely will not be lasting, and the operator intends at some time to *recoup* for himself.

It is to be remembered that the dairy business is not one which can be taken up and laid down hastily without greater or less inconvenience, expense or loss. Like most other branches of agriculture, it must be engaged in with the purpose of a steady, long, strong pull in order to be a success. It has the advantage of springing directly from the earth without fictitious help, props, or governmental protection, so called. It taxes no other industry for its own benefit and has expanded to its present magnificent proportions in spite of the burdens laid upon it from outside sources.

But it is written, "And Satan came also." Nothing could more aptly describe the full influence of adulteration which has come upon this industry. It has come clothed in deceit and fraud, the very habiliments of the devil. It can be exterminated no more than sin itself. It must be fought by exposing its nature; by stamping upon it its own features. Wise legislation I believe will be in the direction of government inspection and the sure and prompt punishment of fraud. The interest of the creamery patron is more deeply involved in this matter than that of any other class, just as in other branches of production the perils and losses by fraud, deterioration and adulteration ultimately fall back upon the producer of the raw product. The apathy now existing among the producers of milk and cream is ominous of evil and discouraging to those who are working in the interest of unadulterated goods. We have no doubt that the time will come when not only the adulteration of butter, but the adulteration of other food products as well, will only be carried on under the stamp and inspection of government supervision.

The thoughts I have presented are intended to be suggestive rather than dogmatic, and I leave the subject with the hope that the intelligence of the average dairyman may be as active in tracing and comprehending the subtler principles of trade and commerce relating to the products of his labor as it is in comprehending the more immediate facts of his calling, such as breeding, feeding and the handling of the raw products of his herd.

MISCELLANEOUS MATTERS.

S. S. NORTHRUP, of Wisconsin: *Mr. President*, you, in your address, mentioned the matter of feeding bone dust to cows. I wish you would explain how you feed that—in what proportion?

THE PRESIDENT: About five or six years ago, I lost about sixty cows in my herd from that disease which sometimes prevails among cows, spoken of, and the thought occurred to me, from its effect on the grape, that ground bone dust might help my cows. I obtained some bone dust from Chicago, by the barrel, and I commenced feeding my cows a double spoonful ground fine and mixed with bran, twice a week; and I have continued that to this time, with the loss of a cow only now and then. I don't know that it was the bone dust; I fed the same feed as before—corn meal, oats and bran with hay.

MR. GURLER: Let me say I gathered this idea from Dr. Tefft. Last year I had thirty-five out of sixty cows abort; this year I followed out this suggestion and only had two. I might say I took one-fourth bone meal and three-fourths salt, mixed them and put it where the cows could get what they wanted.

T. H. BAKER: My experience had been very similar to Dr. Tefft's and Mr. Gurler's; having considerable trouble this way two years ago, I began using bone dust, and have had very little trouble since.

O. REED: I would like to ask these gentlemen this question,—Do you think it best to keep these aborting cows?

MR. GURLER: I turned off last year the majority of the cows that aborted, and I am sorry that I didn't turn off every one of them. The balance of them have got to come to it finally. They are simply aborting farrow cows and they don't pay.

MAJOR H. E. ALVORD, N. Y.: It seems to me important on this point to know the value of the cow. Certainly I wouldn't dispose of my best cow if she aborted once or twice in succession. I have had unfortunate experiences in this direction. I have not fed bone dust or altered my treatment of the animal in the least, nor have I disposed of a single one, and the disposition to abort is passing out of the herd. I believe it is largely epidemic and a matter that will pass away with patience, although I would not suggest that there may not be precautions and remedies; but I would not give up an animal simply because she aborts once or twice.

THE PRESIDENT: I have had more or less trouble with those cows bringing forth calves after aborting, still I have kept some of them. I believe the loss of phosphates in the pasture is the trouble, just as it was in my grapes. While Mr. Alvord may be in a section where he gets the phosphates replenished in some other way, we here do not get them as readily, and therefore the lack must be supplied to the cow, and in my judgment it will relieve this difficulty. I prefer to take this method of feeding direct to the cow, rather than by feeding my land. Mr. Dole, of Crystal lake, asked me for information on this matter some two years ago. I told him what I had done and he sent to Chicago and purchased some bone dust and sowed it over his pasture, and also fed his cows with it. I was there last year and was told that he had lost but one cow since he sowed it on the land, and that was one cow that had no bone dust.

MR. RICE, of N. Y.: I came here hoping to learn as much as possible of the cream gathering system, and if the subject is of interest, I should be glad to ask Mr. Buell the comparative results to the farmer, supposing that the manufacturer gets equal profit in each case?

MR. BUELL: That question has been quite fully discussed in our Northwestern Association and other places, and I do not know that I can throw any new light on it. I think that the answer must necessarily be conditional. That in some localities, without doubt, the system of cream gathering is more profitable; for instance, in the locality in which I live, the whole milk system could not be sustained at all; there couldn't milk enough be secured to operate a factory; we want our milk for our pigs; and it wouldn't be possible to sustain a milk gathering creamery in that locality. In other localities where the dairies are large, and where a large amount of milk could

be secured within a reasonable radius, the case might be altogether altered, and it would depend there, I think, largely upon how the farmers were disposed. My impression has always been that where abundance of milk could be secured, quite as satisfactory results could be obtained by gathering the milk as by gathering the cream, and this applies particularly to our State. Where it is necessary to cover a large territory, why, the cream gathering system, it seems to me, is a better way; it has gained a foothold here in the west, and it has come to stay, in all localities similar to those I have described.

W. W. COLTON, of St. Charles: There are gentlemen here who probably can tell us the amount of money there is in this. How much per cow does it average to the factory man when he gathers his cream in this way?

MR. BUELL: I cannot answer that question. I would simply say this, that in my locality the cream is increasing, and the industry of the farmers is tending in that direction quite decidedly. Of course no creamery man will continue to run a creamery unless he gets fair returns from it. I think this argument has some force in it—the industry is holding its own and increasing.

SECRETARY MCGLINCY: A farmer at Clarence, Iowa, stated that he was receiving $28 per cow for cream. He valued the calf at a year old at $15.

MR. COLTON: I have a friend who was looking over my books, and he asked me, "How much do your cows average?" I told him. "Well, now, is that true?" I says, "Yes, it is so much from the factory; the other stuff has nothing to do with it." He says, "My cows average me, and they come round and take the cream, $18 a head." This man's name is Roe; lives in Whiteside county.

MR. BUELL: This may be all true; I presume this gentleman lives within the limits of the Elgin Board of Trade, and enjoys all the advantages of it. That fact, and the fact that he probably lives in a locality where a large amount of milk is produced, are circumstances which enable a factory in all seasons to produce the very best quality of butter, and to sell it on the Board of Trade, besides, which is usually from one to three cents above Chicago. I desire to pay the Board all the compliment it deserves, and, I think, it is entitled to a good deal. Taking these facts into account, and the fact of the enthusiasm of the farmers of that vicinity in the care and feeding of their stock—for this man's cows in Whiteside, probably, are under the straw stacks for shelter in winter—there is a great difference. I am paying to-day 28 cents for cream, and consider myself lucky if my cream holds out. I can get as much out of that cream as a man can at home, surely, and I give him within four to six cents of what he would get if he made his butter at home and took it to the store. Yes, my teams have sometimes been out a whole day and brought in less than one hundred inches of cream. I know I can do a great deal better for them than they can do for themselves, with the same material, selling it for dairy butter, but I have to take them as I find them.

MR. BROOMELL: What can be done in Kane county and in the region tributary to Elgin—the region of which Elgin is the center—in regard to receiving profits from the cow can be done just as well in Whiteside county. That is one of the great objects, I consider, of these conventions, to try to move the milk-producing population in that direction, instead of al-

lowing them to be satisfied with pork at $4.00 and $4.50, or attempt to raise grain at prices that do not pay. Our object is to get them to see that their salvation as a farming community, and the way to raise off the debts from their farms, is in this milk-producing business; and that, instead of doing it in a half way, they should at once set themselves to work in a wholesale way. And, after they have a butter and cheese factory started near, the patronage increases, and it pays to keep milking twelve months in the year, instead of letting their cows run round the straw stacks, dry, six months in the year, and eating their heads off. The kind of a dairy that pays is the twelve months in the year dairy, and no other kind of dairy pays, and never will.

MR. RICE: In the county where I live there have been a dozen cheese factories started in fifteen years, and all of them have gone down. The farmers found they must have their milk to raise their calves. In a community of small farmers of a mixed husbandry, I believe, as Mr. Buell says, that is the locality for cream gathering.

SECRETARY MCGLINCY: This question of cream gathering is an important one. I think the gathered cream system will be introduced in the Elgin district for the reason that, within an area of fifteen miles of Elgin there are 80,000 cows, and the loss of these cows is 10 per cent per annum; 8,000 cows have got to be introduced into that section every twelve months. Our farmers do not raise their calves; they deliver their milk at the factory or ship it to Chicago, and they have nothing to feed the calves. We have to depend upon Wisconsin, Iowa, Minnesota, and counties in Illinois outside of the dairy belt to get our supplies from. Until we introduce the gathered cream system, and have the skim left for the calves, we shall have to buy. We are paying, on the average, $42.50 per head for car-load lots, for 8 000 cows a year. You can figure up where the farmer's money goes. They have largely adopted the cream gathering system through Minnesota and Iowa, because it assures them a certain amount from their cows for cream sold, and they yet have the skim milk left on the farm to feed to the calves and pigs. But I found that in portions of those states the cows were milked six months in the year; the cows were without shelter, except such as they could get on the south side of a barbed wire fence, with little feed, coming in in the spring in poor condition, so that the net profit of those cows was not as much as we would expect to get for a sheep. There must be some gentleman here who can give us some figures on this subject of gathered cream that would throw some light on it.

MR. GURLER: I would like to give a few figures. Last season, in preparing a paper for a convention similar to this, I took ten of our patrons for one week in each month, and found what they received for their cream from one hundred pounds of milk. Our business is conducted in such a way that I could tell. Our cans are 8¼ inch setters. It took three of them to make one hundred pounds of milk. I conducted my experiment very carefully. I took our whole milk dividend for each month, deducted twenty-five cents from it—fifteen cents for the difference in value of the milk with and without the cream, and ten cents for delivering the milk at the factory, before I compared it with the gathered cream, and the difference in favor of the whole milk was from 10 to 60 per cent. I think, also, that when you can get seven, eight, and nine cents for skim cheese, you cannot afford to feed it to

hogs. And here is another point: There is more to stimulate the whole milk farmer than the gathered cream farmer. They come to the factory every day, and there is a constant competition among them; they compare notes, and it sets them to weeding out their cows; they accomplish more.

MR. WHITE, of Aurora: My experience is this: That this gathered cream work has done more to educate our dairymen than all the whole milk work together.

MR. BARTLETT: How much did skim milk cheese pay when it cost two cents to make it and it was sold for 2¾ and 3 cents?

MR. GURLER: I admit that there are three months in the year that the milk is worth more at home in this section than it is to make skim cheese.

MR. LOVEJOY JOHNSON: I do not regard this as a system yet; I call it the cream gathering plan. I have been working this plan four or five years, trying to get it down to some kind of a system. I have heard this talk about the value of the skim milk until I am sick of it. Our land is worth from $50 to $75 an acre, and we cannot compete in raising calves with a country where they get land for almost nothing. Let them raise calves, and let us make butter. This gentleman speaks of the value of skim cheese this last summer. I will admit that it didn't bring a high price, but I would like to ask him how much money he made when he bought shoats last spring for his skim milk feed and sold them for four cents a pound.

MR. COLTON: There is a man in our neighborhood—and this is as true as I am going to tell you—who has thirteen cows, and in twelve months and fifteen days the thirteen cows brought in $1,335 from the factory, whole milk. Now, if the gentlemen can get that out of their cows by the gathered cream plan, I would like to have them say so.

MR. GURLER: "Figures don't lie," they say, but it always disturbs me when I hear a man bring up such figures.

MR. LOVEJOY JOHNSON: It seems to me the whole question of this cream gathering business is: Can we afford to feed cheese that is worth from five to eight cents a pound to calves and hogs? That settles the whole question. I say we can not.

MR. BUELL: The question here, I think, is not how much you can get out of a single cow, but it is how much you get out compared with what you put in. A man might get $100 out of a cow and get less profit than if he got $15. It is the net profit we want. You want to know all the circumstances before you can judge of an operation of this kind.

MR BROOMELL: Our friend, Mr. Buell, has struck the key-note when he says we want to know the credit as well as the debit side. We want to know how much those cows have consumed in order to compare it with what the man received for the milk. There cannot be any better standard than that; we must know the details. Yet, this shows what can be accomplished by good work; and what one man has done, another man can do.

MAJ. ALVORD, of New York: We have had this question with us in the east, and we are just substituting the associated dairy for the old farming dairy system; and, upon my word, I thought I was going to get lots of facts on the subject by coming from New York to Illinois; but I believe we know as much about it as you do here. Now, I know this, sir; I have figured it all out, and if I had my books I could show you facts and figures, that in sec-

tions settled similarly to our own, it costs more per pound of butter by 50 per cent, in the case of the whole milk system than it does in the case of the cream gathering system. I can show you case after case in Orange county of men who will show you by their figures that from 50 to 80 per cent. profit accrues from having the cream gathered from them, over delivering the milk of the same cows to the factories themselves. We admit that we have not made butter in the east from gathered cream that comes up to the whole milk butter, but I believe that is largely prejudice among merchants. There is another point. Our experience in the east is this, that the only way for a man to keep up and improve his herd is to raise his own calves, raise his own milch cows. That he can only do under the cream gathering system. To have a milch cow you have got to feed your calves milk sometimes. Now, something has been said about the man that made $100 per cow, as if it were an extravagant figure. Why, if in an Orange county milk producers' association a man should get on his feet and brag that he got $100 a head out of his cows, the folks would laugh at him. I can point you to dozens of herds in Orange county that would average from $95 to $125 a cow.

QUESTION: How much do you pay for making butter by the cream gathering system.

ANSWER: Usually from 3½ to 4½ cents. We haul from twenty to twenty-five miles.

MR. JOHNSON: Does your factory furnish the package, the salt, and everything at that price?

ANSWER: We ran a factory east of the Hudson river on the strictly co-operative plan. At the end of the year, as often occurs, the strict agreement fell out; it was feared there would be trouble, and our manager, who had been employed as cashier, agent or treasurer of the company, joined the butter maker. They put their heads together and agreed to take the contract for the next year, and they made butter for 3½ cents; they furnished everything and they made a living, because they renewed the contract at the end of the year. They charged 4 cents this year, however, because they found they couldn't run it for 3½ cents. Let me say that when we started a factory in Massachusetts, the cream gathering question came up. We tried the plan of taking the cream for a week at a time from some farmers whom we could depend on to make accurate returns, and we found in a very short time that the gain in price and the quantity of butter produced was considerably more in the aggregate than the whole cost; the farmers found that the factory made them 10 per cent. more butter from the same milk than they were making at home. If you go through that country, the farmers themselves will tell you that their cash income per cow is decidedly more than it was under the old system, quite a number of dollars.

The Convention adjourned to meet at 7:30 P. M.

Met pursuant to adjournment at 7:30 P. M. Song—"Are ye sleeping, Maggie?" Mr. Jules G. Lumbard.

THE RATIONAL RATION.

BY COL. T. D. CURTIS, OF SYRACUSE, NEW YORK.

No other should be given or taken. The bodies of animals and men are made up of certain elements found in nature, without a due proportion of

which the body becomes diseased. These elements are constantly used up or consumed as the functions of the animal organisms are exercised. Their waste can be supplied only through three channels—food, water and air. How important, then, that the food should be properly balanced, the water pure and taken in due proportions, and the air be pure and abundant!

But we will confine ourselves to the consideration of the *food* ration.

Science has been working on the food question, and science works for everybody. It is only necessary that we should avail ourselves of its teachings in order to get very valuable aid.

But to the German experiment stations are we mainly indebted for practical information in regard to the proper composition of foods for bovine stock. We have, however, men in our own country who are working scientifically in the same direction, and they have been able to not only confirm the principles laid down by German experimenters, but to modify the practical details in their application in this country, where results are somewhat varied by the character of both soil and climate.

I shall aim to avoid the use of technical words as much as possible; but there are certain words with the meaning of which every farmer should become acquainted, if he is not so already.

Foods may be divided into two classes—fat and heat producers, and muscle and motor producers. In the fat and heat-producers the carbons predominate, and so they are called carbonaceous, and carbohydrates or carb-hydrates. Carbon exists in a pure state in the diamond. It is nearly pure in coal, and it is the principal ingredient in wood of all kinds. When oxygen—which is the gas in the atmosphere that sustains life when we breathe it, and without which we can live but a few minutes—when oxygen unites with carbon it produces heat, and if the union is rapid enough, it produces a blaze which gives light. The final result of the union of oxygen with carbon—as with our kitchen fires and lights, and when we breathe the air—is carbonic acid gas, which permeates our atmosphere in sufficient quantities to feed and build up the entire vegetable kingdom—for carbonic acid gas is food for plants, and from it is built up the chief part of their structure. When vegetables feed on carbonic acid gas, they set the oxygen free for the use of the animal creation in breathing; and when we breathe the air, we do the very opposite—appropriate the oxygen and make carbonic acid gas for the use of plants. This mutual interchange is constantly going on between the animal and vegetable kingdoms.

Fats, oils, starches, sugars, woody fibre, and so on, are composed largely of carbon, and hence are heat producers in the animal organism when taken as food by men or animals. These, as I have said, are carbonaceous foods, and are called carb-hydrates or carbo-hydrates, which means that they are a composition of carbon and water, the water being composed largely of hydrogen, and hence the term "hydrate." Carb or carbo is a contraction of carbon, and hydrate indicates a compound in which hydrogen predominates. And hence we have carbo-hydrates, combinations of carbon and water, which when consumed as food, produce heat, or are stored away in the form of fat, as a source of future heat, which may be drawn on for keeping up the animal temperature when there is a lack of heat-producing material in the food.

The muscle and motor producing foods are known as albuminoids, or, more properly, nitrogenous foods. We say albuminoids, because albumen—of which the white of egg is a nearly pure sample—is a common form of nitrogenous foods, whether of animal or vegetable origin. We have animal albumens and vegetable albumens. The word "albumen" is derived from *albus*, the Latin for *white*. Albumen in vegetables is the "nourishing matter stored up between the embryo and integuments of the seed in many plants. It is the floury part of corn, wheat, and like grains; the oily part of poppy seeds; the fleshy part in the cocoanut," etc. Animal albumen is "a thick, viscous substance, which forms a constituent part of both animal fluids and solids." I quote these definitions for the purpose of accuracy.

Notwithstanding "albumenoids" is a term used synonymously with "nitrogenous," it does not follow that nitrogen predominates in their composition, nor even in other foods called nitrogenous. It means that there is a much larger proportion of nitrogen in them than in some other foods. Many regard albumen, casein, gelatin, and fibrin as essentially identical in composition and origin. These are sometimes called *proteins*. The white of egg, which is given as nearly pure albumen, is to all appearance, strange as it may seem, chemically identical with the poison of snakes!

The meaning of one word more, and I will come to the main purpose of this paper. We have already considered "carbonaceous" and "corbo-hydrates" as heat producers and fat depositors for future use. We have also considered "albuminoids" as one term indicating muscle and motor producing foods. The better term is "nitrogenous," as this directly indicates the real element involved—especially in motor production. It is derived from "nitrogen," which is one of the constituents of the atmosphere. The air, in its normal condition, is composed of about 4-5 nitrogen, 1-5 oxygen, and 4-10,000 carbonic acid gas, mingled with the whole of which is a variable amount of watery vapor. If these were arranged according to density or specific gravity, the watery vapor would be at the bottom, the carbonic acid gas next, oxygen third in order, and the nitrogen at the top. Supposing our atmosphere of equal density throughout, and its elements arranged in order according to gravity, beginning at the bottom, if the surface of the earth were smooth, we should have four to six inches of water, then thirteen feet of carbonic acid gas, on which would rest a mile of oxygen, supporting four miles of nitrogen. If this arrangement should be suddenly made, we would find ourselves ankle deep in water, our bodies penetrating the carbonic acid gas about five feet, with eight feet of it above us; the life-giving oxygen would be thirteen feet beyond our reach, and the nitrogen one mile and thirteen feet above us. With the first inhalation, or attempted inhalation, of carbonic acid gas, we would suddenly perish—for, however useful and invigorating carbonic acid gas and its compounds may be as food and drink, it is fatal to respiration and destructive of all combustion.

But nature has ordained a different arrangement of the gases composing the atmosphere, and in all probability it is permanent. If the atmosphere were to become perfectly at rest, it is possible arrangement according to gravity might follow. But it is not certain that the principle of capillary attraction, which enables the sponge to absorb water, would not render the present arrangement stable, for gases as well as solids and liquids are porous and probably governed by the same laws.

Of the elements we have just considered, *nitrogen* is the one with which we now have to deal. Though it constitutes four-fifths of the atmosphere which we breathe, it is not known that one atom of it is directly absorbed by us, or by the vegetable creation. Yet it is indispensable to both. It not only dilutes the oxygen, making it endurable, when without this it would soon burn us up, but by its simple presence it enables plants and animals to perform functions which would otherwise be impossible. It constitutes an important portion of animal and vegetable bodies, but all or nearly all is rendered available only through food. The vegetable gets it through the fertilizers in the soil, which are dissolved by water, and the animal, including man, gets it through eating the vegetable or eating some other animal that has eaten the vegetable.

Nitrogen is the most coquettish and shy of all the elements. It is not only the motor power, but the liberty-loving element of the universe. It is extremely cautious and reluctant about forming any sort of a union with anything; and when it forms one, it appears to do it with a sort of mental reservation and determination to break it at the first opportunity. It will not be permanently chained, and it breaks its unions without notice or ceremony. It is the explosive element in gun-powder, gun-cotton, dynamite and all explosive compounds, and it is by a kind of continuous explosion, caused by the nitrogen taken in our food in its willful struggles to free itself, that we are able to think, move, or even have a conscious being. All our mental and physical energies are dependent upon the combinations, recombinations and liberations of this element in our organism.

Thus we see the importance of the two elements—the nitrogenous as well as the carbonaceous—that we derive from our food, and the reasons for using these terms. We are kept warm by the carbonaceous, and kept in motion by the nitrogenous elements of our food—and so it is with the entire animal kingdom.

You will notice that the elements we have been considering are gaseous and atmospheric. They are the most important of any of the elements, if we measure importance by proportion. There are other essential elements derived from the soil; but these are so widely and evenly distributed, and so easily appropriated, that we need pay little attention to them. The amount of the minerals—or that portion which is derived from the earth—is easily found by reducing bodies to ashes. Burn any object, and whatever in it belongs to the air will float into the air, and whatever belongs to the earth will fall to the earth—ashes to ashes.

Conditions, too, are essential. We cannot feed carbon in the form of wood or of coal, nor nitrogen in the form of nitric acid or of nitrate of potash. All food must be soluble before it is digestible, and solubility often depends on what appears to be almost trifles. But more of this farther on.

Well, how is the farmer to tell what the composition of different foods is, and how to combine them? As I said in the beginning, science has been at work for everybody. It has been at work for him, and prepared convenient tables of analyses for his use. If you want to get them in the cheapest and most convenient form in which they have been presented, buy Prof. E. W. Stewart's recent work on "Feeding Animals." It will cost you $2, and, if intelligently studied, will prove the best investment you ever made.

The rational ration is the properly balanced ration. In round numbers, the proportion should be about as one part of nitrogen to five parts of carbon. But proportion must be varied with age and condition, and in accordance with surroundings. The food proper for summer is not proper for winter. It not only needs to be more succulent in summer, but less carbonaceous, as temperature is more easily kept up, and an excess of carbonaceous food causes fever.

The German standard ration per day, and for every thousand pounds of live weight of a milch cow, is 24 pounds of dry organic matter, which contains 2.50 pounds of nitrogenous matter and 12.90 pounds of carbonaceous matter. This is very nearly the composition of the best early-cut and properly-cured hay. Dr. Wolff compounds a daily ration as follows, for every 1,000 pounds of live weight:

12	pounds	of average meadow hay
6	"	oat straw
20	"	marigolds
25	"	brewer's grain
2	"	cotton-seed cake

This combined has a composition of 23.8 pounds of dry organic matter, containing 2.55 pounds of nitrogenous matter, and 13.00 pounds of carbonaceous matter.

For the same purpose, Prof. S. W. Johnson gives two rations. First:

20	pounds	cured corn fodder
5	"	rye straw
6	"	malt sprouts
2	"	cotton-seed meal

Second:

15	pounds	corn fodder
5	"	bran
5	"	malt sprouts
3	"	corn meal
2	"	cotton-seed meal

In feeding for milk, of course the elements of the milk must be in the food, or the cow cannot elaborate milk from it. I quote from Prof. Stewart's book the composition of 6,000 pounds of milk:

DRY SUBSTANCE.	LBS.
Casein and Albumen	234
Fat or Butter	228
Milk Sugar (in whey)	278 4
Salts or Ash	39.6
Total Dry Substance	780
Water	5,220
	6,000

I have before remarked that American experimenters have been able to modify the ration of the Germans for our use. I will quote a few, furnished by Prof. Stewart, that can be easily compounded here in the west, giving what he estimates as the average cost:

(1)

10 lbs.	clover hay	4.0 cents
10 "	straw	2.0 "
4 "	linseed oil cake	6.0 "
4 "	wheat bran	3.0 "
2 "	cotton-seed cake	2.5 "
4 "	corn meal	3.0 "
	Total cost	20.9 cents

(2)

16 lbs.	meadow hay	6.4 cents
8 "	wheat bran	6.0 "
2 "	linseed meal	3.0 "
6 "	corn meal	5.0 "
	Total cost	20.4 cents

(3)

18 lbs.	corn fodder	4.5 cents
8 "	wheat bran	6.0 "
4 "	cotton-seed meal	5.0 "
4 "	corn meal	3.0 "
	Total cost	18.5 cents

(4)

60 lbs.	corn ensilage	7.5 cents
5 "	hay	2.5 "
2 "	linseed meal	2.5 "
4 "	bran	3.0 "
	Total cost	15.5 cents

(5)

60 lbs.	clover ensilage	9.0 cents
4 "	corn meal	4.0 "
	Total cost	13.0 cents

(6)

40 lbs.	corn ensilage	5.0 cents
40 "	clover "	6.0 "
4 "	bran	3.0 "
	Total cost	14.0 cents

(7)

40 lbs.	corn ensilage	5.0 cents
40 "	clover "	6.0 "
40 "	millet "	6.0 "
	Total cost	17.0 cents

Prof. Stewart says: " Any of these rations could produce a large flow of milk and fully keep up the condition of the cow, if her live weight were not over 1,000 pounds. In many parts of the West the seventh ration would not cost more than ten cents per day. All these rations would also produce a good quality of butter in the winter. The ensilage rations are the cheapest, and would produce the largest flow of milk."

I would suggest, however, that it would be better to not have the ration all ensilage, no matter how well balanced the ration, for two reasons: First —there would be too much water, especially in winter; second—there would be too much acid for the health of the cow and the quality of the product. I should much prefer to give the cow forty pounds of corn and ensilage, and all the well-cured clover hay she would eat. This would make a well-balanced ration, and would be cheap. The dry hay would counterbalance

the water and acidity of the corn ensilage. But don't fail to let your cows have all the water they want. Prof. Horsfall found that a cow giving twenty pounds of milk a day drank forty pounds of water more than a fattening animal of exactly her weight. Although only about seventeen and one-half pounds of this extra water went into the milk, the system of the cow called for the extra forty pounds. In winter, the water which a cow drinks should not be ice-cold, but of moderate temperature, not colder than well water. Some dairymen say it pays to warm the water to blood heat.

Let me call attention to the fact that none of the feeding tables treat corn, or corn-fodder, or both combined, as a perfect food. They all supplement it with more nitrogenous food. This makes also a variety of food, which is better relished. Animals, as well as men, tire of eating one kind of food, however well-balanced it may be. The probabilities are that we cannot as yet formulate a perfect ration for man or beast, and that it is necessary to have variety in order to eliminate error from the problem. I am in favor of a much great-r variety of food for animals. If they had a wide enough range of selection they would properly balance the ration for themselves. As we do not give them this range, it is our duty to balance the ration as nearly as possible, and to preserve their food in the best possible condition.

The laws applicable to animals are just as applicable to the human race. Knowledge is not amiss in preparing our own rations. Circumstances and early treatment in childhood often pervert the appetite and give false tastes. So also those who indulge in the pleasures of the appetite are liable to create diseased and vicious appetites. The millions spent for tobacco and alcoholic drinks of all kinds show this. And it is a fact that appetites are transmitted from parents to offspring. So true is this, that the rational ration is a rare thing on the table of the average family. But science, reduced to practice, shows us that we can make ourselves fat or lean, as we please, by the kind of food we eat and fluid we drink. A Mr. Banting, of England, was five feet five inches in height, and weighed 202 pounds. In twelve months he reduced his weight to 150 pounds. Yet, he did not starve. He used beef, mutton, fish, bacon, dry toast and biscuit, poultry, game, tea, coffee, claret, and sherry in small quantities, and wound up with a nightcap of gin, whisky, brandy, or wine. He abstained from pork, veal, salmon, eels, herrings, sugar, milk, all sorts of vegetables grown underground, and nearly all fatty and farinaceous substances. Daily he drank about forty ounces of fluids. By reversing this order—eating what he abstained from and abstaining from what he ate—he could easily reverse the results, and become fat again. Such is the power of diet.

Dr. George M. Beard, in his little book on "Eating and Drinking," gives the following daily ration for the British soldier, on home duty:

12	ounces	of meat
24	"	of bread,
16	"	of potatoes,
8	"	of other vegetables,
½	"	of coffee,
0.16	"	of tea,
1.33	"	of sugar,
3.25	"	of milk,
0.25	"	of salt,
Total,	65.32	ounces.

Dr. Dobell gives four food rations, any one of which is sufficient for twenty-four hours:

No. 1.

6	ounces	of meat, poultry or game,
4	"	of fish,
10	"	of bread,
8	"	of potatoes,
2	"	of rice,
2½	"	of sugar,
2½	"	of butter,
5	"	of milk,
16	"	of coffee,
16	"	of tea,
17	"	of water,
Total, 89	ounces.	

No. 2.

18	ounces	of bread,
3½	"	of cheese,
3	"	of bacon,
1½	"	of sugar,
5	"	of milk,
20	"	of chocolate,
21	"	of tea,
20	"	of water,
Total, 92	ounces.	

No. 3.

16	ounces	of oatmeal,
22	"	of milk,
1¾	"	of butter,
0¾	"	of sugar,
49	"	of water,
Total, 89½	ounces.	

No. 4.

25	ounces	of bread,
3½	"	of cheese,
2	"	of butter,
60	"	of water,
Total, 90¼	ounces.	

Each one of these tables is supposed to contain the requisite variety and quantity of food for a vigorous, healthy man. For me, the daily ration would be pretty heavy. Very much depends on how a man is employed.

I have intimated that very much also depends on the condition of the food, as well as its variety and quality. The best potato in a raw state is indigestible, or nearly so, in the human stomach; but cook it, and few articles are more digestible. But another illustration I wish to call your attention to. I have spoken of minerals as essentials in food, and as naturally being there, so that we need not pay much attention to their supply. But if we prepare

our food so as to take these minerals out, we injure if we do not spoil it. For instance, the phosphates in cheese are very essential to its digestibility. These are the phosphates of lime, iron, soda and magnesia. The phosphate of lime constitutes nearly one half of the ash of cheese. Take these out, and the casein becomes insoluble and indigestible.

If, in the process of manufacture, we do not get the whey separated from the curd before the lactic acid develops, this acid will dissolve the phosphates, which will run out with the whey. So far as they are washed out, the cheese becomes indigestible; and so true is it that acid cuts out the phosphates, that the amount of acid the chemist finds in a cheese is a very good guide to its indigestibility. Cheese properly made is nearly all digestible, but it is frequently so mismanaged and robbed of its phosphates by the acid process that not more than ten to fifteen per cent. of it is digestible. To avoid this loss of phosphates is the object of the Arnold sweet-curd process, which has enabled the Canadians to excel us in quality and price, while some of our Bourbons have been railing at it and denouncing its author. Because some have tried to work by his process, but failing to comprehend it have not succeeded, proves nothing against it in the face of the fact that thousands have succeeded with it. If we would attain the best results, we must not overlook small things, nor be so wise in our ignorance that we will not learn.

To recapitulate, we find our food and the food of our animals must contain the needed elements of the body in due proportion, and be in proper condition for digestion and assimilation. All foods contain most of the needed elements, but not in the same proportion. There are very few perfectly or approximately balanced foods for either men or animals. In some, the amount of carbonaceous elements are in excess; in others, the nitrogenous elements, or albuminoids, are in excess. The rational ration consists of a proper balance of the two. Science can indicate how to balance the ration; but science has no control over conditions and circumstances, nor over individual idiosyncrasies. It is for the intelligent man or woman to apply the facts and principles discovered and established by science, and to keep step with the march of progress in the grand succession of the ages.

W. D. HOARD: *Ladies and Gentlemen*—I have been very highly entertained and instructed, in listening to Col. Curtis, as he has described the elements of food. He has spoken quite pointedly upon carbonic acid gas; and I wish to inquire of the Colonel, if a man allows that pestiferous gas to accumulate about his premises, does he not thereby become a carbonic gasic ass?

I wish now to give you a little statement concerning the action of this gas. It is one that afflicts almost every household in the land; it is one that is found in almost every cellar, and it is one that works the most woful action upon the health of your families and upon the character of your food.

In the city of Fort Atkinson, where I do reside, Mr. Clapp, the president of the bank, told me that for twenty years he had been unable to keep any milk or butter or common food of the family in the cellar. I went and looked at it, and saw gathered on the sleepers above large beads of moisture and then knew what was the matter. The cellar was full of foul air. I said to him, "Prof. Wilkins is here and will tell you in a few moments how to

remedy this difficulty, and make your cellar a clean and wholesome apartment of your house." I went down and got the professor, and he went up and looked at the cellar, and he says, "for ten dollars I will put you in possession of a cellar that will be clean and wholesome." He went to work and took a four-inch pipe, made of galvanized iron, soldered tightly at the joints, passing it down the side of the cellar wall until it came withing two inches of the bottom of the cellar, turned a square elbow at the top of the wall, carried it under the house, under the kitchen, up through the kitchen floor and into the kitchen chimney, about four feet above where the kitchen stovepipe entered. You know the kitchen stove in all families is in operation about three times a day. The heat from this kitchen stove acting on the column of air in that little pipe caused a vacuum, and nature abhors a vacuum, and the result was that in twenty-four hours that little pipe had drawn the entire foul air out of the cellar, and he has now a perfect cellar. I drop this hint to show you that it is within easy reach of every one, for the sum of only about ten dollars, to have a perfectly ventilated cellar. This carbonic acid gas is very heavy. It collects in the cellar and you cannot get it out unless you dip it out like water, or pump it out; and it becomes necessary to apply something to it that shall operate in this way.

As I have been sitting here, Mr. President, and looking over these faces, I have been thinking of the many weary years of hard, persistent work, that it has taken to arouse the judgment and the intellect of Illinois and the Northwest to the importance of this great dairy question. It is shown here in the interest, in the earnest attention and upturned faces of these people. In the fifteen years that I have been identified with this effort, I have seen it grow from small beginning, until it is to-day the leading agricultural interest of Illinois, Iowa, Minnesota and Wisconsin. When, in 1872, we commenced the organization of such a society in Wisconsin, we represented, all told, 6,000,000 pounds of cheese, and the total dairy products of the state were a mere bagatelle. To-day Wisconsin produces about 30,000,000 pounds of cheese, and her cows add to the value of the state a product equal to $17,000,000. These little facts, ladies and gentlemen, are at the bottom of our lives. They make it possible for us to have happier and better homes. When you add to the revenues of the farmer, if he is a man of brains, and a man of accomplishments, you have added to him a power to become more of a man, and to make of his wife and his children better adjuncts to his own being and to the welfare of society.

EFFECTS OF FOOD UPON THE CHURNING QUALITY OF MILK.

BY MAJOR HENRY E. ALVORD, OF HOUGHTON FARM, NEW YORK.

There is a simple but important lesson, often taught to the child by its father, the pupil by its teacher, and the congregation by its minister, namely, that that person is well along in his education, and ought to be happy, when he has advanced far enough to learn that he knows very little.

This certainly applies equally well to farming. Moreover, I think the occupation of the farmer, and especially the dairy farmer, is one well calcu-

lated to convince any person at an early period that man has not yet compassed all knowledge.

The very fact of these meetings of dairymen is founded upon the principle that there is much yet to learn, and our attendance confesses that we are never too old to learn. We assemble for that purpose, to compare notes, exchange ideas, discuss disputed points, and go home better educated for our business than we were before.

You will pardon a personal allusion if I say that, being a butter maker in the famous old dairy county of Orange, New York, adhering (for what I believe to be good and sufficient reasons) to the old style of private farm dairying, I am nevertheless greatly interested in the creamery or factory system of the west in its various forms, desire its extension eastward, and am here mainly to learn what I can from the essays and discussions of your meeting.

Yet in a spirit of equity I am ready, when able, to give as well as receive, and at the request of your officers will contribute my mite to subjects under consideration.

Your attention is therefore asked to a single point, but one of essential importance to butter makers. At the outset, let me disclaim any pretension to establishing or even asserting a new theory. One swallow does not make a summer, and I only desire to present a matter in the nature of a *suggestion*, asking the interest and co-operation of others in determining its truth and full import.

The subject to be briefly presented is: The effects of varied food for the cow upon the churning quality of the milk. Not the effects of food on the quantity, nor on the richness of milk, but on what I call its "churning quality."

This matter has been specially studied by me during the last year or two, from the standpoint of the practical butter maker, partly by accident, and partly through careful investigation in the dairy of the Houghton Farm—an establishment whose operations I have the responsibility to direct.

As dairymen, we probably all agree upon knowing the value of the cows we keep, as dairy animals, (if for butter, then as butter cows), and the importance of keeping the best and getting better ones. To this end we accurately test the butter-producing powers of our cows individually, and of every herd as a unit.

The richness of a cow's milk, as determined by the lactometer or measured by the visible portion of cream in the glass gauge, is no longer regarded as of value, and complete analysis, or the different chemical short-cuts for determining the actual percentage of butter fats, fail to satisfy the practical wants. It is the quantity of merchantable butter, actually produced in a given time, that alone meets the demands. Nothing will take the place of *the churn test* for fixing the real merits of butter cows.

It has long been our custom at Houghton Farm to make frequent churn tests of the milk of every cow in the herd, as well as of the mixed milk of the dairy. We had one cow of special excellence, called "Clover," good for 16 or 17 pounds of butter a week when at her best, and usually fresh in the spring. I had several of her May and June tests of over 2 pounds of butter per day. Two years ago she failed to calve in the spring and became fresh on dry feed. Testing her at the usual time after calving, when she gave as

much milk as formerly when fresh, I was surprised to get only 12 ounces of butter, when I expected 30 or more. We at once examined her milk and found it to be as rich in butter fats as ever. So I tried again, got 12½ ounces of butter from first churning of 37 pounds of milk, and then churned the same milk (buttermilk, now, you may call it) and got 12 ounces more of butter. A third churning of the same milk gave 5½ ounces, and a fourth, 1¼ ounces—a total of 31¼ ounces of butter from 37 pounds of milk. Churned a fifth time, the milk failed to yield any butter. This incident put us on the line of thought and action, which results in what I offer you here to-day.

Great care has to be taken to avoid error in all experimental work. In making a cow test, the nature of the food consumed prior to the period of observation is of importance, for the effects of a change of food upon the product of a cow are *not* immediate and *are* prolonged.

Twenty-six careful observations made at Houghton Farm at different times, show that changes in either kind or quantity of food effect the milk product for several days, varying from one to five with different animals, and averaging three and one-half days. It is therefore necessary to wait a few days after a change of food before its effects can be noted with any certainty and also to allow some time to elapse after stopping a certain food, before any conclusion can be reached as to its results.

Abundant evidence exists, not only that the quantity and quality of the food exerts its influence upon the butter product, but that the power of the churn to convert the fats of the milk into butter, largely depends upon the character of the food. In this connection your attention is asked to the valuable dairy experiments conducted at the New York Agricultural Experiment Station during January and February, 1883. [See Dr. Sturtevant's published bulletins Nos. 33 to 37.] *These indicate the importance of a careful study of the effect of food upon the churning quality of milk; they show a greater variation between the actual fat in the milk and the butter obtained, as the result of difference in food, than has been heretofore recognized.

At Houghton Farm, the records of feeding experiments contain the following results bearing on this point. Without repeating the details (published in the annual report of the New York State Dairymen's Association for 1882, but with some figures erroneously transcribed) the comparison between the actual butter fat contained and the butter obtained from the same by the churn, being the average products of the same lot of cows, fed differently in different months, is given in this table:

FOUND IN 100 LBS. OF MILK.	DRY FED,—HAY AND GRAIN IN APRIL.	FED CORN ENSILAGE AND GRAIN IN MARCH.	ON GOOD PASTURAGE ALONE IN MAY.
Actual fat.....	5.12 pounds.	4.37 pounds.	4.13 pounds.
Butter obtained....	4.95 "	4.36 "	4.21 "

*How far west these bulletins of the New York Station are pulished, I do not know; but no newspaper with a rural constituency in the Empire State now regards its issue as complete without the weekly bulletin from Geneva. They are copied in agricultural journals in other eastern states, and the example might profitably be followed over a wider territory.

A similar trial with a single cow, selected for the apparent uniformity of her product, and of her health, appetite and general condition, month after month, gave these results:

100 LBS. MILK FOUND TO CONTAIN	FED HAY AND GRAIN IN MARCH.	FED CORN ENSILAGE & GRAIN IN MARCH.	FED CORN ENSILAGE ALONE IN APRIL.	ON GRASS PASTURAGE IN MAY.
Actual fat.....	4.76 pounds.	4.42 pounds.	3.93 pounds.	4.64 pounds.
Butter obtained	4.23 "	4.39 "	3.95 "	4.75 "

The fat determinations are not the result of full chemical analysis, but are obtained by the Marchand Lacto-butyrometer, introduced by Prof. Caldwell. In connection with these figures it may be remarked that as no method of perfect churning is known, a considerable percentage of butter fat being always found in the skim milk and butter milk, yet the percentage of water in all good butter is so much larger, that no churning can be regarded as satisfactory that does not produce a greater weight of well-made, unsalted butter, to a given quantity of milk, than the chemist can obtain of pure butter fats.

The above results, although they should be considered as merely preliminary to necessary further investigation, appear to establish the variable effect of different food upon the *churning quality* of the milk product, and the Houghton Farm experiments, partially supported by those of Geneva, indicate that the greater the proportion of succulent food, the more completely the churn will do its work.

It will be at once noticed that the practical application of this matter, so far as it proves true, most concerns those who follow winter dairying. The indication is that there is a pretty heavy loss of butter in any herd kept in winter quarters entirely on dry feed. Should future investigation verify the facts now presented, a supply of succulent food for winter use will become a necessity to economic dairying. This food, in our northern states, must be either in the form of roots or ensilage. There are some localities where large crops of roots can be easily and profitably grown. In such cases, I am not prepared to argue that any form of ensilage is either better or cheaper. But it is certainly true that, as a general rule, ensilage is the better way for the dairy farmer to provide his cows with a green bite in winter. This is as far as we have got with ensilage at Houghton Farm. We substitute it profitably and with very satisfactory results for all kinds of roots and for all stock to which roots are fed; and in quantity we only feed it as we would roots. But this ensilage subject is too big to be introduced here, and there is abundant information upon it in print, accessible to all.

Our first point is, therefore, that in testing any cow or any lot of mixed milk, the character of the food given to the cow or cows involved, needs to be carefully considered.

The next question is, how should milk in quantity, or by sample, be handled, in order to accurately test it?

A series of experiments made at Houghton Farm has led to the conclusion that in churning the whole milk there is no certainty of getting all the obtainable butter at the first churning or even at a second churning. It has been a custom at this farm to treat the milk of every cow separately, getting

the ratio of her milk and butter products in one day, several times in one year, keeping a daily record of her milk product. For this purpose, it was usual to churn the whole milk, but sometimes only the cream. First, it was noticed that the results were better when the cream was separated and churned. Next, it was found that the aggregate butter product from churning the milk of one day from twenty cows, being twenty separate churnings within ten or twelve days, was not so great as when the milk of twenty for one day, was mixed and its cream churned. With the extra care, and the well sustained theories of gain by handling every cow's product by itself, it was thought that the result should be just the reverse. Then, the butter produced by certain cows, in a single day, the whole milk being churned, separately, for every cow, was found to be below the known butter capacity of these animals, severally. These observations led to the examination of the butter-milk, both with microscope and by repeated churning, and it was found that, generally, good butter could be obtained by second and third churnings of the same milk. Among twenty cows thus tested during the winter months, the animals only receiving dry forage, it was found that to get all the butter possible with the churn, when using the whole milk, the latter had to be churned once for three cows, twice for twelve cows, three times for four cows, and four times for one cow. At another period, when, although still in the stables, these cows had a good ration of succulent food, roots, or ensilage, the fourth churning secured no butter in any case, the third churning in only two cases, and the second churning in but eleven. Again, when the cattle were at pasture, all the butter obtained by the churn from the milk of one day from the same cows, separately handled, was got at the first churning from 15 cows, and at the second churning from four cows and at the third churning from one cow. The three periods being well separated individual cows varied as to their time from calving, but the average milking period of the whole number was substantially the same. This was regarded as merely a preliminary investigation, and so incomplete in points of detail (chemical tests of actual fat in the milk of several churnings, &c.,) that these general statements seem safer to cite, than the entire record.

As illustrating the point under consideration, two examples here follow in the table "M."

Treatment and Churning.	The Cow "Clover" Calved Dec. 18th. Weight of One Day's Product.			The Cow "Daisy" Calved Jan. 1st. Weight of One Day's Product.		
	Jan.	March.	May.	Jan.	March.	May.
Whole milk churned in lbs and oz....	37.07	33.13	34.00	28.01	25.02	22.09
Butter obtained in oz:						
1st churning, temperature 74 deg..	12½	15⅝	18½	21	18¾	19¾
2nd churning, temperature 70 deg..	12	9⅜	8	3	1½	.....
3rd churning, temperature 66 deg..	5½	3⅝	2	.....	.....	.....
4th churning, temperature 62 deg..	1¼	.....	.....	.....	.....	.....
5th churning, temperature 62 deg..	0	.....	.....	.....	.....	.....
Total butter obtained, oz.....	31¼	28¾	28½	24	20¼	19¾
Butter percentage of whole milk.....	5.21	5.32	5.24	5.35	5.03	5.41
Whole milk churned, lbs and oz.....	39.01	35.04	34.04	30.04	26.00	23.00
Butter obtained in oz:						
1st churning, temperature 70 deg..	14¾	17⅛	19¾	19	18⅞	19⅝
2nd churning, temperature 70 deg..	16½	12¼	9½	5⅝	2	.....
3rd churning, temperature 70 deg..	2¾	1⅛	.....	.....	.....	.....
4th churning, temperature 70 deg..	.....	.....	.....	.....	.....	.....
Total butter obtained, oz.....	.34	.30½	.29¼	24⅜	20⅞	19⅝
Butter percentage of whole milk.....	5 45	5 40	5.34	5.03	5.05	5.33
Whole milk of one day, lbs and oz....	40.04	36 00	33.07	29.12	26.06	22.11
Its cream churned lbs and oz.....	12.03	11.04	9.12	8.08	8.00	6.14
Butter obtained in oz:						
1st churning.....	32½	29⅝	27½	25¾	23¼	20
2nd churning.....	2¼	1⅜	1½	.....	.....	.....
3rd churning.....	.....	.....	.....	.....	.....	.....
Total butter obtained in oz.....	34¾	31	28¾	25¾	23¼	20
Butter per cent. of whole milk.....	5.40	5.31	5.29	5 41	5.54	5.49

The milk was taken for test on three consecutive days, in the three different months. Twenty-four hours was allowed to elapse between the consecutive churnings. In almost every case, the churning subsequent to the last when butter is recorded as obtained, developed butter pellets of mustard seed size but not in sufficient quantity to gather and weigh.

The main notes upon table "M" and other similar records, are as follows:

A. The milk of one cow, dry fed, had to be churned four times to get all available butter, while that of another cow needed but two churnings, the same day—cows of like age, breeding and condition and feed the same.

B. The results were better when churning day after day at the same temperature, and quite high, than when the temperature of the buttermilk was lowered on consecutive churnings.

C. More butter was obtained, with less labor, where the cream only was churned. It should be noted that the skim-milk examined in these cases showed no unusual percentage of butter fat not separated.

D. The more succulent food consumed by the cows the quicker and more completely the churn did its work.

E. The quality of butter obtained at first churning was in nearly every case perceptibly better than in subsequent churnings.

F. A noteworthy case is that of "Clover," whose milk in January gave more butter at the second churning than at the first. Microscopic examinations of her milk shows unusual variation in size of butter globules, and comparative examinations indicate that the butter of the first churning was from the largest set of fat globules, and that of the second day's churning from the globules of a size smaller, and more numerous. But it is difficult to accurately compare the physical character of milk before and after churning, *i. e.*, new milk and butter-milk.

In the instances of repeated churnings there was no marked difference in the time required for getting the butter. The longer churnings were sometimes the first and sometimes the last, so the record is devoid of interest. The average time for fine butter pellets to show was twelve minutes, and for whole churning twenty-seven minutes. A swinging churn was used, no dashers—agitation without beating. The churning was stopped while the butter was in grains, these were hardened with cold brine, then thoroughly washed and dried and weighed in the granular form.

The conclusion reached (subject to verification by further tests of like character with the same cows) is that churning the whole milk product of a day or more is a very uncertain means of determining the butter quality of the milk,—certainly so unless repeatedly churned, involving much labor.

Not only in the cases of the two cows, as shown in table "M," but the examinations throughout the herd at Houghton farm, gave far better results when the cream was well separated and churned by itself. In these tests the "deep setting" system of separation, or "creaming," was used—open pails in an open spring pool, and hence the cream was bulky. A few trials with shallow pans gave still better results. In no other way was so large a percentage of butter obtained from a given quantity of milk at the first churning, as where the milk was creamed in shallow vessels and the thick cream churned. In tests of the mixed milk of the whole herd the following results were obtained from 100 pounds of milk:

Butter Product from 100 lbs. Milk.	In January Churned.						In May Churned.					
	Whole Milk.		Thin Cream.		Thick Cream.		Whole Milk.		Thin Cream.		Thick Cream.	
	Lbs.	Oz.	Lbs.	Oz.	Lbs.	Oz.	Lbs.	Oz.	Lbs.	Oz.	Lbs.	Oz.
First churning	2	15	3	14	4	9	3	12½	4	8	4	9
Second churning	1	5	1	4¼	0	11	0	8	0	0	0	0
Third churning	0	9	0	0	0	00	0	0	0	0	0	0
Fourth churning	0	0	0	0	0	00	0	0	0	0	0	0
Total butter	4	13	5	2¼	5	4	4	4½	4	8	4	9

Difficulty is experienced in thoroughly creaming or separating the butter fats (cream) from milk in any of the usual methods. A portion of the fat globules remain in the creamed (skimmed) milk, varying with the same cow under different conditions and with different cows under like conditions,

from .25 to 1.2 per cent. of weight of the whole milk, and averaging .6 per cent., or about 9 ounces of fat to 100 pounds of milk. This leaves too great an opportunity for loss. It is true this common loss is in the form of the smallest fat globules of poorest butter quality, yet as they are capable, when secured, of conversion into butter, they should not be ignored.

The centrifugal separator, or dairy centrifuge, is the appliance which more completely separates the fats from milk than any other yet devised, leaving an average of only .29 per cent. fat (of the weight of the whole milk) in the creamed milk. "Skim milk" from a centrifuge has been analyzed which contained but .05 per cent. of fat; in other cases .07 and .1 per cent.

It would appear, therefore, that the ideal method for cow tests, is to first cream the milk by centrifugal force and then churn the cream. For this purpose a dairy centrifuge is needed which will handle a single milking, or one day's product from a cow—say 20 to 80 pounds of milk, and operated by hand, foot or some light power.

Allow me in conclusion to repeat that these two points in the details of butter dairying, the uncertainty of churning whole milk, and the effect of the kind of food a cow consumes, upon the churning quality of her milk and cream, seem to justify further investigation. The experiences of Dr. Sturtevant at Geneva, and my own at Houghton Farm, at least warrant the suggestion that a new, interesting and important field has been opened for dairy experiments. You will doubtless agree with me that such dairy studies cannot well be conducted by private parties with ordinary farm accommodations. We have here, therefore, another good reason for urging the establishment of an experiment station for the benefit of farming—certainly including dairy farming—in every state.

I shall be pleased to answer any questions that may be asked, so far as I can.

MR. BROOMELL: It is a known fact among our gathered cream men, or men running the gathered cream system, that, while with the standard measure they have no great difficulty in having their cream "hold out," as they term it, during the summer, or in other words, that a certain number of inches of cream on the average through the summer will produce a corresponding number of pounds of butter, and there is likely to be a surplusage, yet, as a whole, the reverse of this is true in winter. And I would like to ask the gentleman this question, whether the facts that he has presented this evening in regard to the value of succulent feed on the churning quality of the cream does not in a measure explain that difficulty?

MAJOR ALVORD: I should think it might help, but rather than accept it as the explanation, I would make this suggestion: My belief is, from my own experiments, that the butter is there in the winter time as much as in the summer; that it is simply a failure in the handling of the cream to obtain all the butter. Of course this depends in a great measure upon the handling of the stock, but taking for granted the fact that the cattle are reasonably well cared for in the winter time, I have always found that at that season the milk of cows of an average herd at all stages from calving down has a greater percentage of fat in cold weather than in summer. This I have ascertained to such a certainty that in our own herds we do not want to make milk in the months of July and August, or at least from the 10th of

July till about the 10th of September, because at that time the milk is the poorest of any time of the year, containing the least percentage of butter fat with even the best butter cows. I would suggest, that to test this very point which has been raised, and which certainly is an important one, that the chemists of your state colleges and directors of your state experimental stations, where you are so fortunate as to have them, be sent samples of your winter cream and of the buttermilk which remains after churning your winter cream, to ascertain whether, as a matter of fact, there is not a large loss of butter in the winter, through its remaining in the buttermilk. That being the case, then try the effect for a few weeks with a few cows of some succulent food and see what the result may be—turnips, cabbages, any succulent food. Not that you will get very nice butter, but it will perhaps lead you in the right direction again towards quantity, even at the expense of quality.

Singing, "America," J. G. Lumbard and chorus.

Convention adjourned to meet at 9 the next morning.

Convention met pursuant to adjournment at 9 o'clock A. M., December 13th.

The following telegrams were received and read by the Secretary:

AUSTIN, Minn., Dec. 12, 1883.

R. P. McGlincy:—The Minnesota Butter and Cheese Association sends greeting to the Illinois Dairymen's Association. The youngest of the dairy sisterhood, though yet an infant, is two hundred members strong and still growing. Banquet Thursday night; we will drink prosperity to all dairymen in a bumper of fresh milk.

W. C. RICE, Secretary.

AUSTIN, Minn., Dec. 12, 1883.

R. P. McGlincy:—Minnesota Dairy Meeting; immense crowded houses; Minnesota greets Illinois; success to the cow party.

LITTLER.

It is moved and seconded that the Secretary be instructed to answer the telegrams.

The following telegram was sent by the Secretary:

DEKALB, Ill., Dec. 13, 1883.

W. C. Rice, Secretary, Austin, Minn.:—Illinois accepts Minnesota's greeting. The mother of western dairy states is proud of so favorable a report from her youngest child. Drink hearty.

R. P. MCGLINCY, Secretary.

Committee appointed by the President, consisting of Mayor Brown, of DeKalb, Mayor Barclay, of Elgin, and W. D. Hoard, of Wisconsin, to receive the Governor.

Committee on Dairy Implements.—Lovejoy Johnson, M. W. Colton and T. H. Baker.

Committee on Resolutions.—C. F. Dexter, O. S. Cohoon and J. A. Ryan.

"SHOULD THE ELEMENTS OF AGRICULTURAL SCIENCE BE TAUGHT IN THE PUBLIC SCHOOLS?"

BY PROF. FRANK H. HALL, OF SUGAR GROVE.

Permit me to thank the principal of the public schools of this city, who has done me the honor to dismiss one of the rooms of his school, to listen to my paper. While the paper has not been prepared for young people, it makes me feel quite at home to see the faces of so many young ladies and gentlemen in the audience.

We are proud of our public schools. We are proud of the buildings that have been erected by liberal hands in which to educate the youth of our land. We are proud of the salaries that are paid to our teachers—salaries that ought to and do command the services of skillful educators. We are proud of the fact that our schools are free; that all the youth, rich and poor, black and white, high and low, may meet on a common level and receive the training that shall prepare them to perform life's duties. Palsied be the hand that shall be lifted to render less efficient our public school system. Palsied be the tongue that shall encourage unwise parsimony in the disbursement of school funds. He merits severe censure who unjustly criticizes so earnest and faithful a band of workers as are the army of men and women who are engaged in the work of instruction.

There is, however, one accusation that, of late, is often laid at the door of our public schools. It is a serious charge. It is made by business men; by intelligent farmers and mechanics; and teachers who have abandoned their profession and are attempting to gain a livelihood in some other manner are quite certain to echo it.

The imputation is this: That the tendency of the public school work, and more especially the work of the public high schools, is to lead the pupils away from the farms and the workshops, and toward the professions; that public money is expended to induce young men who would otherwise become artisans, to become lawyers and doctors.

Is the charge true? Is it a just criticism? Are the schools in any way responsible for the rush toward those avenues through which men may gain a livelihood and still have white hands?

That too large a number of our young men are in the professions, or on the road thereto, is quite certain.

In 1870 we had one clergyman for every 878 persons; in 1880, one for every 775 persons. In 1870 we had one physician for every 618 persons; in 1880, one for every 558. In 1870 we had one lawyer for every 231 males above 21 years of age; in 1880, one for every 200. During the decade referred to the population was increased a little over 30 per cent. The number engaged in agriculture increased less than 30 per cent., while the number of doctors, lawyers, ministers, and editors, combined, increased nearly 50 per cent. Our larger towns and cities are full of educated place-hunters. It is not that they have seenin th emselves a personal fitness for professional life; it is not that they have had a call from high heaven to go into that field and work for God and humanity. They don't want to sweat. It is the common testimony of business men that they are overrun by young men applying for positions in

which brain work alone is required. Comparatively few young men are learning trades, and scarcely any are making the effort to fit themselves for intelligent agriculturists—and all this in a country in which half the people are tillers of the soil, and skillful mechanics command most tempting remuneration.

But are the schools responsible for this state of affairs? Certainly not wholly—perhaps not in the main. But may they not, at least, be *one* of the important factors that produce this unfortunate result?

The good book tells us that we may judge a tree by its fruits, and I know not what may more properly be considered the ripened fruit of the public school system than the graduates of the public high schools. Where are they? I answer, in the professions. Nearly eighty-five per cent of the male graduates of any high school, with whose history I am familiar, are either attempting to gain a livelihood by professional labor, or, having attempted it, have failed.

This fact alone, which can easily be verified, would seem to prove conclusively that the tendency of the public school system is towards professional life. In the primary school the pupil is prepared for the grammar school; in the grammar school, for the high school; in the high school, for the professional schools. He who stops short of the high school, and becomes a farmer or a mechanic, is simply an abortive specimen, and should not be taken in evidence of the tendency of the schools. Indeed, I can call to mind a score of young men who, years ago, entered high schools with the avowed intention of preparing themselves for mechanical or agricultural pursuits. But while in the school their ambition was changed. They have either completed the course and become lawyers or doctors, or they have abandoned it and become farmers and mechanics. Those who have completed a high school course and become handicraftsmen are marked exceptions to a general and almost universal rule.

But let us inquire why this is true of the schools. What is there in the course of study or in the surroundings of the pupils that diverts them from an original purpose of becoming intelligent farmers, and awakens within them a desire to earn their bread by the wielding of tongue or pen?

First: The teachers themselves, for the most part, have this desire. Were it otherwise, they would not be in the school-room. Here, then, is a difficulty in the very nature of the case itself. At the head of our theological schools are men who have succeeded in an eminent degree as preachers. Their pupils imitate them and become preachers. At the head of our medical schools are men eminently successful as physicians and surgeons. Their pupils imitate them and become physicians and surgeons. At the head of our public schools are teachers. Their pupils imitate them and become teachers, and use their profession as a stepping-stone to medicine, law, or theology, as their teachers, earlier in life, perhaps, desired and intended to do. It is only by the most strenuous, constant, and watchful effort that the teacher, whose life is spent in the school-room and among books, can so far come out of himself, as it were, as to enter into a warm and helpful sympathy with the boy who is to become a farmer. Without this effort he will, unconsciously, perhaps, lead his pupil to strive to occupy a higher plane, not as a farmer, but by abandoning the farm.

Secondly: The pupil who wishes to become a lawyer or a preacher is easily conviced that all his school work will be of value to him in his professional work. Not so with the future farmer. He sees comparatively few points of contact between the labor in the school-room and the labor on the farm. Unless special and well directed effort is made by the teacher, the pupils will entertain the idea that the higher branches in the school course are not for those who wish to become farmers. It may be true that all the studies of the course would benefit the future farmer; but so long as he remains unconvinced of this, so long will he fail to do vigorous and hearty work in the school-room. It requires the skill of one who knows something of the science and art of agriculture to lead the farmer pupil to a proper appreciation of the value of a course of study. Even while I was writing this page a wealthy farmer from the town of Blackberry came to my room, and said substantially as follows: "I have a son sixteen years of age. He is somewhat backward, but says he does not wish to go to school any more. I would be very glad to send him to school and pay the bills if he would go."

"What are the objections," I asked, "to his attending school?"

The reply was, "He says he's going to be a farmer, and won't need any more education."

It is not enough that an abundance of plain intellectual food be provided. It must be seasoned with such condiments as will make it relish—as will whet the appetite. The public schools provide these condiments for the future lawyers and preachers. There are declamations, debates, little essays on great questions, the study of biography, especially the biography of those men who have excelled as poets, historians, statesmen, theologians and politicians. But such condiments as these are often nauseating to future farmers. Says the young man who expects to gain his livelihood by tilling the soil: "What care I to learn to declaim and to make gestures? I shall be a farmer. I expect to pitch hay and husk corn. Practicing gesticulation before a looking-glass will not give me muscle for this nor skill for that. What care I to understand the various steps by which men have become great poets and statesmen? There is no poetry in hog-raising, and it takes patience, not statesmanship, to break a colt or milk a cow in fly time."

But the young man in whom there is an ambition to stand in the pulpit, on the rostrum, or in the senate, takes great delight in these studies. He prepares his declamations and his essays with great care, for which he receives commendation from his teacher and applause from his schoolmates. This to him is but a foretaste of the honor that he expects to receive from the outside world in after life. He enjoys his school work and he'll "finish the course."

But what shall we do, what *can* we do to hold in the schools the future farmers? I answer, introduce so much of agricultural science into our courses of study as shall be necessary to make them realize that the school course is for them; that it shall enable them to perceive more points of contact between their school life and their farm life.

No sooner do I make such a statement as this before a body of teachers in this state than some teacher rises and affirms with vigorous and appropriate gesture that "the public schools are not designed to make farmers but men;" and within a month he will resume his work of making lawyers. I quite

agree that the legitimate work of the public schools is to make men—but let's make a goodly portion of them men who can earn their own living!

I wonder if the teachers in this great state keep in mind the fact that for every thousand boys that are, or ought to be, in the public schools, there are to be but four lawyers, four clergymen, five physicians, five teachers, one dentist, and one journalist; and that there are to be five hundred agriculturists, two hundred and twenty mechanics and miners, and one hundred and twenty that will be engaged in the various departments of trade and transportation. Half the boys to be farmers and the elements of agricultural science omitted, or at most not made prominent in the school course! If chemistry is taught it is that part of the science that is of especial importance to the scientist, or necessary for the druggist and physician, that receive the chief attention. Few pupils in our public schools are aware that there is anything of practical value to the farmer in the science of chemistry. Botany is treated in a similar manner. The farm side of the study is omitted. Pupils learn the scientific names of a few pretty wild flowers, but they cannot call by their names the weeds in the corn fields or the grasses in the meadow. The boys who are to cultivate plants, leave school without knowing how plants are fertilized or varieties produced. They are unable to describe the new weed appearing on the farm, so that the editor of the agricultural paper can recognize it from the description. The boys have learned square root and cube root and are studying algebra, but they cannot measure a corn crib correctly, or estimate the lumber for a hog-house.

Since half the boys are to be farmers, it is quite proper that farm science should occupy a prominent place in the school course. Wherever a study touches farm life this should be made apparent to the pupil. Arithmetic, chemistry, philosophy, botany, zoology, and even spelling and reading should be made to lean more towards the farm. Pupils should be taught the chemistry of milk, of butter, of cheese, of food, of plants, and of soils. They should learn the anatomy, physiology and hygiene of our domestic animals, and something of the history and characteristics of the different breeds. In nearly all our agricultural papers may be found valuable articles upon the science of agriculture. But the farmers do not read them. The few may do so. The majority read until confronted by such words as "non-nitrogenous," "carbo-hydrates," "anchylosis," or "exostosis," when they quietly fold the paper and put it away or seek some part of it written by a man whose vocabulary is no larger than their own. (Pardon me, my friends, I do not mean you, I was speaking of the farmers who never attend conventions; who churn without using a thermometer, and work their butter in a bowl, and their name is legion) The next generation will be but little better prepared to avail themselves of the experience of others as found recorded on printed pages, unless something is done to retain longer in school the future farmers.

Mr. Dexter is soon to address you upon the "Educational Power of Conventions." The theme is an important one. The value as an educational force of the meetings of the Illinois State Dairymen's Association can scarcely be overestimated. Thousands of farmers who have never attended one of our meetings have felt their influence. A large part, indeed, of the work of the Association is in a sense direct. The few who do attend accu-

mulate a stock of information and enthusiasm which they sow broadcast. Some teach by precept, some by example; some by spoken words, others through the printed pages; but all these influences primarily affect *the men and the women.* Through the public schools the boys and the girls may be reached. These may and should be provided with a vocabulary that will give them far greater facility in acquiring knowledge than that possessed by their fathers and mothers. To do this, they must be retained longer in the schools. The course of study must be so modified that the number of farmers among the graduates will at least be equal to the number of lawyers and physicians.

In conclusion: I have no harsh criticism for that young man whose ambition leads him to leave the plow or the workshop, and to seek the labor and emoluments of professional life. My criticism is for that teacher who, perhaps unconsciously, is taking material that would make first-class farmers and mechanics, and making it up into third-rate doctors and lawyers. My criticism is for a system of public schools, in an agricultural state in the very garden of the world, more than 85 per cent. of whose male graduates become professional or commercial men. My criticism is for such an expenditure of public money as will induce young men, who otherwise would have remained in the ranks of the industrial classes, to join the ranks of the professional classes, while the future tillers of the soil are in a degree neglected.

The exigencies of the times do not demand that the state should expend a portion of its ample resources in coaxing young men to study law, or medicine, or theology. The exigencies of the times do demand that the toiling masses should be better educated. This will be accomplished when they are made to feel that the schools—higher departments as well as lower—are for them.

Let the members of this convention on all suitable occasions earnestly request of teachers and school officers that a few of the more simple and practical facts in agricultural science be taught in the school room; let our agricultural press urge this, and the day is not far distant when the schools of this agricultural state will proudly number many intelligent farmers among their graduates. One year at least would be added to the school life of the next generation of farmers. Then would farmers' conventions be more frequently held, agricultural books and papers more generally read, farms would be better tilled, the stock better bred and better cared for, and thousands of dollars added to the material wealth of the state.

MAJ. ALVORD: Permit me, sir, to congratulate this Association upon securing this paper, and this convention upon their fortune in being present to hear an essay so interesting, instructive, and, I think, so important. I cannot conceive, sir, of any subject coming before this convention so fraught with importance to the future wellfare of this and all our other states as the one which has just been so ably presented. I do not believe that any one can carry home from this convention so much good as they can by laying every line and precept of this excellent paper to heart, and by resolving to back it up by all their influence when they get home. I believe that the appropriation made by the state of Illinois for this convention will be amply justified by the single fact of having this paper printed in the report of this convention. And I believe the Superintendent of Public Instruction could not do a better or a wiser thing with part of the money at his command than to put

a copy of this essay, in pamphlet form, into the hands of every public school teacher in this state. It has been my fortune, sir, to be a teacher in an institution of learning in the east, between the high schools and the higher scientific schools and colleges, and connected with an institution that had a large fund of endowment for helping poor boys to get an education. Our experience was, that out of every four boys that came there without a cent, wishing to get a good education, three of them would want to study Latin and Greek, and not much of anything else. The fourth, perhaps, would be willing to take up some of the practical and scientific studies. We have dozens and dozens of young men coming to our house, who, in spite of all our influence, insisted upon taking themselves right away from everything they were fit for just about far enough to spoil themselves for good farmers and good mechanics, having neither means nor brains to go further. On the contrary, those young men who came to us with a broader view of life, and who took the scientific side, almost invariably found themselves on their feet. I think I am safe in saying that out of five men who graduated from the scientific course, four would find themselves well placed in life, earning their living, before one out of five taking the classical side would be getting anywhere near a decent living. I am at present in a position where almost every month of the year I have applications made to me for young men to assist large farmers and owners of large farms, in managing their business, either to take entire supervision, brain and muscle combined, having been trained with a combination of practice and science, to take charge of large estates, or to assist the owners in their work. I am not able to find one young man for ten applications. There is an opening for well educated young farmers. I don't know of any occupation, unless it is the highest skilled mechanics, that to-day promises so well to young men to fit themselves, even at expense, even if they have to borrow money to do it, as in the progressive agriculture of the United States.

The gentleman has alluded to declamation and gestures in connection with a farmer's life. My humble opinion is, that if the rising generation of farmers will learn and exercise the powers of declamation and put a good deal of emphatic gesture into their speech and their work, then the farming interests of this country will receive better recognition at the hands of the powers that be than they will otherwise. It is time to have declamation.

MR REED: I wish to make a criticism on Mr. Hall's paper and have two corrections made before it gets into the record. He alludes to the higher plane in education of the classics and higher professions. I claim that agriculture is just as high as any other. And another one: He said a poor doctor made a good farmer. It takes the best man to make the farmer.

THE EDUCATIONAL POWER OF CONVENTIONS.

BY C. F. DEXTER, OF CHICAGO.

The primitive man lived in caves and holes in the ground, and fought for the poor privilege of existence with wild beasts and his fellow men, his sole weapon of defense and attack, a club.

The Darwinian theory of the survival of the fittest must have meant in that age the survival of the toughest—the supremacy of muscle. But even

then there were signs of the coming day, when mind should assert its supremacy over the physical and brute forces, when the pen, the emblem of the one, should be mightier than the sword, the symbol of the other. Between the club of the savage, and the printing press and telephone of the civilized man, history shows an unceasing struggle with natural forces; a restless sea of conflict with advancing and receding waves of victory and defeat. And all along the perilous shore lie the graves of the martyr spirits who have carried the world's progress in their brains as incorruptible trustees of the eternal purpose: Socrates, condemned to death for knowing more than his fellows, who died, leaving as a legacy, which the world seems slow to claim, his conviction that nothing can harm a really good man either before or after death; Galileo, imprisoned by men who fought against the harmony of the universe; and a thousand others, less known and sooner forgotten, who could not be false to their inspirations.

Imperfect as it is, the record of man's struggle toward a higher plane of existence shows the operation of the law, that only through the reflex action of varying mental powers can moral or material progress be secured. The common weal and individual welfare are promoted in direct proportion to the free interchange of the results of thought, research and achievement, among nations, communities and individuals of different powers, or working under different conditions. This interchange is really the basis of all the activities which we call civilization, and any means by which such interchange can be promoted have a valid claim for support.

If there ever was a time when the association of men for the furtherance of a legitimate common interest needed a defense, that time has long since passed. Occasionally a man, who by years of constant work and costly experience has reached an advanced position in the pursuit of a difficult branch of industry, is heard to say, that his knowledge is a part of his property, his experience his working capital, and he cannot afford to give it to the public and thereby facilitate and increase competition to the injury of his material interests.

If he is a well-informed man, as he is likely to be, he may add that he regards the request, which sometimes assumes the form of a demand, that he give of his hardly-acquired knowledge—as not far removed in principle from the communistic demands for a division of the property of the able, industrious and self-denying class, among the incapable, shiftless and improvident. He may say that the government protects by its patent laws the interests of inventors; that improved processes of great value, unpatentable in their nature, are kept secret by manufacturers to further their interests, and in equity, the individual worker in any field is not less entitled to the exclusive benefit of his own researches so far as prudential reserve can secure it, although the results of his experimental work may not assume a patentable form.

This is perhaps a somewhat strong statement of the only argument ever offered against the principle underlying organization and association, and a refutation may seem like an attack upon a man of straw; but the argument is probably oftener urged than the members of this Association would readily admit.

The advocate of such an argument may well consider how small a part of

his entire outfit, mental capacity, knowledge, and facilities for accomplishing his purpose, is the result of his own unaided efforts, and how largely he is indebted, as the heir of preceding generations, to the freely given labors of others.

Subtract from the world's knowledge the result of the labors and research which men have given from a desire to leave the world better than they found it, better prepared for the irrepressible conflict between man and the forces of nature, and you place the race far back in the dark night of barbarism.

No man liveth unto himself without dwarfing himself mentally and morally, while by a free intercourse and interchange, he gives of the product of his own field and partakes of the harvest from a thousand. and an apparent sacrifice of purely material interests is repaid a thousand fold in better coin than the pieces of yellow metal which we call money.

Who, among the active members of this and similar organizations has not felt an expansion of the generous, unselfish elements of his nature, and a high order of enjoyment, while standing on the platform and giving of his abundance to those in sore need? Who has not felt an increasing respect for the man, however humble his work, who stands in the presence of his fellows and tells of that which he doth surely know to all who may desire to hear? Therefore, freely as ye have received, from all the centuries of human effort and triumph, freely give. It is the giving which doth not impoverish, blessing alike giver and receiver.

At the Exposition of Railway Appliances in Chicago last spring, the typical American inventor appeared in force. There were more than a hundred patented car-coupling devices, each of them believed by the inventor to be superior to all the others, and a multitude of other appliances, exhibited by men who cherished the delusion, that, with no practical knowledge of the tasks which they tried to accomplish by some phenomenal brain power, or genius peculiar to themselves, they could solve the problem and remedy the defects which had baffled the efforts and defied the experience and ingenuity of practical men for fifty years. The experienced railroad operator could detect at a glance the fatal defects of the apparatus exhibited by the inventive enthusiast, who had entered on a line of action knowing little or nothing of previous successes and failures in the same field of labor, and profoundly ignorant of his own ignorance. That exhibition and convention was an educator, which opened the blind eyes of men who had worked alone, and taught them that self-reliance is not less effective when tempered by humility and a knowledge of the experience of others.

The isolated worker is always subject to his own limitations. He can measure himself only by himself, and learn only that he is equal to himself—a worthless axiom, which suggests no action, and solves no problems.

Close not your doors and windows, lest you lose a few rays from your own rush light. Shut not out the sunlight and try to live by the light of your own candle.

The full value of organized association must not be measured or estimated by its influence on material interests alone. Man is a dual being; his social and moral well-being, in fact his entire character, depends mainly on the extent, as well as on the kind, of his intercourse with his fellow men;

and for more and better reasons than the usually accepted one, it is not good for him to be alone. The hermit's cell and the monastery—the policy of seclusion—has been tried and found wanting, morally and otherwise. In exact proportion to their isolation from their fellow men, and from the current activities in the world about them, men become absorbed in their own personal interests, material or spiritual, to such extent, that the natural love of self exceeds its proper limits and becomes the ruling force of a life time. In a general sense, isolation and contraction, intercourse and expansion, are, respectively, related terms in a chain of causes and effects. Most men know of other men who have limited their own power for good and lessened their own rational enjoyment of life, by holding aloof from the current interests about them.

From moral as well as other considerations, the principles underlying association demand endorsement. In spite of all that has been or may be said on that old exploded absurdity, "total depravity," there is in human nature an innate, often latent, love of justice, truth, and the common equities arising from the relations between men. The individual, while standing by himself, and responsible to no visible power, frequently holds his moral consciousness in abeyance, and suffers his interests to warp his judgment and control his decisions. But an association of just such men will put themselves on record in favor of a high standard in the conduct of life, and agree to be governed by a written or unwritten law of justice and honor. Man's natural love of justice for himself, founded on selfishness, if you please, is the most powerful influence in inducing him to grant it to others. He cannot demean himself by refusing to others what he demands of them, for himself; and so, in accordance with a moral law, through the necessities of all, comes the higher standard of conduct for the individual. An organized association of men for any purpose is therefore the premoter of advanced moral standards. Its purely democratic structure is based upon and demands respect for the rights of others, which is of the very essence of morality, and teaches justice and equity as the foundation of a healthy order of society.

The association of men on terms of entire equality is the best possible educational institution from which to graduate good citizens of a modern republic, or a "government of the people, for the people, and by the people."

The standing reproach charged against the American people is the persistent pursuit of the almighty dollar and the omnipotent influence of money await the possessor of wealth. In society, as in finance, gold is the accepted in American society. Social distinction, and frequently political preferment, standard, and respectable poverty is only a subsidiary coin, or discredited dollar, which, by a despotic social decree is legal tender for but a small amount of consideration. In a country which recognizes no claims based on name or ancestry, in which intellectual endowment and wealth are the only avenues to distinction, the mass of men must remain unnoticed and unhonored, and wealth becomes the absorbing ambition as the only available means of personal enjoyment and social prominence. In such a state of society, whatever promotes a free intercourse of men on a basis of perfect equality, does something toward correcting false standards. This organization, like others of similar origin and objects, is a republic pure and simple,—a democracy in the primitive sense of that much abused term, in which there is no

distinction on account of race or previous condition of servitude to silver; and mind is the standard of the man, and character the measure of his appreciation. All such associations operate as a mental stimulant, bring men together on terms of equality and good fellowship, enlarge their sympathies and induce them to forget for a time that their neighbor is rich and they are not, or *vice versa*, neither of which is worth remembering as a dividing line.

In this, the youngest among the nations, born on a wild, unbroken continent, its character formed largely by the intensely practical problems accompanying its growth, it is to be expected that the value of everything will be estimated by its power to further or promote material interests. Hence, perhaps, come the oft-repeated inquiries, "What's the good of it?" "Will it help me in my business?" "Is there any money in it?"

But as the vital issues and intricate problems interwoven with its early life become settled, the young nation, with a big "N" may be expected to reach out after a greater maturity of thought, and to recognize more fully the value of the inner man, which lives not by bread alone. The fellowship and social influences, the enlargement of the scope of our sympathies, and in a broad sense the cultivation of the sentiment of unity and the spirit of brotherhood, arising from these conventions, must not be ignored, because these results cannot be weighed or measured by any utilitarian standard, nor by their influence on the balance of the bank account. It is probable that many men have decided that they could not attend these conventions without neglecting business interests; but it is reasonably certain that no one ever regretted that, after counting the cost, he shook off the harness of business which, if constantly worn, cramps the growth of the man, and indulged for a time the other half of his nature. He is more likely to rejoice in the gratification of his social instincts, which expand on being released from pressure, and while so doing becomes convinced that his internal gain more than balanced his external loss.

The securing of a competency is a laudable ambition; but success in that direction frequently costs more than it is worth. Nature exacts the full penalty for the infraction of her laws, and when her most perfect work, the complex being man, in gaining wealth, represses his social instincts, narrows his sympathies and lives only for money-producing enterprises, his success is a disaster. In connection with some reflection on the subordination of the nobler powers to ignoble ends, the frequent sacrifice of the higher aims to secure superficial success, a profound American thinker asks the following portentious question: "Must a man be a failure in order to be a success?"

This pithy paradox might well form the text of a practical sermon on the conduct of life. But it is submitted in this connection only as a suggestion that, in the absorbing pursuit of material interests, there is danger of a dwarfed development which places the man out of balance and makes success a failure. Many a man is a phenomenal success, as an acquisitive being, and a stupendous failure as a man. Any instrumentality, therefore, which brings men together in large or small bodies, for the protection or promotion of proper objects, takes them out of the little circles of selfish action, cultivates the spirit of brotherhood and enlarges the entire man. A quaint old writer, reviewing the lessons of his life, sums up his reflections on the line

of policy suggested above by saying: "What I kept, that I lost, what I gave away, that I have." All values come from use. Possession is only a preliminary incident. When the incidental possession becomes an end and not a means, keeping is losing. When use is tempered by wise discretion, and dictated by an appreciation of the value of the whole man, using is keeping.

Join the associations therefore, and come up to the conventions. If it sometimes seems to cost more than it comes to, remember that if you come with the fraternal spirit, it will come to more than it costs.

MISCELLANEOUS.

MAJ. ALVORD: Mr. President, believing in the educational uses of conventions, and desiring to contribute to that line, I brought with me, as a matter of interest and information, eight or ten varieties of fancy cheese, chiefly American imitations of foreign cheese. With one exception, these cheese are American made. The manufacture of these cheese was commenced in New York for the purpose of trying to find a market for our surplus milk, and the farmers who supplied the milk, have, during the past year, averaged $1.54 per hundred pounds for their milk. It is merely a new way of putting the milk on the market.

MR. BROOMELL: Mr. Chairman, while we are under the head of miscellaneous, I would like to make a brief statement for the benefit of the dairy interests of the northwest. Word has been industriously circulated, I am told, during this winter, by men who had some ulterior motive in view, to the effect that the butter known as Elgin creamery butter, was, to a greater or less extent, being adulterated with lard in the factory where it is manufactured. We have a reputation on Elgin creamery butter which we cannot afford to lose. It has taken years to build it up and it is world-wide; therefore, in order to prevent this effort going any farther, the Board of Trade at its last meeting took action in reference to the matter, which action was unanimous and emphatic, to the effect that the manufacturer, who is a member of the board, being found adulterating butter with lard, or any other foreign substance, would be subject to suspension of membership, and that the directors have power to appoint a committee of three inspectors, whose duties it should be to search for any evidences of adulteration, either in a factory or by the inspection of goods that had been manufactured, and that any party found guilty, or refusing to allow these inspectors access to the factory for such inspection, should be expelled from membership in the Board of Trade. This also, was made to apply to cheese. I make this statement in justice to the factorymen who stand by straight goods.

MR. RICE: I am the bearer of a message from a groceryman in Rochester, New York, who has bought a great deal of butter in Elgin. He says: "Tell them to make better butter than they have been making in the last few months."

MR. BROOMELL: I want to say that it is recognized that we are making poorer butter this last fall than ever, but it is all down in grade, and it is because the feed is poor. We cannot get the best grade of butter out of sour, soft corn.

MR. JOHNSON: Such articles as I found in a paper the other day encour-

age the belief that we are all using neutral oil in making butter. I want to enter my protest against the distribution of any such articles as this.

MR. HOARD: Do you believe yourself, that there is such a practice?

MR. JOHNSON: I don't know that it is practiced by any creamery tributary to Elgin, and I don't believe it; and should be willing to put up considerable to find it out.

MR. HOARD: I believe in having just as much faith in my fellow man as the circumstances will admit. I have known within three or four weeks of negotiations between a creamery man and a butterine man in Chicago, and the creamery man hearing the butterine man say that he could get more butter by two and a half pounds to every hundred pounds of buttermilk, that the neutral oil aided in precipitating the butter, said, "If they can do it, why can't I?" You know that man's cupidity sold the Lord Jesus Christ for thirty pieces of silver, and your immaculate purity in Elgin is in danger from just such cupidity. You have started on the right road; employed somebody to hunt out this crookedness. I do not believe myself that you will help the matter at all in crying it down. There are some people who are never satisfied to let well enough alone; they are constantly wanting to adulterate something. This is a wicked and adulterate generation, God knows.

SECRETARY MCGLINCY: While this discussion is one of interest to all who are engaged in the manufacture of butter, or at least to all who have a reputation to maintain, and every manufacturer ought to guard his reputation with the utmost possible care, yet I think the proper steps have already been taken by the Board of Trade. I cannot agree with some of these gentlemen, for it does not seem, while we are selling Elgin butter at from thirty eight to forty cents, as we have done within the last two or three weeks, it doesn't seem to me that it is adulterated very badly, for, if so, the experts have been unable to detect it. I wish, Mr. President, to make a suggestion to this association. In going around through the country for the last three years, I find that the dairy interest in Wisconsin, Iowa and Minnesota is protected by the State governments and by the agricultural boards of those States. I find that Minnesota, the youngest dairy state in the west, offers a larger amount in premiums at the State fair for butter and cheese than we do in Illinois, the banner dairy State of the northwest. Meeting Col. Mills a while ago, I told him I thought it would be good policy for the fat stock interest to unite with the dairy interest and hold a fair. He said, "Certainly it would; I am right with you in that movement." He said, "Suppose your convention in December sends a representative down to us in January, who will give us your ideas on how such a meeting should be conducted?" He told me he himself would spend as much time as necessary in interviewing merchants in Chicago, and other places in the State, for the purpose of raising $1,000 or $1,500, which should be offered as premiums for butter and cheese, in connection with the next fat stock show. I told him I had no doubt this convention would heartily join hands with him in placing the dairy farmers, in this State certainly, on an equal with the States of Wisconsin and Minnesota. I offer this suggestion. We would like to have this convention, if it entertain my views, designate a representative or two or more to attend the meeting of the State Board of Agriculture, in January,

and lay the matter before them, ascertain what they will do, and if it meets the views of all parties, that they may lay out the work for holding a fair, in connection with the fat stock show, where the butter and cheese of Illinois may be exhibited to all the visitors who come from all over the country to see that fat stock show. Members of the State Board of Agriculture are here, and we would like to hear from them as to how they look on this proposition.

E. E. CHESTER, OF THE STATE BOARD OF AGRICULTURE: *Mr. President, Ladies and Gentlemen*—I hardly need say a word, your Secretary has covered the whole ground so well. The members of the State Board, in their discussions, have, among other things, looked at the geography of the State. They have looked at the three belts of the State, and we, in our discussions and conversations have been asking ourselves if we had done our duty as representatives of the people in this State Board of Agriculture, towards each and all of these districts—the wheat, the corn, and the dairy districts? We think that for the central or corn growing part of the State, in the fat stock show, we have developed at least great things. We think that possibly we have not done our duty to this great interest—the dairy interest, and, while I am not authorized by the Board, officially, to say we are prepared to meet you, yet, from these conversations and discussions, as I have been asked to appear before you, I can just say this, and simply this, that I assure you that the State Board is ready to co-operate with this association in any interest that will further the interests of the State of Illinois. That we will not only look upon it as a privilege to confer with your delegates at our winter meeting in January, but we are also further willing, I assure you, to co-operate with you in an annual exhibition, either at our State fair or at the fat stock show. We are ready to co operate with you at one or both of these, our great exhibits of Illinois. At present, I believe I have nothing more to say, but to give you assurance that we are ready and willing to greet you and to co-operate with you, and will be glad to meet your delegates and confer with you here or at Springfield.

ACTION OF STATE BOARD OF AGRICULTURE.

Resolved, That space be granted the Illinois Dairymen's Association for an exhibition of dairy products in the exposition building during the continuance of the next fat stock show; *provided*, that no expense is incurred thereby to the Illinois State Board of Agriculture, and that the Illinois Dairymen's Association be requested to hold such exhibition.

Resolved, That a committee of three members of this Board be appointed to confer with the officers of the Illinois Dairymen's Association, in reference to this matter, and arranging the details.

The committee appointed to confer with your association in arranging details consists of Messrs. Griffith, David and Chester.

January 1st, 1884.

Committee on by-laws appointed by the president: J. G. Lumbard, S. S. Pembleton, J. H. Broomell.

Committee on nominations: F. H. Hall, L. M. Potter, C. W. Gould.

The following resolution was offered by Mr. Broomell:

Resolved, That the Association of the Illinois Dairymen's Association

appoint a committee of three of its members to confer with the State Board of Agriculture, in reference to the giving to the dairy interest a large recognition hereafter, in the annual fairs held under the care of said board. Motion to adopt seconded and carried.

The following delegates were nominated and elected by the convention: C. C. Buell, Rock Falls; J. H. Broomell, Aurora; R. P. McGlincy, Elgin.

Convention adjourned to meet at 2 o'clock p. m.

Convention met pursuant to adjournment at 2 p. m.

THE SIGNS OF THE TIMES AS RELATED TO THE MANUFACTURE OF BUTTER AND CHEESE.

BY J. H. BROOMELL, AURORA.

The *fool* will stupidly go forward in pursuance of a course guided by avarice and controlled by prejudice, regardless of the shipwreck which must inevitably carry him to destruction.

The *wise* man will carefully note the signs of the times about him, draw from the storehouse of experience and compare the present with the past to enable him to determine upon a wise course for the future.

The theme about which I shall speak is one of great vital importance to the dairy interest of the northwestern states, the region so emphatically wedded to the combined system of manufacturing both butter and cheese from the same milk. It is clear to me that the course of the wise man applied to this system will mark out a new departure for the future. For a number of years past we have heard high-sounding prophecies from numerous Isaiahs about the fate of skim cheese. Each year was to see the last of this troublesome commodity. The man who would be daring enough to make the stuff the following year would surely meet with financial disaster. The dealers said they were a curse upon their heads from the beginning to the end of their weary efforts to bamboozle somebody into buying them. The consumer said they were only fit for grindstones and fish-bait, and were always indignant when they found themselves worse sold than the cheese which they bought.

Notwithstanding these anathemas their manufacture has continued down to the present time. The factory men have freely admitted that these goods were ofttimes very undesirable for human food, and have wondered why consumers could be induced to take them at any price. Then why were they made? some one asks. The answer is easily made. They were made because it paid to make them. At the price skim-cheese were sold previous to the year 1883, no factoryman manufacturing either butter or full cream cheese alone could pay the prices for milk which were paid by other factorymen who made both butter and cheese from the same milk. The factorymen who paid the biggest prices got the milk, hence the desire which did exist to make good cheese was crushed out and extinguished by the competition with butter and cheese factories.

Moreover, the quality of the skim cheese made has been going from bad to worse. Some years ago the poorest quality of skim cheese, as to stock,

that were made during the summer and autumn were the half skims, which, as we generally know, were made by mixing the night's milk with all its cream with the skimmed morning's milk. No one thought of holding milk forty-eight hours and skimming from it four pounds of butter to the hundred, and then using the blue skimmed milk for cheese making. That is a modern thought, and arises from the adoption of the motto: "Whatever is worth doing at all is worth doing well." The old-fashioned half-skim was a pretty good cheese, and suited a certain trade well; but the standard half-skim has practically vanished as a commercial commodity, as there are not enough of them made at any time of year to be worth noting. Occasionally a factoryman will strike in and make a few good part-skim cheese, but not with sufficient constancy to establish a trade for them at paying prices, and the result is he is often "left" in his dividends by such a venture.

A survey of the field shows that it has paid to make skim cheese at six to seven cents per pound in the summer, and eight to ten cents in the winter; but I firmly believe the time of such summer prices is past. The summer of 1883 showed us prices which are convincing to the most skeptical. With cheese selling for three months at one, two, three and four cents, and a large part of it barely paying the manufacturers' commission, leaving nothing whatever to the dairyman for the value of his skimmed milk, is startling enough to cause all parties to the transaction to stop and consider. Were this an exceptional year, and prices low because of the depression in the commercial world, we might reasonably hope for a revival of the old figures. But such does not seem to be the situation, as illustrated by the prices of butter and full-cream cheese. They have found a ready outlet at figures but little below those of former years. No, the trouble does not lie in commercial depression, nor yet in our over-production of dairy goods. It is a solid, indisputable fact that our skims have become so bad and worthless that there is no longer an outlet for them during the summer, when good cheese are plenty at prices that will pay to make them.

The southern trade is limited in the summer and don't want them anyway, having learned the difference between a good quality and a poor quality of cheese. The export trade has tried a good many of them the last few years, because they were cheap, and has become sick of the bargain. No more are wanted across the water except at prices at which we cannot afford to make them.

The writer lately received account of sale of fifty-one boxes of flat June cheese weighing 1,650 pounds shipped to Liverpool in August last. Net proceeds of the lot, $3.02, the commission man in Chicago, to whose house they were first shipped, making no charge for his trouble in handling them. This is quite a fair illustration of many shipments made to Europe during the past season, all of which goes to prove the point made above.

No greater insult can be offered to the home trade than a proffer of skim cheese. No one will have aught to do with them, not even with tolerably good skims. The word "skim" at once raises a suspicion of theft and puts all such cheese under disgrace.

In viewing the field I am unable to see any outlook for the better, and I think it wise to accept the situation in 1883 as a criterion for the future. That being settled, what should be the future policy of butter and cheese

manufacturers? I should make this outline as safe counsel to follow for the year 1884, making such changes for the better thereafter as experience may suggest: Do not manufacture a single skim cheese from the 20th of May until the 1st of August Between those dates turn all the milk into either butter or full-cream cheese, allowing the skimmed milk to go back to the farms to be fed to the needy calves and pigs. After the 1st of August, for two months it might be safe to venture on good half-skims, and still later to make a twenty-four hour skim; but it is wise to discontinue for all future time the now common practice of holding milk forty-eight hours, or longer, and then turning the skimmed milk into cheese. This outline, I think, if followed faithfully by the factorymen, will place them upon safe ground.

It is no longer a matter of choice with them as to whether they will adopt it. They must do it or lose their patronage among the dairymen, as I will try to show. Another such season as that of 1883 will scatter the milk away from the butter and cheese factories and send it to other factories making full-cream cheese or butter alone; and some will be kept on the farms and the cream sold to cream-gatherers.

Dairymen will not, during another season, give the skimmed milk away to cover the cost of its manufacture into cheese. They have had a lasting and sufficient dose of that kind of medicine. Factorymen must assure them that no such mismanagement will be suffered hereafter.

It is the money consideration which forms the clinching argument in this case. Most butter factories made better dividends for June, July and August, 1883, than did the butter and cheese factories, and in the first instance the dairyman got his skimmed milk back for home feed. The full-cream cheese factories beat the butter and cheese factories for the same period from ten to twenty cents per hundred, so you see the money argument is directly opposed to the skim cheese.

But, some factoryman says he cannot afford to run his factory on butter or full cream cheese or both at the usual commission charged for manufacturing. I answer that he can better afford to do that than to lose his business. His relations with the dairymen are somewhat mutual, and he must manage his business in such a way as to protect the interest of the dairymen or he cannot expect to hold them as patrons. Moreover, the expense of running the milk into full cream cheese or butter alone is less than that of making it into butter and cheese, hence the point is not well made. If the manufacturer *cannot* afford to operate his factory on the usual commission of two and four, he had much better raise the price of making than to place upon the market a commodity that nobody wants.

Is there danger of overstocking the market with butter and good cheese? Most certainly, no. The market for both during the summer of 1883 was a healthy one regulated, mostly, by the law of supply and demand. It was less affected by speculative forces than during the summer of 1882. Butter settled to a price during mid-summer which enabled exporters to operate to a considerable extent, and furnished inducements to cold-storage men to lay in a reasonable supply. The first was consumed speedily on the other shore. The last has been going out gradually during the autumn months at reasonable but paying prices. Thus the surplus make was cared for, yet the price did not go so low as to discourage the dairymen.

Full cream cheese brought satisfactory prices during the summer. The export demand was active during the spring and early summer, but was somewhat checked later by the sharp advance in this country. We find no more stock on hands now than will be taken between this and the coming of the new make of next season, and the prices are high and likely to advance. This state of the butter and cheese market I regard as a good omen for the future. I see no reason why it may not be enduring. Nay, more; I think it can be much improved. Take out of the summer's make seventy-five days' production of skim cheese and it leaves a large vacancy to be filled with good full creams. And this is not all. Our home consumption, if not at a standstill, has not increased with our growth of population, owing, no doubt, to the distrust that exists as to the quality of American cheese. Many families that used to consume cheese now seldom have it upon their tables, owing to the difficulty of obtaining a satisfactory article. Should this be removed there is no question but that our home consumption of cheese could be doubled in a short time.

This could be done without expecting our people to become equal to the English as a cheese eating population, for such will not be while meats of all kinds are so cheap in this country. With a greatly increased home consumption, and with the export trade standing ready to take a goodly supply when prices are low enough to offer inducements, I see no need of fear of an overproduction of good cheese.

Furthermore, it is conceded that our worthless skims must be consumed, if consumed at all as human food, while they are yet young. This fact cuts off all chance of holding for future use by cold storage. Not so with full creams. They can be held successfully from July clear into the winter and come out as fine as a fastidious taste could ask for. I *know* this can be done, having recently been using upon my own table July cheese made at La Fox by Potter & Barker, which is very satisfactory. This I consider a strong plea in favor of good summer cheese.

The consumptive demand for good butter is continually on the increase in this country, while the poorer sorts are as certainly neglected. The high price of the good stands not in the way of its consumption. Our people are no longer poor and compelled to eat cheap butter or none. They want the best and are able and willing to pay for it. Taking this fact and putting with it our natural increase of population and adding to that our wonderful immigration from the old world, we can see a magnificent opportunity for the absorption of our dairy products. There certainly can be no danger of an over-production of good butter and good cheese.

Let us now consider this question: How shall the manufacture of butter and cheese during the summer months be distributed among the different factories? In discussing this question we must consider the urgent needs of the heavy dairy sections of the northwest in the matter of recruiting the dairy herds.

It is a constant regret among good dairymen that they cannot successfully raise the calves from their best milking stock, while they supply milk the year around to butter and cheese factories. At least they incline to think they cannot do so without loss in dollars and cents, arising from retaining a portion of their milk for their calves. As a result, most dairies in the region

referred to are recruited by importing cows from other states, a system both expensive and uncertain.

Now, if it were generally understood by dairymen that skimmed milk, in good shape for feeding to calves, could be had in such quantities as demanded at an equitable price, it would solve the question as to recruiting the dairies. I use the words "equitable price" because a price must be fixed upon the skimmed milk from month to month to make it equitable to those patrons who do not take skimmed milk, and to adjust the difference between those who take a larger or smaller quantity. I might suggest some plans by which this price could be fixed, but will not trespass upon your time to do it.

While this plan of furnishing skimmed milk would cause some trouble and expense to the factoryman, it is a matter that must be conceded for the good of the dairy interest, but it will react in time to the benefit of the manufacturers through a greatly increased patronage of the factory by a class of small dairymen who have felt that they could not spare their milk from the farm while raising calves.

The supply of skimmed milk should be flexible and varying, according to the demands of the dairymen. This could be easily done by knowing what patrons would want milk and how much. All other milk should be run into full cream cheese. Then, as the season advanced, and other and cheaper feeds were substituted, the manufacture of part skim and full skim cheese could be undertaken, as the outlook might indicate. By the middle of August, with no hard skims in the way, we might look for an active market for a good part skim cheese.

From present indications I incline to believe that the centrifugal separator will prove a valuable aid to the skimming process at all seasons. It may present the advantage of furnishing skimmed milk to the farmers in good shape for calf feed, much of it being returned to them on the same day as its delivery to the factory.

I regard this system of supplying skimmed milk from the factory as the most feasible plan of overcoming the great waste which is liable to occur from either one of two causes, namely, that of making skim cheese at a season when it cannot be sold, except at extremely low prices; secondly, that of retaining the entire milk on the farm and selling the cream.

A little thought will convince an unprejudiced farmer who sells his cream for twelve months in the year that he actually wastes his skimmed milk for at least half of that period. For six months of the year he has no pressing need for it and feeds it to whatever stock will consume it, only because he has it on hand and must dispose of it in some way. When skimmed milk is worth fifty cents per hundred to put into cheese he cannot afford to use it for pork-making with corn at fifty cents per bushel and pork at $4.50 per hundred.

Any thinking man knows that a bushel of corn will make more pork than a hundred weight of skimmed milk. Hence I am free to say that making skim cheese through the summer and selling cream the year around are both systems of wastage. It is equally true, I think, that whatever inroads have been made upon the territory of butter and cheese factories by the gathered cream system have had their cause in the inability of the stock raiser to get skimmed milk when most urgently needed. Should factorymen recognize

this and meet the difficulty as I have suggested, the furore for selling cream which has swept over some of the factory districts would soon subside.

I regard the gathered cream system as a pioneer arrangement, well suited for new and sparsely settled states, but it has no place, properly, in the old dairy sections where farmers can conveniently reach some butter and cheese factory.

It has been suggested to me that factorymen are powerless to carry out these urgently needed reforms because there can be no concert of action; that if a few attempt it they may have the misfortune to be eclipsed in their financial returns to their patrons by the many who keep on in the old way.

I answer, there was a time when there was some force in this assertion, but that time has passed away as I have clearly shown. The profit is on the side of him who avoids the old way and adopts the new. This being the case we may expect the multitude to come over to our side without any particular arrangement for concert of action. They must come; it is a fore-ordained necessity. Let me recapitulate:

Make no more skim cheese during the summer, say from the 20th of May to the 1st of August—seventy-five days. Turn the milk during this period either into butter or full cream cheese.

Make good goods and there will be a ready market for them at paying prices.

In the stock raising sections furnish skimmed milk to the patrons in such quantities as needed at equitable prices.

In the autumn make a good half skim cheese; in the winter a good skim, nothing poorer.

Work according to the needs of your locality, studying somewhat the interest of your patrons, and the result will be a larger production of milk.

With the worthless cheese out of the way; with a steady increase of our home consumption of dairy products; with the export trade standing ready to take any surplus of fine butter and cheese that we may make, I regard the future outlook of the dairy interests of this country as promising in the highest degree; and nothing but a short-sighted, selfish policy on the part of those most interested can prevent the people of the United States of America from becoming the greatest producers and consumers of butter and cheese among the nations of the earth.

Governor Hamilton entered the hall at this juncture and was introduced to the Association, and spoke as follows, for a few moments:

Mr. Chairman, Ladies and Gentlemen: I have been advised by your chairman that he simply desired to introduce me at this time, for the purpose of informing the people that I had arrived. I have been notified that I was expected to deliver an address this evening, and I shall endeavor to perform that duty as best I can. I shall only say, therefore, that I am very happy to meet you, and happy to make many valued acquaintances during my short stay with your convention. In examining and thinking about the matter in which you are so much interested, I am glad that the State of Illinois has officially recognized the physical and financial fact that your interest is amongst its greatest and most important, by, in some small measure at least, recognizing the importance of your organization; and, so far as my wishes are concerned, so far as my actions shall be concerned, as all other

enterprises of this great State in which we take so much delight, shall have my special attention and special care. I am much surprised as well as pleased to discover the extent of your industry and enterprise, to discover the enthusiasm with which it is conducted, and the remarkable success which it brings to those that are engaged in it.

But there are some questions connected with the subject which I hope to discuss to night, if not in a learned or practical way as some of you farmers could do who have been engaged in it for many years, I hope at least to draw your minds, direct your attention to some points which may interest you and entertain you, if not instruct you and inform you.

Again I thank you for the courtesy of your invitation, and express my sincere and heartfelt pleasure at being permitted to meet with you and become acquainted with you, and lend whatever personal and official assistance I can to the success of your organization. [Applause.]

"TRANSPORTATION AS RELATED TO PRODUCTION."

BY J. G. LUMBARD, OF CHICAGO.

Mr. President and Gentlemen of the Convention: The subject proposed for your present consideration is one of universal interest and universal concern. The expense of transportation is a part of the original cost of your goods, and their production is cheap or expensive, not according to their cost in your own bins and cellars, but according to the cost of placing them on the market. It is at the feet of the purchaser that your outlay ceases. Isolate yourselves from the markets of the world and confine yourselves to a strictly local, home demand, and, beyond your individual and family needs, your product is worthless; and the time, labor and money expended upon it is time, labor and money wasted. It is to the dairymen of the West just as much a necessity to have a good carrier as a good cow—just as indispensable that transportation should be cheap as that labor and feed should not be exorbitant, for it is in your ability at this distance from the market to compete with those nearer, that makes your calling possible and your efforts successful. The proposition argues itself and needs enforcement by no illustration. Your bushel of wheat or pound of butter, whether in Ohio, Illinois or Iowa, is worth precisely the New York price—less the cost of getting it to New York.

Formerly, when our population was sparse and the volume of our production inconsiderable, it was the rivers and the lakes that constituted the highways of commerce, and up to a certain point these facilities seemed sufficient and satisfactory, but as the population of the country became more dense and their production proportionately augmented, these facilities were found inadequate—inadequate not so much from lack of capacity as through lack of speed and certainty—and the active and aggressive enterprise and push of the American mind could illy brook the tortuous paths and certain uncertianties of water communication, and so it came necessarily about that search was made by the minds of men for a better, speedier and surer means of transportation for themselves and their products.

From out the travail of men's need was born this commercial prodigy which we call a *Rail Road*. From out the necessities of commerce sprang

this now familiar miracle, and it has been reproduced and multiplied in the interests of the people and to aid in the development of the material industries of the country. In other words, the railroad was devised, established, and has been maintained in the interest and for the benefit of agriculture and commerce, and to advance these by lessening the cost of each. That the water-ways of the country still exist and are in comparative disuse is proof of the superiority of railway facilities.

If, then, a single railroad is an advantage to a people, the multiplication of roads is a multiplication of advantages, and it follows as a necessity of reasoning, that the welfare of the people at large is best subserved by measures tending to the increase and permanence of these artificial highways.

Much public and individual discussion has been had, aforetime, touching the advisability of controlling these roads by State authority, but the world has yet to discover the first man in favor of their abolishment.

Fairly construed, this fact may be taken and stated as an universal assent to their utility and value. It constitutes an admission that the true policy at this juncture is to adopt such measures as shall tend to the further extension of such roads as you now have, and the projection and construction of others. You will please note that I am now speaking from your standpoint and not from the standpoint of the roads themselves. For the owners there may be railroads too many—for the patrons there must ever remain too few.

The establishment of a second livery stable in your town not only gives you larger accommodation and surer service, but it secures you against excessive charge by the competition inaugurated. Precisely the same thing is true of railroads. Competing lines enable you not only to choose your route, but each road protects you against extortion by the other. That the presence of a railroad is understood to be an advantage and a convenience to the people, we have proofs on every hand. Counties and towns tax themselves to secure their construction. Cities and citizens donate land and money to build depots. Did anybody ever hear of a county or town taxing itself to procure the removal of a road, or a bonus being offered for the demolition of a depot?

No, Mr. President, we look in vain for opposition to the presence of a railroad, and every cry coming up from the people is a cry of invitation. If, then, an increase of roads is desired and desirable, it must follow that measures calculated to deter or retard their construction are unwise and disastrous. The question, then, is, *How to encourage construction*, and this question may be in part answered by showing how their construction may be discouraged.

If there is one thing which, more than any other, must tend to dishearten capital and prevent its investment in enterprises such as we are now considering, it is the much indulged threat of placing the railroads of the country under either National or State control. The owners of money in New York and Boston, as of England and Germany, are not unlike the rest of mankind in their desire to handle and control their own means, both after as well as before investment, and which of you would sell your farm and your cattle and put the proceeds into something over which you could never again have any control? If money in railroads is to pass into the hands of those in no-

wise interested in its employment, and who are indifferent as to whether any return is ever earned or made, will not the fact deter further investment in the same thing?

However arrogant, purse-proud, and overbearing the millionaire, his money is sensitive, diffident, apprehensive and filled with fear. It hides in dark and secret places; it buys iron bands and safety vaults to prevent intrusion and pillage. But money burglarized from an iron safe or a safety vault is not more lost to its owner than is money taken by the legalized larceny of legislative confiscation, and to threaten it with this danger is to drive capital to safer quarters in safer enterprises. You cannot have both sides of the bargain—the two ends of the stick—and you cannot get stranger aid to build a railroad to your farm, if you announce in advance your intention to deprive its owner of his ownership in it.

Capital has not yet become so imbued with the true missionary spirit as to be willing to sacrifice itself utterly to the good of others, and whosoever shall count upon procuring for himself the advantages capital is competent to supply, must first consent to a fair division of the profits as between himself and the actual proprietor. The owner must have a share in the profits of his investment, or no investment will be made, and his corroding dollars will lie indolent and useless, while the besiness of the country suffers such stagnation and depression as is sure to follow the locking up of capital from active employ.

This is one of the results to be apprehended from an enforcement of what is known as the policy of the Grange. Its adoption as a settled policy of the country must operate to cripple and obstruct that system which has proven the most helpful and powerful aid yet discovered for the development of the material interests of the country, and the grandest and most beneficent influence ever operative in the cause of American civilization. It conquers by peace, it unifies by mutualizing interests, it consolidates by erasure of local and sectional differences, and, in short, makes of all the people of the nation one family, and of all its powers one force.

And in the case under consideration—let it not be forgot—the unfortunate and unusual thing happens, that the *threat made* is just as bad as the *threat executed*. The hunted stag flies from attack not only, but from danger, and timid capital, like the timid hind, flees from impending peril, whether near or remote. And so it comes about that, without pushing your policy to adoption, and without reaching any of the advantages hoped and claimed for it, you have by recommendation only, defeated enterprises calculated for your advantage, and postponed that general prosperity which is the sure prophecy and promise of our extensive territory, varied climate, diversified industries, and above all, of our free and labor-encouraging institutions.

It will be urged that governmental interference does not propose to go to the length of assuming proprietorship, but stops at demanding control of the roads. To this I reply, that to take control of property is to take the property itself, for control is of the very essence of ownership. It is the one thing that gives to ownership any value, and to the word a meaning. One cannot conceive of ownership without the right of disposal, and it is a contradiction to say that proprietorship may reside in one person, and control

be held adversely in another. What should be said of your ownership in the farm you occupy and till, if some stranger might dictate what crops you should raise, and fix the price at which they might be sold? You would refuse to pay taxes on land held by such a title. And yet this is precisely what you propose for the roads, when by legislative interference or otherwise, and against the will of their owners, you assume to fix tariffs, arrange schedules, and establish laws for their guidance and control. Let us look a little more closely at this.

The thing we call a "charter" is as much a law as anything the legislature is competent to enact, and when accepted constitutes the contract under which the road is built. When this contract is signed, or this charter accepted, which is the same thing, the right of the respective parties becomes fixed and determinate, and thenceforth neither party can change nor modify any of its provisions without consent of the other—that is, without a new agreement. If this be so while yet the contracts remain executory, how much stronger is the reason why it may not be changed after the contract has been performed by the other party. To do this is to violate the contract, and sugar-coat the pill with any sweet name you may select, the medicine is repudiation; and it makes the matter rather worse than better that the party avoiding the contract is a sovereign state instead of a private individual.

There is yet another defense sometimes made to the policy I decry. Man is fruitful in argument always, and there never will be a short crop of talk so long as one man by argument may hope to obtain another man's money. The defense to which I now allude may be called the defense of *legality*.

"The law so reads, and the courts so decide," is the burden of their speech if not their song, and has been since the deed on Calvary—done according to the law. If I remember rightly, it was to the law that Shylock appealed for his pound of flesh—and appealed successfully, until he bit off more than he could conveniently swallow. It was the law that strangled witches, and it was the law that, under the colorless pretense of color, held the blacks in bondage on our own soil; and it is the law that, under the specious pretense of control, now plans a theft of the railroads, and proposes to turn over their beneficial use and enjoyment to any and everybody but the owner.

But this defence of legality is faulty in another regard. The law to which you now appeal was not the law under which the charter was granted and the road built. Had it been, the road would never have been built, and you would be still hauling your grain in a cart, and going to market on a stone boat.

The law to which you appeal was an afterthought, and enacted to give you something you did not before have. Men do not go a gunning for game already in their larder, nor appeal to a legislature for that which they already have by charter; and if by legislative intervention they gain an advantage they did not before possess, they gain it at the cost of him from whom the advantage proceeds. And if in this case something is obtained beyond the rights reserved by the charter, it is gained at the expense of the other party, *i. e.*, at the expense of the railroad company, and no amount of special pleading can overslaugh the plain logic of the facts.

There might be a show of fairness in a proposal to purchase the roads and operate them by the state for the general good, but state control of property

that does not belong to the state is obnoxious to every notion of justice, and indefensible on any ground of common honesty; and that it is done according to law, does not inject honesty into the transaction. It is only in time of war when every interest is properly subordinated to the supreme purpose of saving the life of the nation, that the forcible interference with private rights can be tolerated by a free people.

Many persons doubtless understand and interpret the word *law* as another name for *justice*, and indeed the words should be synonymous, for it is revolting to think of wrong legalized; but the fact remains that laws are of human origin, and blemished by human infirmities, while justice is heaven-born and pure as its source.

It does not, therefore, necessarily follow that a thing is *right* simply because the law so provides. Nor can the decision of any court make that honest which in itself is dishonest. Judges, who interpret and enforce, are not different from those who draft and enact laws. They are human also, and imperfect also. All the wrongs I have already mentioned were perpetrated not only according to the law, but their enforcement was put in motion by the enginery of the courts.

And so, Mr. President, I find occasion, if not justification, for insisting that it is no answer to a charge of plain injustice to say, "the law so provides and the courts so hold."

But, lest I be misunderstood as recommending resistance to law and revolt against its enforcement, let me plainly say that I am in favor of neither, and am in favor of perfect obedience to the statutes of the land and the highest respect to the decisions of the courts, so long as the one finds a place in the statute book and the other remains unreversed; for otherwise we must have anarchy where order is indispensable. But I address my argument to neither makers nor interpreters of the law, but to the people, which in this country "is the power behind the throne, stronger than the throne;" and to that public opinion which makes the law-maker and judges the judge. With the sentiment of the country on the side of honesty, we shall find infrequent occasion to either sustain or oppose unjust legislation, for the enactments of the legislative body, with rare exceptions, reflect the views and policy of the people.

My argument has proceeded upon the assumption that, whether or not they be profitable to their proprietors, the railroads are of undoubted advantage to the communities through which they are operated, and it were doubtless a sufficient enforcement of this assumption to say that the use of these roads by the people is in no case compulsory, and every citizen is at the largest liberty to go on foot or on horseback, and to convey his freight on his shoulder or in his saddlebags in spite of the railroad, and that he may protect himself from any threatened hardship and every possible injustice by simply letting it alone; but I prefer briefly to show something of what these roads have in fact accomplished toward the development of the country and the prosperity of the people.

As I have before in substance said, transportation is a burden upon production—a necessary burden to be sure, but none the less a burden. To reduce its cost is to lighten this burden, and add so much to the profits of the producer. Now, it is matter of statistics that the railroads of the coun-

try, during a period of twenty years last past, have saved to the people, in the single item of freight reductions, a sum larger than the total of our national debt. This is a strong statement, but easily proven by reference to the annual reports of the various railway companies. The Rock Island road alone has thus saved to its patrons within the past fifteen years more than eighty-six millions of dollars. Add to this the showing of other companies, and you have the enormous sum first mentioned. I had the good fortune sometime last winter to notice a series of very able articles on this subject in the Chicago *Times*, in which the figures were given and above results shown. It has not been convenient to lay my hand again upon these figures, but they are accessible to those caring enough to consult a file of that paper.

The Pennsylvania railroad, with which I am in a humble way connected, and which has the largest tonnage of any road in the country, affords a further illustration of the reductions mentioned. I am in receipt of the following figures from our Auditor's office in Philadelphia, showing the average earnings per ton per mile for the years mentioned :

1862, 2.038 cents per ton per mile.
1872, 1.416 " " "
1882, 0.817 " " "

Or a general decrease in twenty years of 60 per cent.

The difference per cwt. between the rates in 1863 and 1883, from Chicago to New York, by same road on articles enumerated, is as follows :

	GRAIN.	FLOUR.	PROVISIONS.	BUTTER & EGGS.	CHEESE.
1863.....	$1.00	$1.00	$1.00	$1.55	$1.55
1883.....	.25	.25	.30	.70	.60
Decrease...	.75	.75	.70	.85	.95

The above representing a general decrease of 66 per cent. Now, the money represented by these reductions has been just as much earned by leaving it in the pockets of the producer as if it had been taken out and returned. We have earned this by saving it, and the country is richer to this extent. Add to this already enormous sum the enhancement in value of private and public lands brought about by the railroads which penetrate and develop them, and you have a result too large for computation or conception, and these are but a portion of the benefits derived through an agency everywhere contemned and complained against. The showing I have made is but a recital of plain facts of our history. They are parts of the nation's experience. But experience is also prophecy, and who shall say that an agency so beneficent in the immediate past must be abandoned or hindered in the future.

I have spoken to you of this marvelous and now indispensable agency only from the standpoint of the utilitarian, and only of its effect and influence upon the material prosperity of the country, for I have not felt called upon nor, indeed, at liberty under the implied limitations of my text, to say anything from a broader standpoint and better view. Of its utility as a means of defense in time of war, of its civilizing power in the distribution of knowledge, of its elevating and refining effect upon society through the familiar intercourse and interchange accomplished by it, I have said nothing; but, supplying as it does to the bodies and souls of men from day to day

the very necessities of living and of life, the railroad has become itself a necessity. Its iron bands constitute the pathway to every home, and its engine the swift and tireless messenger that fetches and carries for every household and every soul in the land; and he who shall stand blindly and selfishly in its way must stand also blindly and ignorantly in his own.

MR. RICE: Why do the railroad companies charge the dairymen of this section sixty cents a hundred for cheese, and the farmers twenty-five cents a hundred for their wheat?

MR. LUMBARD: There are several good reasons for that difference in rate. In the first place, the railroad company is an insurer of the property on its hands. A cargo of cheese is worth much more than a cargo of wheat, if it is lost. Another reason is, that cheese is perishable property, requires extra speed and extra care, ordinarily has to be shipped in a refrigerator car, which weighs 40,000 pounds, and it costs more. It has to have special care at both ends of the line. If it is lost, we have to pay more. You cannot carry a carload of diamonds from here to New York as cheap as you can a carload of paving stones.

MR. HOARD: To carry $2,500 worth of wheat, you compel the railroad company to build six cars; to carry $2,500 worth of cheese they can do it in one car, and the farmer never should be fool enough to compel the railroad company to build six cars to transport product that he can get transported in one car. This is why there should be more dairymen and less grangers. That one item alone, gentlemen, in the saving of the cost of transportation, between the cost of a dollar's worth of cheese and a dollar's worth of grain, is enough to settle the question.

You have no business to look at this question in any other way, except with respect to the unit, the dollar. There is a saving on transportation alone of 19 per cent.

THE PLACE OF DAIRYING IN ILLINOIS AGRICULTURE.

BY G. E. MORROW,
PROFESSOR OF AGRICULTURE, ILLS. INDUSTRIAL UNIVERSITY.

The rapidity of the development of the American system of associated dairying has been marvelous, even in this country of marvelously rapid development of so many industries. In many of its features our system of dairying is distinctively American. Twenty years ago the factory system of manufacturing cheese and butter was only fairly beginning to attract attention. Then dairying as a leading branch of farming was confined to a limited area. Now dairy farming is a leading feature in the agriculture in many states, and is successfully pursued over wide areas where it had no shadow of a foothold a few years since.

I see no reason to change my often repeated opinion that no branch of American farming, employing any large number of persons, has been so uniformly profitable as has dairying where it has been intelligently conducted. It is doubtful if any class of meetings connected with agriculture have been better attended, more intelligently conducted or more effective, than have the conventions of dairymen. In few branches of agriculture have there been equally striking changes in practice in so short a time. In none has co-oper-

ation, in some form, been so largely made use of. So far as cheese making is concerned, private or farm manufacture is almost a thing of the past. The old system of shallow setting of milk has largely been supplanted. To-day many of us have seen in successful operation one of several kinds of centrifugal cream separating machines by the use of which it is quite possible to have butter ready for the table within an hour from the drawing of the milk from the cow.

The great reason for this rapid development has been, as has been indicated, that the business has been found profitable. Some of the reasons for this are easily seen. In an unusual degree, dairy farming requires daily labor, care and intelligent oversight; when wisely given, these things usually bring good rewards. That they are absolutely necessary is a reason why many farmers "do not like dairying;" that they are cheerfully given is a reason why the average dairy farmer or dairy farming region is more prosperous than the average grain growing farmer or grain growing region. Dairying most successfully solves the problem how to reduce bulk and weight of farm products in proportion to value, thus best fitting them for transportation. In an unusual degree dairy farming is adapted to preserving the fertility of the soils of the farms, by causing the consumption of much of the produce grown upon them.

It is not strange, then, that dairy farming and manufacture has assumed so important a place and has spread over so much of the country.

Looking to the future, there seems good reason for hopefulness; although I do not believe there are to be, in general, equally large profits with those which have been secured in past years. It is hardly probable there will be any very great extension of area in which dairying will be the leading or almost exclusive business. While we have learned that it is quite possible to make dairying successful, in some one of its branches, wherever cows can be kept in health and with reasonable cost, it is also true that there are regions better adapted to the work than are others. The northern third of Illinois will long remain the chief dairy region of the state. The central belt will do more in the work than will the southern portion. There will be enlargement in Iowa, Minnesota and other western states.

The aggregate product of dairy goods in Illinois will grow much larger. There will be increasing attention to butter and perhaps to cheese making in regions where beef making or grain growing will remain the chief branches of farm work. We must remember that the great establishments are not all. We read with interest of the factories in which thousands of pounds of butter are produced daily; but we must not forget that there are 200,000 farms, and more, in the state, where at least a little is done in milk supply or butter making. We read with interest of such great beef making farms as those of Mr. Gillett, with his hundreds of high class beeves; but the mass of the beef cattle in our markets do not come from such farms as his.

The rapid growth of our cities gives increasing importance to the milk supply trade. Probably no other line of dairy farming gives equally large profits as does this, under favorable conditions. But the exceptionally hard work and annoyances inseparable from the business will always tend to keep down the number engaged in it.

Farm butter making, as usually pursued, is eminently unsatisfactory, and

yet, on high-priced lands, it is not usually profitable to keep a cow for no other purpose than to rear a calf. The system of collecting the cream for manufacture at a central factory, leaving the sweet skimmed milk for use on the farm, has many advantages for regions in which beef making is an important factor in farm work. I believe this or some like system will extend itself through the central belt of the state more readily than has the ordinary factory system. It is not probable there will be any rapid increase in cheese manufacture outside of what is known as "the dairy belt" of the state.

In any such connection as this my thought goes to the fact that we are seeing striking changes in the agricultural situation in our state and country. Illinois is ceasing to be a new state; is becoming one of the old states. We are now, comparatively, a state thickly peopled and with high priced lands. Competition is greatly increased. At least one half of the wheat and corn crops of the country grow west of the Mississippi river. The cheap and fertile lands of the farther west attract immigration in vastly greater degree than did our own in recent years. The rate of advance in the price of good farm lands in Illinois is becoming slow. Farmers must rely more and more on the profits from their farm work, and less and less on the rise in the value of their lands; and we must remember there is very, very little profit from "average" farming. One must produce more or better or at less cost than do his neighbors if his profits are to be large. It is to be less easy to make even moderate success in farming in the future than it has been in the past. There is to be more rather than less need for intelligence, energy and good management in farming.

Dairying stands in the front rank in its adaptations to these changed conditions. It enables us to get a large money return per acre; to concentrate much labor on a moderate area. It is noteworthy that there is increasing attention paid to combining good dairy and good beef making qualities in cows. A chief claim to public favor in behalf of each of several breeds of cows is their fitness for this double purpose. The dairy farmer may be, often is, a breeder of choice cattle, thus combining two profitable, most interesting branches of business. In the central belt of the state many farmers may profitably be dairy and beef making farmers. To more economical methods we must look for increased profits, and it is easily possible, by the uniting of butter making and cattle rearing, to more economically rear calves than has been the custom by general farmers.

It needs repeating that, in unusual degree, skill and intelligence are needed. It is fortunate that dairy farming, more clearly than most other lines of farming, tends to develop energy, careful observation, intelligence and correct business practice. Some years since I was much impressed with the hearty tribute privately paid by Governor Seymour, of New York, honored deservedly for his oft-shown interest in agricultural progress, to the great improvement consequent on the introduction of associated dairying in Central New York. There is room enough for further improvement; but it is not idle flattery to say that the dairy farmers of Illinois are among the very first in intelligence, education, energy and thrift.

There are difficulties in the way of future prosperity. The competition from the dairy manufacturing regions of the further west is serious. These states have some advantages over Illinois, as Illinois has some over more eastern states. But this competition can be met.

A more serious difficulty is in the rapid increase of manufacture of adulterated or imitation dairy goods. Mere denunciation of this does little good. I do not believe it practicable, were it wise, to attempt to prohibit the manufacture of such goods. I have no fault to find with those who make or who choose to use animal fat from one part of the body rather than another or from one class of animals rather than another. It is right to insist that these goods shall be sold for what they are. I believe it practicable to secure, in fair degree, compliance with wise legislation requiring this. This secured, dairy farmers ought not complain.

Another serious danger is in the possibility, perhaps probability, of the introduction of contagious disease among the dairy herds of the west. It is idle to deny that such disease has a limited foothold in limited areas in some of the eastern states; and so long as this remains true there can be no absolute safety for our western herds. An important national convention to consider this question was recently held in Chicago, and I earnestly suggest that this Association heartily endorse the wise, conservative action taken by it, in seeking to secure appropriate action by Congress under which such diseases may be eradicated.

There are many modes of helping the general prosperity of this interest. I need not tell most of you of the interest and value of such conventions as those of this and other dairy associations. They have done vast good in the past; perhaps most in the earlier years of the awakened interest. The best attended and most effective meetings now are, as a rule, those held in regions in which dairying is comparatively new. I hope this association will endeavor to become even more useful than it has in the past, by holding at least some of its annual meetings in places outside of what we recognize as the dairy belt; places where an active interest is only beginning to be felt.

There are a few good books on dairy matters worthy of wide circulation. There are many agricultural and some local papers that are able and willing to give most effective help. In no other way can intelligence be so cheaply and widely circulated as through the periodical press.

In former years I presented over and over again, until it became wearisome perhaps, the thought that dairymen should not only seek to supply the demand for their goods, but should seek to increase that supply. It is clearly true we have looked too exclusively to the foreign markets for our cheese. I am very glad to see here the interesting collection of samples of cheese of various kinds, brought by Major Alvord. The great mass of the cheese made in this country is after one model. We have a large foreign population, many of whom have been accustomed to cheese of other forms and appearance. It is wise to consult their tastes and prejudices. It is wise to attempt to produce cheese which can go to the family without being cut.

On another point I have written and spoken much—the value of fuller and more attractive exhibitions of dairy products. I much regretted that Illinois was not better represented at our great centennial exhibition. I did what I could to secure a creditable exhibition at an international exhibition in London. It seemed to be a capital opportunity, when a few years ago, an attempt was made to combine a dairy show with the fat stock show in Chicago. I earnestly hope that the proposal to again attempt this may be carried forward. To-day this exhibition is the best known of any agricul-

tural show in America. I believe it to be easily practicable to build up a valuable and every way creditable exhibition of dairy products; perhaps of dairy cows. This cannot be done in one year, nor can it be done at all if dairy farmers and manufacturers are too critical, insisting that every detail of management shall be in exact harmony with their own notions.

I have referred to the intelligence of dairymen and to the marked advance in dairy practice. There is room for much more progress in education and experiment. It is interesting to note the desire for a special dairy experimental station in the State. While the Illinois Industrial University, by the requirements of the laws under which it is established, is mainly a school for teaching rather than an experimental station, I am glad to say that it will be heartily glad to be of any aid practicable. It will try to give to any intending dairymen such education as may better fit them for their work, and to try experiments, answer questions, make investigations, so far as is practicable at any time.

Among the many great interests in this great State of ours which will long remain chiefly an agricultural State, dairying will long remain prominent, progressive and prosperous. I cannot flatter you by saying it will ever be the chief agricultural interest, but it need never have a less important position than it now possess.

Convention adjourned to meet at 7.30 p. m. same day.

Met pursuant to adjournment at 7.30 p. m.

Music by the band.

Essay:—

THE NEED OF SCHOOLS TEACHING HOUSEHOLD SCIENCE.

BY MRS. J. H. DAVIS, DE KALB, ILL.

Such a meeting as this gives the economist and philanthropist encouragement. Such a meeting as this makes us realize that we are making some advances over the age in which our fathers lived. A meeting like this shows that the dairymen of Illinois are thinking, and are thus not only developing their own resources and reaping rewards for themselves, but in doing so are becoming a public good—a national good.

It is not alone the dairymen of our land who are helping to advance the age in which we live, by becoming intelligent laborers. Men having kindred interests of all professions and trades are joining themselves into associations for the purpose of scientific inquiry into the causes and means of success in their business or professions. To-day as never before, men of all classes are becoming convinced that thought must be the companion of labor. Mechanics are no longer content with a few tools in unskilled hands. They must not only have fundamental training but books and papers and organizations to keep them informed of improvements in their arts and trades. Even the steady-going farmer so long content to do as his father before him had done is catching the spirit of the age and is studying the soil he plows, the nature of the plants he cultivates, the kind of stock to be raised for a given purpose, the food required, and numberless other questions connected with his work. Law-makers have foreseen the public need and good, and have been instrumental in establishing industrial schools

throughout the states of our country, where men can become skilled in the art or profession they may choose. The benefit of such schools cannot be over-estimated. Already the State of Illinois has scores of trained engineers and specialists where twenty years ago it had few or none, and they have been given to the State by the university she has endowed although but meagerly.

Until recently there was connected with this university a department which had for its object the teaching of Domestic Science or Household Science. Three years ago, for some withheld or unstated reason this course of study was dropped from the university role of colleges. Apparently, those in power did not understand the aims of this department or had no appreciation of the need of schools of this character. Whatever may have been the reason for their action the State has been robbed of a benefit by the suppression of this course of study. There has been removed from the State an influence which would have told for good as year by year a few girls, graduates of the course in Domestic Science, would have gone forth from the university, to be living powers in elevating the homes of our State.

Whatever may have been the faults and failures in this course of study they were but incident to the newness of the department and would have passed away in time. Whatever lack there may have been in its working and complete success was not the fault of the course, its aim or its advocates, but the fault of the soil in which the good seed fell; and be it said in praise of those who were the progenitors and defenders of this course of study, that they were deep and noble-minded and comprehended the greatest public and private need of our country—the need of better homes.

There has been of late an infinite deal said and written about the home. Orators extol its influences; lecturers frequently choose for their theme some topic relating to the home; there are home papers and home departments in almost every paper, and home books, containing full, able treatises upon every subject pertaining to the home. All of this is work in the right direction, but something else is needed.

There is a science of the household, and there are needed schools and fundamental teachings to inculcate its principles and prepare the mind to read intelligently and profitably the mass of matter now written for the home. The world needs to be rid of the very prevalent idea that housekeeping is intuitive to woman, that it is as natural for her to keep house as for birds to build nests. The world needs to learn. Woman herself must awaken to the fact that there are connected with the household practical responsibilities for which there should be a careful and thorough preparation, that housekeeping is an art or a profession which requires skilled hands and trained, educated minds as much as any other art or profession. Women must become convinced that their work as housekeepers is not what it ought to be. They must become convinced that a course of study in household science is the education needed by their daughters that they may become successful managers of homes. I do not wish to be understood that this is all the education woman ought to have. I believe she should be free to do or to learn what she chooses and has ability for; but inasmuch as nearly all women become housekeepers, education for this work should be fundamental. Education for this work is essential to the comfort, well-being and

happiness of our homes, and the state should make it possible for such an education to be obtained.

There may be some here to-night who will not be satisfied with the statements and assertions that I have made regarding the necessity of having better managed homes, and having schools or departments in colleges for household education. There may be some here to-night who would insist upon an inspection of homes before they would be convinced that something indeed is needed to improve the condition of our homes. Most cheerfully would I go with such a class upon a tour of investigation, and we would not have to go away from the city of DeKalb, I think, to become convinced that there are gross neglects and abuses in the management of our homes, and that the cause lies in the ignorance of the housekeepers.

We will form ourselves into a committee of inspection and in the first place, before entering the house, we will notice whether the yard and surroundings have drainage, either natural or artificial, sufficient to remove all surface water. If not, we shall be able to draw some conclusions in favor of our theme. We will next observe whether the house has a cellar. If not, there is danger of malaria; and even with the cellar we shall not feel satisfied with our investigation until we have been through the cellar. We will go down and see how the cellar smells, and see if it has a drain in good working order or any chance for ventilation, and inquire if it is ventilated; and not forgetting to look in the dark corners for half-decayed vegetables and piles of nasty rubbish of all sorts. As we come out of the cellar we might glance around the back kitchen door in quest of pools of dishwater and slops and kitchen leavings, and castaways of all kinds, which will be bad enough at this time of year, but infinitely worse in the warm, thawing days of spring, when such old piles and pools seethe and smoke, breeding sore throats and diphtheria as very vermin. If we find everything tidy about the back door we will step in and ask the housekeeper what she does with the kitchen slops. She may point us in pride of the convenience to a sink, but if we stop to examine it we shall probably find both sink and drain of wood, and if not we shall doubtless find faulty pipes, either actually leaking into the cellar or constructed without traps or means of ventilation, and then carrying the water but a short distance into the garden or into a cesspool seldom cleaned or with no means of cleaning. Although soil has purifying qualities yet there is a limit to its efficacy, and in time the very earth around such badly constructed wastepipes becomes a magazine of filth and disease. We must not forget to notice the locality of the well in our search for cesspools, how far it is situated from all contaminating influences, the kitchen slops, the heap of barn manure and the water-closet. And of the latter I will venture to remark that there are not three in the whole town that are constructed and cared for as they should be. I tell you there is a chance for much information and improvement in the management of drains, cellars, drinking-water, water closets and back-yards generally. To their mismanagement can be traced the typhoids, agues and epidemics that take husbands, fathers and beautiful children from their homes, leaving wives and mothers desolate, to learn too late the lesson of cleanly surroundings.

We may next observe the plan of the house and see if a woman having the health, comfort and happiness of the family, ease and convenience of

doing work, has had anything to do with the planning, or if it has been left entirely to the professional architect. We will count the south windows it contains, those best windows of the house that catch the sunshine of winter and the night breezes of summer, notice the system of heating and ventilation, bathing conveniences, and if the house be large we ought to find a laundry with fixed tubs and boilers, hot water and cold at easy command, and a drying room for stormy weather. Health, convenience and beauty should be considered in the construction of a house, and woman ought to have the training that would fit her to be the architect of her own dwelling in all vital and essential points. She should be competent to plan for heating, ventilation, water-pipes, drains and certainly to plan a sitting room so that the piano and couch will not be obliged to stand before doors or windows, and a sleeping room in which there is at least sufficient wall space to set a bedstead. It only requires a little thought to put doors and windows where they ought to be and leave spaces for large articles of furniture; but a house is seldom free from blunders in this respect.

We can extend our investigation in the kitchen and pantry, or perhaps sit down to dinner with the family, that we may observe the quality of food and the manner of its preparation. In this department of housekeeping we can very easily judge whether ignorance or intelligence bears sway. The meats, gravies, vegetables, bread, butter, dessert will all show whether the housekeeper has a knowledge of her work and whether she studies the health of her family by giving them proper nourishment. The raiser of stock is coming to ask himself the question, "What food do my young colts, calves and pigs require for growth and development?" Is it not a question which mothers should ask, "What food do my children need to develop their bones, muscles and brain?" We have but to look at the children of our homes—so many of them pale, poor, soft-boned, with black, crumbling teeth—to become convinced that there is something to be found in the mode of feeding children in order that we may have more finely developed men and women. The subject of foods, their selection, purchase, their preparation, the proper combinations for perfect nourishment, the actual food value of each article of diet, is one little understood by our housekeepers. They have inherited or acquired a way of doing, and it may or may not be right, for all they know upon the subject. What we want is an intelligent cook, one that can tell when the grocer imposes upon her willow leaves for tea leaves, or old tea dregs from hotels dressed up into an article sold remarkably cheap; one that can tell chicory and peas from coffee, tonka from vanilla, cornmeal from ginger, turmeric from mustard, and above all one who insists upon the best flour and sugar that can be obtained in these days of vile adulterations.

It would be a good thing if this committee of inspection would find out how many of the housekeepers are industrious and thoughtful enough to can their own fruit, and in glass jars too, not depending upon the too frequently lead-poisoned product of the canning factories. Somebody ought to invent a cheap, safe and reliable can for these factories to use, that we might be, and feel indeed free from the shocking effects of lead-poisoning often caused from the soldering used in those of tin.

The subject of dress must not escape our notice. Notwithstanding the constant improvement in this matter, and all that is written and said upon

it, we should yet, upon careful inquiry, be able to find but few healthfully dressed women and children. There is really considerable enlightenment at the present time in regard to this matter, but it is not sufficient to overcome carelessness, neglect and the long effects of habit. It is almost as impossible for woman to change her habit of dress as it is for the leopard to change his spots, except as regards the mere externalities of fashion. She is thus the slave both of habit and of change.

Thus far in our investigation of homes we have had in mind only that which is practical and essential in its nature. But we want to find our housekeeper something more than this practical manager we have been seeking. We want to find that to a thorough knowledge of practical and essential matters she has added the graces and refinements of household science. We want to find that she has a cultivated, esthetic taste, that she has made beauty a study, and understands the principles of correct form, harmony of colors and graceful proportion. As we walk through the yard we want to find that she has managed it with reference to beauty of landscape, that she has perhaps hidden a neighboring stable by a clump of bushes, while she has left exposed to view the gothic roof and spire of some distant church or has preserved for the eye the glimpse of a river, or some fine stretch of landscape.

As we enter the rooms we want to find in the tapestries selected that she has studied the rich colorings of Oriental nations; in the furniture used we want to see that she understands the principles of wood and metal construction; in the decoration of articles of furniture that she has acquainted herself with the Egyptian, Greek and Moorish elements of decoration; in the pictures, statuary and vases which meet our eye, that she has read the history and made a study of classic and medieval art; and in the arrangement of all that she has obtained a quiet, restful, pleasing effect, not the striking, overcrowded and confusing effects presented by so many rooms. The study of the esthetics of the household could not fail to interest every woman, and a very little time given to the perusal of such books as Dresser's Principles of Design, Owen Jones' Grammar of Ornament, Von Falke's Art in the House, would produce decided changes and improvements in the method of furnishing our homes.

It may be urged that we are picturing something ideal and impossible to be attained. We would answer that it is not to be expected that a complete and universal reform in the management of houses can be at once obtained, but this should not hinder us from taking forward steps in the slow, toilsome path of reform. The reform is needed. He who has thought upon this subject but the few minutes during the reading of this paper must be convinced that there needs to be a better practice of drainage; that there needs to be better planning of dwellings; that there needs to be better heating and ventilation; that there needs to be purer food demanded and better cooking; better dressing of women and children; and a better understanding of the beautiful and appropriate in the management of yards, the treatment of the exterior of houses, and the furnishing of interiors. There must be more knowledge and thought upon these subjects before reform can be reached. It is woman who ought to be most interested in this matter. We look to her as the maker and keeper of our homes and to her we must look to

be their reformer. We would like to see an association, an organization of the women of Illinois who had for their aim the improvement of the home. We would like to see what could be done towards establishing a school for girls in Illinois where thorough study and discipline in household science could be obtained. At least we would like to see the college of Domestic Science restored to our State University.

We need the influence of men, of our legislators, of our governor, in this matter. In your economic and reformatory measures, in your careful thinking and planning for public well-being and national prosperity, let some of your attention be directed to furnishing means for an education to girls that shall prepare them to be competent housekeepers. Let some of your influence be lent to the practical consideration of making better homes for the shelter and sustenance of human beings.

In this nineteenth century of thought and progress, in this day of intelligent artisans, mechanics, tradesmen and farmers, let us also have intelligent managers at the heads of our households.

Music, "Nancy Lee."
Song by Mr. Lumbard.

ADDRESS OF GOV. HAMILTON.

Mr. President, Ladies and Gentlemen: If Mr. Lumbard had consulted me, I should have selected the song which he sung first, in preference to the one he sung last, for this occasion. I have had the pleasure of hearing from him twice to-day, although not the pleasure of his acquaintance before. Once, in the address of this afternoon, and in the songs of this evening; and I must say, with due compliment to the gentleman on both his excellent performances, that I like his singing better than his speech. I have no doubt that after he has heard my speech, and when he hears me sing, that he will return the compliment by saying, "Bad as they both were, I like your speech better than your singing." I am accustomed, generally, to speaking to my fellow citizens of the state of Illinois extemporaneously. I dislike a manuscript very much, and I sometimes dislike it so much that I abandon it when I have once entered upon it. But on this occasion at least, honestly recognizing the fact that I knew nothing to speak of concerning the subject before this convention, I have reduced my extemporaneous speech to writing, and will try to use it with as much facility as possible under the circumstances, hoping not to weary your patience.

I thank you for the courtesy and kindness you have shown me in inviting me to be present at this convention, and I assure you that it is with great pleasure and interest that I attend. I am earnestly and intently interested in the examination and study of every great source of material wealth and prosperity to the people of this wonderful State.

I heartily congratulate you dairymen here assembled and the people you specially represent upon the successful establishment within a few years of a comparatively new farming industry which has already grown to amazing proportions, and is annually yielding many millions of wealth to those engaged in it. The dairy business, as carried on more especially in northern Illinois, has added a very healthy diversity to Illinois farm work, which is

in the nature of things, highly conducive to prosperity, and which opens up a new avenue of interest to the farmer and new hopes and comforts to his home.

The very foundation principles of general prosperity and business success among any people may be expressed in two phrases, to wit: a diversity of industries, and a systematic, intelligent conduct of every line of business in which the individual engages These conditions complied with, wealth and plenty among the people, is simply a question of time, perseverence, economy and honest work. Perhaps nowhere in the world has nature done more to provide for a variety of industrial enterprises than in Illinois, by planting within its borders such a rich variety of natural resources, which our people are learning more and more to comprehend and appreciate from year to year. Within my memory it was believed that Illinois must forever be purely an agricultural region, and that its agriculture must be confined to raising grain and meat. But in the quarter of a century past we have seen it creating and establishing line after line of profitable pursuits, until with its nearly 9,000 miles of railway, far surpassing in this regard all other States of the Union, it has become the center of the commerce and civilization of the continent as well as the geographical center.

Stretching from Lake Michigan on the north to the embracing arms of the two great rivers on the south, it has become the natural and actual highway of the Nation's commerce and the people's intercourse. It is like the substantial and only bridge over an unfordable stream to which all diverging roads must tend and over which they must cross. It is the keystone of the arch to the business of the country; the pivotal center upon which the material wealth of the nation turns. In this quarter of a century we have seen mines of coal and deposits of stone developed all over the State, and by the mouths of the pits and on our beautiful streams gigantic manufactories of almost endless variety rise, and by the musical clatter of the employed and happy mechanics' energy, and the curling smoke from many furnaces, proclaim to the world that Illinois is destined to be by nature and by practice a leading manufacturing State as well as agricultural.

To you, gentlemen, is due a very large measure of credit for introducing still another magnificent diversity of business interest, to add to the healthy energy and activity of the people. By your enterprise it is shown that the Illinois farmer need not necessarily depend solely upon the shifting chances of the seasons for his prosperity. That a failure in the grain crop is not necessarily disastrous to his living. And still further, you have demonstrated that he need not depend entirely upon the shifting manipulations of the market for profit from stock raising or grain producing, for you have established a farming enterprise which, in a large measure, is independent of the seasons, so long as blue grass and clover grows and water runs, the product of which, instead of being controlled and buffeted about in the markets by speculators and gamblers, itself controls and monopolizes.

Plato, the ancient philosopher and lawgiver, taught political economy to his people in a forcible manner by describing to them an imaginary and ideal republic. He first gave his romance a locality, a country, called on nature to supply it with all the natural advantages of soil, climate, wood, water, diversity of surface into woodland and plain, mountains and rivers,

with stone and mineral deposits in abundance. He then selected a proper number of able bodied people, and put them at a variety of pursuits, with a wisely adjusted balance between that class which engaged in agriculture and produced food and that class of consumers of food and producers of manufactured articles for wear and convenience in the mechanical pursuits. He had the smallest possible number of middle men and agents to transact the necessary business between the classes; made professional men, lawyers, doctors, and preachers out of those who were physically disabled or too lazy to work, and banished loafers and leeches. He then laid down a simple and salutary code of laws for them, founded on the first principles of justice and truth, and declared them a happy people. The experience of the centuries will never depart from the prophetic wisdom of the ancient philosopher. The prosperity and wealth of the nation depends upon a vigorous variety of its industries, all valued, fostered and *protected* wherever necessary in health and growth from arbitrary, dishonest or unnatural disturbances. This variety of enterprise among a people, and that theory of political economy which teaches it, only follows the laws of nature which she has plainly written upon her productions everywhere. The shifting winds, the varying seasons, the landscape diversified by mountain and valley, forest and plain, river and lake, endless variety of vegetable and mineral forms and productions, nay, even the perpetual contrast of the human form and face and character all teach the plain and unmistakable lessons of the true and healthy construction of the business of the people of a country in a healthy variety of forms. There are now and long have been those who differ with the teaching of the ancient sage. and the simple philosophy of nature, and who would allow unnatural, revolutionary and hostile causes to break down some lines of our great industries, in order that the business might be concentrated into a few pursuits in which all people would be compelled to engage. But it will be observed in the course of years that nature is older and stronger and wiser than these revolutionists, and that so long as the country is prosperous and happy she will stamp upon its business interest her favorite cast of an infinite and pleasing variety of industrial pursuits.

But gentlemen of the convention, your great success in the dairy business is largely due to an observance of and compliance with another of the primary laws of success which I have already mentioned, viz: an intelligent and systematic conduct of your business. This is plainly seen in your dairy farms, your neat, comfortable and well arranged barns, your constant scientific improvement of stock for dairy purposes, and your well organized manner of preparing your product and carrying it to market. Order was God's first law. It was the first force to assert itself in triumph over chaotic matter, and it is now, and ever will be the first power to be called into the uncertainties of man's purposes, if success is achieved. Its power is just as much but no more necessary in marking the courses of the stars and controlling the revolutions of countless worlds as it is in the growth and symmetry of a blade of grass. It is just as much but no more necessary in successfully managing the business of Nations and States as it is in managing the smallest or largest dairy farm in northern Illinois. Its presence everywhere is joy and peace. Its power in business brings wealth and comfort. Its touch is that of the magic wand which brings symmetry and beauty. In a recent

address to the fat stock raisers assembled at Chicago, I said among other things, "There is presented to you by force of circumstances the problem of how to make meat stock raising in the future profitable in Illinois in competition with the same enterprise on the cheap and as yet unsettled plains and prairies of the great Northwest and Southwest, where the investment in the pasture land, if purchased at all by the grazer, is only nominal, as compared with the investment now required in an Illinois stock farm.

"The capacity for producing meat cattle on the western plains in great numbers and at small expense has not yet been limited or bounded, and probably will not be for many years to come. And the ease and cheapness with which marketable cattle are produced in the west becomes more startling when we compare it with the cost of producing fat cattle on the farms of Illinois, which are already worth from $50 to $200 per acre, when you add to the cost of the production of the stock a reasonable interest on the investment in the land." I excepted, of course, from the difficulties of this problem such fat stock as must be fattened upon grain, such as hogs, etc., for the immovable centre of that production must remain in the great corn belt of the Mississippi valley.

It must be a very pleasing thought to you, as I assure you it is to me, that you dairymen have solved this problem for the farmers of Northern Illinois at least for the present generation, and probably for many generations to come. You have changed the farm and stock industry into a line which is beyond the reach of the competition of the western plains. For the dairy business is necessarily the child of civilization and dense population. It must flourish only on well improved farms and in well ordered, well conducted homes. It must flourish, where other conditions are favorable, nearest the centre of demand for its rich and perishable products, and where are these conditions more completely met than in Illinois, with her great commercial mart, Chicago, and her radiating, variegated and rapid lines of transportation to other great centres of population? Gentlemen, you may well be jealous of your position, your calling and your success. Masters of the situation, you produce in such large quantities and rich quality, that instead of your material interest being controlled by the market manipulators, *you* are able to control the market, and complacently take forty cents per pound for your butter, if you can't get more, and find ready cash sale for your cream, milk and cheese. In fact, when I go to pay my grocery bill and count up the item of butter, even in this great butter producing state, I almost feel as if the butter eaters ought to call a convention to put down the monopoly of the butter makers. "Monopoly," you know, is now the word commonly used to describe every business enterprise that is successful.

But, gentlemen, I do not envy you your success. You are justly entitled to its rewards, for your skill, energy and foresight and observance of nature's laws. Your success and profit in carrying on the dairy business on high priced farms will of course be materially enhanced by the application of scientific knowledge and methods of improving the breed of your cows, so as to obtain the largest and richest yield to the animal, kept at the same expense. But that superior class of intelligence which in a few short years has created such a great and profitable industry will no doubt be equal to the occasion, not only in improving the grade of dairy stock, but in adjusting all

other successful methods and useful appliances, by the quick eye of business perception and the enlightened intelligence of cultivated minds.

I do most heartily and sincerely congratulate you upon, and take a lively interest in your genius and achievements, notwithstanding I am aware of the fact that among many people I shall not receive that credit for sincere interest that I would if I were only a plain, independent and private citizen. For the misfortunes of our political customs and practices are such that whenever one is elevated to high office by the favor and confidence of his fellow men he is at once branded as a professional politician, and is thenceforth, by many people, deemed incapable of taking an active interest in popular affairs except as a means of accomplishing selfish political ends. But after a considerable time of real experience in public affairs, my once exceedingly sensitive mind is becoming insensible to these assaults, and by practice I have reinforced and hardened my cuticular covering until I begin to feel quite comfortable under the rain of the steel-pointed darts of calumny as they fall broken and harmless from my side. The number of people engaged in this business is so great and the industry so important, that it should not only always receive executive recognition and favor, but should be the object of special care and protection in our legislation, whenever such protection is needed. Some salutary laws have already been enacted for the protection of, and to enforce the principles of honesty in, this business, and other legal protection might be suggested which would be proper. I find upon reviewing the statute laws upon this subject that there is a strong intimation therein contained that there may possibly be found in your calling, as in all others, men who do not always do business with the rule of strict integrity as their guide.

I find it therein intimated that men have been known in the dairy business who will adulterate milk with water and other "*deleterious*" substances, and will even withhold "strippings" from milk which they sell for human food, or manufacture into full cream cheese. That it is even intimated as *possible* that some might be *mean* enough to sell milk from diseased or swill-fed cows, and palm off skimmed milk upon the hungry little cherub at the family table, who eagerly seizes his cup to quaff the delicious draught, but hastily sets it down again and gives vent to his indignant expression upon the outrage. It is also therein intimated that there are some so mean and regardless of common honor that they will commingle oleomargarine and animal fats with colored butter, and strange to say neglect to mark upon the package the component parts of the vile compound. In the statute concerning the adulterations of butter and prohibiting the same as a crime, there is a very amusing section, forcibly illustrating the generosity and tenderness of the average legislator and his susceptibility to be misled by the wily *fraud* who would adulterate butter; for after gravely providing in the act that any person who shall mix oleomargerine, suine, butterine, beef fat, lard, or any other foreign substance with any butter or cheese intended for human food, and offer it for sale without marking plainly upon the package its true contents and component parts, that he shall be deemed a criminal, and for the first offense may be fined $200, for the second $200 and be imprisoned in the county jail, and for the third and subsequent offenses be fined $2,000 and imprisoned in the penitentiary from one to five years. And then the gener-

ous and sympathetic legislator follows these wise and proper provisions with the saving clause, that "No person shall be convicted under any of the foregoing sections of the act if he shows to the satisfaction of the court or jury that *he did not know* that he was violating the provisions of the law, and could not by reasonable diligence have obtained the knowledge." How excruciatingly tender this saving clause is in its provisions. I can but vividly imagine the simplicity and guilelessness of a man who is so naturally depraved and innately *mean* that he would deliberately go to work and mix *lard*, or *beef fat*, with rich, pure butter, for the purpose of selling it for food and cheating his fellow men, and then coming into court and defending by showing that he actually did not know there was any law against it. He did it as a naturally dishonest act, and knew at the time that there was a *natural* law against it, which made it criminal, as much as to steal his neighbor's property.

Our laws for the prevention of contagious diseases among animals are fairly effective, and should be carefully enforced on every occasion. I hope that all laws intended to punish and prevent all forms of fraud in connection with this business will meet with the hearty approval and support of this representative body of men; that honor and confidence may be the sure fortress of the protection of this industry as well as it is of all others.

In preparing my address to-night I have ignored figures and statistics which at best are not very attractive to the popular audience, but which are instructive and interesting to the student of this calling. But you will get the facts and figures, which are sufficiently abundant to show in a startling manner the growth of this enterprise, from others who address you in this convention, and who have the time and skill to collate and present them in a striking way, and you will get them from your reports and publication.

I must confess, also, that I have felt much embarrassed in preparing and delivering this address, for keenly recognizing the eternal fitness of things as I do, I am painfully aware of the lack of that practical knowledge of the present dairy business which fits one to be an instructor or an entertainer. Present methods and forms in dairy farming are an interesting but practically unknown field to me. My personal experience with the cow is limited to two well marked, but widely distinct epochs in life. I do not know as it will aid you much in your search after knowledge to relate any of my experience, but it may entertain you, and such as it is you are welcome to it.

The first epoch was from twenty-five to thirty years ago, when a boy upon an Illinois farm, where the house was located in the fringe of the timber and the fields timidly ventured out upon the adjoining prairie. About my first regular boy's duty was to tend the cows and do the milking, aided by an older sister. The family regulations and part of its subsistence, under the able command of my mother, required this duty to be performed regularly, if not cheerfully and well as was often the case. To drive the five or six milch cows in from the stalk-field or the straw stacks in winter, or the woods pasture in summer to the cow lot near the barn, then let in the roaring, hungry calves for a very brief and limited feast, and when it was thought they were getting too much nearly pulling their ears off to make them let up; and then with milk pail and three-legged stool, tackling the sore and cracked lacteal organs of the old-fashioned, sensitive and somewhat resentful cow,

and tugging away until, after much tribulation on my part and that of the cow, the bucket was nearly full. But there was often a limit found to the patience and long-suffering of the cow as she went through her trying ordeal, and then, unable to stand her torture longer, I was frequently kicked over in hopeless confusion with the bucket of milk, as the cow, driven to desperation, displayed the utmost contempt for her present danger or of my future destiny. I wonder if you have not become so perfect in your methods that you do not have cold milking-lots and cross cows any more. But I have yet to refer, with vivid recollection, to the saddest and most trying part of the early epoch of my personal experience in the dairy business. Oh, it almost makes me shudder yet to think of the days when, with flagging energy and total lack of zeal, I have had to pound away on sour and thin cream in an old-fashioned dasher-churn for two hours at a time, before I could get release from labor by the appearance of the globules of butter, when all the time my presence was imperatively demanded in the ball game upon the green with the other boys. Oh the intensity of the painful but very salutary lessons that are still impressed upon my mind, as I vividly remember seeing my mother bring out the old churn, wash and scald it out, sure symptoms of trouble to come for me, and then how, sometimes, I took a panic and ran away, only to return late in the day to meet with a *hot* reception, and have to churn more stubborn cream next day to make up for it.

The latest epoch of my experience occurred since I have, by your grace and favor, been occupying the Governor's office. I have heard it strangely said that the cow is a great *civilizer*. I have no doubt of the fact now. I know it to be true by experience.

Upon moving to Springfield with my wife and three babies we lived, for the first three or four months, on the milkman's supplies; and public water, you know, is proverbially poor in Springfield. Such a life as we had. I thought that by close attention it would be possible for me to govern the state; but I completely despaired of restoring order in and governing my household. Discontent and lack of health reigned. Finally, after prolonged effort and at great expense, a fine large milch cow was procured. As if by magic, peace, health and contentment was restored, the children grew fat and rosy, the wife blooming and happy, while civilization in my family was perfected and household government became a pastime. This happy condition of affairs existed until a few days ago, when some scoundrel having not the fear of God or man before him, and having a total disregard of the contentment of my family and entire want of respect of the chief executive of a great state, came to my barn at night and stole my cow away. I am in distress, my family upon the verge of anarchy for want of the civilizing influences of the generous cow.

But having already talked long enough to weary your patience, and thanking you for your kind consideration and attention, I will close without even reciting the customary sonnet of gushing admiration for the historic milkmaid—but for whom I have great respect.

Song, "Finnigan's Wake," Mr. W. D. Hoard.

Ventriloquist's Song, "Old Kentucky Home," Mr. John Cheatham.

Music, by the Band.

Convention adjourned, to meet at 9 o'clock the next morning.

Met pursuant to adjournment at 9 o'clock a. m., December 14th.

Report of the committee appointed to take action on that part of the President's address relating to the new formation of the association under the laws of the State:

To the Illinois Dairymen's Association: Mr. President—Your committee to whom was referred so much of the President's annual address as relates to the new and formal organization of the society under the laws of the State, and with instructions to devise and recommend such measures as shall secure the election of new officers, and provide for their re-election at the regular annual meetings of the society, beg leave to report:

That the resignations of all present officers have been tendered and now await the action of this body, and your committee recommend their acceptance as a necessary preliminary to any further action in the premises.

Respectfully, J. G. LUMBARD.
H. B. GURLER.
J. H. BROOMELL.
Committee.

Motion to adopt seconded and carried.

Report of the committee on by-laws:

BY-LAWS OF THE ILLINOIS DAIRYMEN'S ASSOCIATION.

OFFICERS.

SECTION 1. The officers of this association shall consist of a President, Vice-President, Secretary, Treasurer, and Board of Directors composed of seven members, of whom the President and Vice-President of the association shall be members, and the President *ex-officio* chairman.

DUTIES OF PRESIDENT.

SEC. 2. The President shall preside at the meetings of the Association and of the Board of Directors. It shall be his duty together with the Secretary and Board of Directors to arrange a programme and order of business for each regular annual meeting of the Association. He shall have power to call special meetings of the Association and of the Board of Directors, and upon the written request of five of the members of the Association it shall be his duty to call such special meetings. It shall be his further duty to call on the State Auditor of Public Accounts for his warrant on the State Treasurer for the annual sum appropriated by the Legislature for the use of this Association, present the warrant to the Treasurer for payment, and on receiving the money receipt for the same, which he shall pay over to the Treasurer of this Association, taking his receipt therefor.

DUTIES OF THE VICE-PRESIDENT.

SEC. 3. In the absence of the President, his duties shall devolve upon the Vice-President.

DUTIES OF THE SECRETARY.

SEC. 4. The Secretary shall record the proceedings of the Association and of the Board of Directors. He shall keep a list of the members, collect all the moneys due the Association (other than Legislative appropriations),

and shall record the amount, with the name and post office address of the person so paying, in a book to be kept for that purpose. He shall pay over all such moneys to the Treasurer, taking his receipt therefor. It shall also be his duty to assist in making the programme for the annual meeting, and at the close of said meeting to compile and prepare for publication all papers, essays, discussions, and other matter worthy of publication, at the earliest day possible, and shall perform such other duties pertaining to his office as shall be necessary.

DUTIES OF THE TREASURER.

SEC. 5. The Treasurer shall, before entering on the duties of his office, give a good and sufficient bond to the Directors of the Association, with one or more sureties, to be approved by the Board of Directors, which bond shall be conditioned for a faithful performance of the duties of his office. He shall account to the Association for all moneys received by him by virtue of said office, and pay over the same as he shall be directed by the Board of Directors. No money shall be paid out by the Treasurer except upon an order from the Board, signed by the President, and countersigned by the Secretary. The books of account of the Treasurer shall at all times be open to the inspection of the members of the Board of Directors, and he shall, at the expiration of his term of office make a report to the Association of the condition of its finances, and deliver to his successor the books of account, together with all moneys and other property of the Association in his possession or custody.

DUTIES OF THE BOARD OF DIRECTORS.

SEC. 6. The Board of Directors shall have the general management and control of the property and affairs of the Association, subject to the By-Laws.

Four members of the Board shall constitute a quorum to do business.

The Board of Directors may adopt such rules and regulations as they shall deem advisable for their government, and may appoint such committees as they shall consider desirable.

They shall also make a bi-ennial report to the Governor of the State of the expenditure of the money appropriated to the Association by the Legislature.

It shall be their further duty to decide the location, fix the date and procure the place for holding the annual meetings of the Association, and arrange the programme and order of business for the same.

ELECTION OF OFFICERS.

SEC. 7. The election of officers shall be by ballot at the first annual meeting to be held in December, A. D. 1883, and annually thereafter. They shall hold their offices for one year and until their successors are elected and qualified. A plurality vote shall elect. Vacancies occurring may be filled by the Board of Directors until the next annual election.

MEMBERSHIP.

SEC. 8. Any person may become a member of this Association by paying to the Treasurer such membership fee as shall from time to time be prescribed by the Board of Directors.

QUORUM.

SEC. 9. Seven members of the Association shall constitute a quorum for the transaction of business, but a less number may adjourn.

ANNUAL ASSESSMENT.

SEC. 10. One month prior to the annual meeting in December of each year the Board of Directors shall fix the amount, if any, which may be necessary to be paid by each member of the Association as an annual due.

Notice of such action must be sent to each member within ten days thereafter, and no member in default in payment thereof shall be entitled to the privileges of the Association.

AMENDMENT OF BY-LAWS.

SEC. 11. These By-Laws may be amended at any annual meeting by a vote of not less than two thirds of the members present. Notice of the proposed amendment must be given in writing, and at a public meeting of the Association, at least one day before any action can be taken thereon.

J. G. LUMBARD,
J. H. BROOMELL,
S. S. PEMBLETON,
Committee.

On motion, the By-Laws were read *seriatim*, each section passed upon and the resolutions accepted as a whole.

Resignations of the President, Secretary, Treasurer and members of the Board of Directors, placed before the Association and accepted.

Report of the Committee on Nominations presented.

The Committee on Nominations presented the following for Directors: Joseph Tefft, J. H. Broomell, C. F. Mills, S. K. Bartholomew, H. B. Gurler, C. C. Buell, L. Johnson. The ballot being taken, they were elected.

The Directors then met and elected Dr. Joseph Tefft, President; J. H. Broomell, Vice President; R. P. McGlincy, Secretary, and J. H. White, Treasurer.

REPORT OF THE COMMITTEE ON DAIRY IMPLEMENTS.

DEKALB, Ill., Dec. 13, 1883.

To the Illinois State Dairymen's Association: Your Committee appointed to inspect dairy implements beg leave to report that while there is an unusually meager display, there are *several* exhibits of real merit.

Near the north end of the room stands the "Ross" feed cutter, exhibited by Mr. Caldwell, which deserves especial mention. Certainly a dairyman who is so fortunate as to own one of these machines need never be short of cut feed, for it is strong, regular of motion, and not likely to get out of repair.

Mr. Batcheler, of Rock Falls, exhibits a churn which needs no comment, for it is so generally used.

There are two samples of machine-made ash tubs, manufactured by Hook Bros., of Union City, Indiana, which speak for themselves, being well made, smooth and of good material. Our Elgin manufacturers must look well to their laurels for the Hoosiers are after them. The Chicago Creamery Co. exhibit creamery and cans well adapted to the purpose.

The apparatus for testing the quality of gathered cream shonld interest all cream gatherers. The inventors, Messrs. Schoch & Bolander, claim with their machine to be able to determine the exact butter value of each patron's cream. If this can be accomplished, and with some improvements which this enterprising firm will make, there seems to be no good reason why it cannot be. A long step will be taken toward reducing the gathered cream plan to a system.

F. B. Fargo & Co., of Lake Mills, Wisconsin, have the only display of butter and cheese color on exhibition. It is an oil color and is used by many of our very best butter makers.

Recognizing the close relation of the food of the dairy cow to the dairy interest, G. Vansickle has invented a horse fork which will greatly lessen the labor of the hay maker.

Your Committee, through the courtesy of Mr. Gurler, were permitted to visit his factory to witness the operation of the DeLaval cream separator, which is exciting so much interest among progressive dairymen, and which bids fair, if successful, and we see no reason why it should not be, to revolutionize the whole business of butter and cheese making.

Respectfully,

LOVEJOY JOHNSON,
T. H. BAKER,
M. W. COLTON,
Committee.

Motion to adopt seconded and carried.

ANNUAL REPORT OF THE SECRETARY.

Since our last annual meeting I have issued and mailed to the members of the Association copies of the annual report.

The report was not such as I would liked to have sent out, but as we were "scrimped" for funds I had to do the best I could, and so the report was very much abbreviated. But as our Association has been recognized by the State as an object worthy of aid, I hope that the forthcoming report will be a credit to the Association and the banner dairy State of the West.

As most of our members are aware, the legislature of last winter gave us an annual appropriation of $500 to aid in compiling, publishing and distributing our annual reports, and by reason of this appropriation the Association will be able to issue a report that will be of some value to the members.

At the time we were making efforts to secure the appropriation it was deemed advisable to organize under the State law and apply for a charter. This was done, and several meetings of the directors were held during the spring and early summer to perfect an organization, and while it was not wholly accomplished the preliminary steps to that end were taken.

During the year the secretary has been called upon to conduct a large amount of correspondence with various officials, both State and National, as well as individuals who were seeking information. These letters have always been cheerfully and promptly answered, and such information as was sought after conveyed, when it could be done. Year by year the work of the secretary increases, and in answering correspondents and preparing for the annual meeting no little time is required from that official.

During the past ten months I have expended for the Association the sum of $2.47, of which $1.00 was for recording the charter and list of officers as is by law required, and $1.47 for postage and incidentals. This sum is still due your secretary. Respectfully submitted,

R. P. McGLINCY, *Secretary.*

Motion to adopt seconded and carried.

REPORT OF COMMITTEE ON RESOLUTIONS.

Resolved, That this Association heartily endorses the action of the recent National Convention of Stockmen, held in Chicago, in urging prompt and effective legislation by Congress, providing means by which contagious diseases among domestic animals, especially *pleuro-pneumonia* in cattle, may be eradicated.

Resolved, That the State Superintendent of Public Instruction, and through him the county superintendents, be earnestly requested to urge upon the teachers of the state the importance of instructing their pupils in the elementary truths of agricultural science.

Resolved, That the thanks of this Association are hereby tendered to the Chicago & Northwestern R. R. Co. for favors received; to the representatives of the press for their reports and courtesies, and to the speakers from abroad and from among our members.

Resolved, That we are grateful to the citizens of DeKalb and vicinity, and their committees, for their successful efforts to make this Convention a success. Especially to Mr. Haish, the proprietor of this hall, may the barbs of his wire prick the conscience of the man who is ungrateful for the free use thereof.

WHEREAS, Musical exercises were intended to form a part of the programme of the Convention, and local arrangements had been made therefor,

Resolved, That we are thankful for the efforts made, and regret the cause which prevented the accomplishment of the hospitable intent.

Resolved, That we hereby express our thanks to Governor Cullom, our representatives, and the legislature of the State, for the appropriation of $500 annually to the use of this organization.

Resolved, That we thank Dr. Tefft for his able and efficient performance of the duties of president of this Association during his occupation of the office.

C. F. DEXTER,
O. S. COHOON,
Committee

Motion to adopt seconded and carried.

Invitations were tendered to the Association from the following persons to hold the next annual meeting:

J. H. White, invitation to hold the next annual meeting in Aurora; O. S. Cohoon, an invitation from Belvidere, as follows:

To the Honorable Board of Directors of the Illinois State Dairymen's Association:

GENTLEMEN: In behalf of the citizens of the city of Belvidere and the county of Boone, I invite and extend to you an invitation to hold the next meeting of the Illinois Dairymen's Association in the town of Belvidere.

You will please observe or remember that the town of Belvidere once had the honor of entertaining this Convention when in its infancy; and now, since it has become a full-grown, perfected Association, we would like to have the honor of holding the same in our city again.

Yours respectfully,

O. S. COHOON.

E. E. Chester, of Champaign, supplemented by Prof. Morrow, an invitation to Champaign, as follows:

CHAMPAIGN, ILL., Dec. 17, 1883.

Directors Illinois Dairymen's Association:

GENTLEMEN: Having had the honor to present a verbal request to your Association, I herewith submit an invitation in behalf of our citizens, to your honorable body, to hold your next annual meeting in the city of Champaign, Ill.

Believing that you are a band of earnest workers, laboring for the many rather than a selfish few; that your zeal in this very important vocation may incite our farmers to more careful ways of thinking and acting; that there may be a mutual benefit result from your visit to our little city, University and its art gallery, museum, library, buildings, grounds, farms, barns, and stock; that to acquaint yourselves with our score of teachers, and to have their assistance in that meeting, would at least be pleasant, and that our people would feel highly honored in entertaining you, I urge upon you, if consistent with the best interests of your society, that your next meeting may be held at Champaign, Ill.

Very respectfully yours,

E. E. CHESTER.

Convention adjourned to meet at 2 o'clock in the afterneon of the same day.

Convention met pursuant to adjournment at 2 o'clock p. m.

AIDS TO THE FARMER'S DAIRY.

BY PROF. S. A. KNAPP, IOWA AGRICULTURAL COLLEGE.

By the farmers' dairy I design to designate a dairy that is kept solely for the production of butter and cheese, or milk for the general market; as distinct from dairies where the primary object is the sale of pure bred stock and the production of milk is secondary and mainly to advertise the cow; and as distinct also from dairies where milk is retailed upon a fashionable local market, or fancy butter is sold to special customers at high prices.

Dairies under these special advantages can with safety pursue a policy that would bankrupt the average farmer. It is my purpose here to outline some practical considerations requisite to the success of the farmer's dairy.

The average dairy must, for many years at least, be composed of the common cows of the country, with more or less infusion of better blood. But because the farmer is compelled to use these common animals there is no excuse for the negligence in selection which almost everywhere prevails. The thoroughbred, which has become a model of beauty and utility, and is

making such marvelous records for beef, milk and butter, has been brought to its present state of perfection by the intelligence and patient industry of man; and woe be to the breeder of good stock who dims his eye or relaxes his nerve. The general farmer should take a lesson from that most worthy and honorable class of farmers, the breeders of improved stock, and apply their well established methods of improvement to common stock.

SELECTION: The common cow may have a pedigree; that is, there are valuable facts in her history that may be ascertained and should be known to the breeder or purchaser—the character of the dam and grand dam for quantity and quality of milk, vigor of constitution, docility, regularity of breeding, predominance of males or females in offspring, and all other important facts. It has been a significant fact in the Young Mary family of Shorthorns that the noted ancestor, imported Young Mary by Jupiter, had fourteen heifer calves to one bull, and such has been the tendency to the production of females in this family that more than four times as many recorded animals are claimed for it as belong to any other family. There are individuals among our common herds of excellent characteristics but of unknown blood, which are extremely valuable for the purpose of crossing with pure stock. How valuable we do not know, because no history has been kept by which it can be determined whether those characteristics are sporadic or are in a measure fixed and can be perpetuated.

As farmers we are confronted by this important fact, that unless measures be taken to ascertain and record the value of our common stock for specific purposes, it must go to the wall, because progressive agriculture demands definite forces.

What has been affirmed of the dam may be affirmed in regard to the sires, but here there need be little difficulty for thoroughbreds only should be used.

How shall we replenish the herd after the foundation has been properly laid? We can continue the plan of purchasing, but with the assurance that a dairy of high order can never be secured in this way. The farmer must raise his calves to meet with high success, because in addition to inherited qualities, conditions of food and management during growth have much to do in determining the value of the future cow. Take a single case: If little grass and hay, and considerable corn be fed during the first year, a limited capacity of stomach will very naturally be developed and a tendency to thrive only under grain conditions. Such an animal is a poor grazer and a light hay feeder.

Upon the other hand, if considerable wheat bran and oats be fed with abundance of milk, grass and hay, the tendency will be to produce a large stomach with a well sprung rib, fine head and short legs, while rapid growth will be secured. Such an animal will give a large flow of milk and keep in fair flesh upon pasture alone, and when dry will winter well upon hay. This is of great importance to the farmer, as a ton of corn is worth only about 25 per cent. more than a ton of the best meadow hay for food. The best hay at $4 per ton would be equal to corn at $5, or 14 cents per bushel. Hay contains an abundance of nutritive material to support an animal in high condition. The question is, whether the animal will eat and can digest a sufficient quantity. This depends upon the quality of the hay and the capacity

and power of the stomach. There are other points, but this serves to illustrate the importance of commencing with the calf to secure the valuable cow.

It is not my purpose to discuss science as applied to the production of butter, but to drop such practical hints as will aid the average farmer to condense cheap food through a low priced and economical machine into products valuable for the general market.

Protection from cold and storms. It is unnecessary to discuss the importance of barns and sheds, as no intelligent dairyman will do without them. Sufficient care, however, is not exercised to have the barns so comfortable and convenient that the cattle may be kept in during stormy days, and in the morning during extreme weather.

A matter to which still less consideration has been given is protection during the day.

Frequently the thoughtless herdsman turns the cattle out from a warm stable to shiver in an atmosphere below zero, with a cutting wind. Some experiments at the Iowa Agricultural College farm indicate that a day of such exposure will shrink the flow of milk ten per cent. and that this shrinkage is more or less permanent. The direct loss to the farmer in milk is not all. It increases the consumption of food, decreases the power of digestion, saps the vitality of the animal and induces disease. It is a common remark that lumber and shingles are cheaper than corn; it is still truer that good shelter belts are cheaper than hay at ten cents per ton.

A single row of willows does not constitute a good shelter belt: it should be well interspersed with evergreens to form a perfect wind break. At a low estimate such a protection will save two dollars per winter on each animal in food consumed to secure equal returns in butter or beef.

The general farmer must soon understand what the scientific dairyman has long since known, that for the products of the dairy to command the highest prices in the markets of the world, three things are necessary:

1st. Milk of the highest quality in purity, substance and flavor.

2d. That the processes by which solid substances in milk are manufactured into butter or cheese shall be of the most improved character, scrupulously exact and prudishly neat.

3rd. That it shall be transported like a Chinese emperor, without coming in contact with the world, and be placed upon the market as fresh, rosy and fragrant as when it left the skilled hands of the dairy maid.

To secure this high order of milk it will be necessary to have the best cow, the best food and the best care. Scrub cows, having failed in the milk business, should make an assignment and go west to grow up with the country or go east to contribute to the manufacturing of pressed meats and cheap sausage; scrub pastures must be drained and seeded to the improved grasses; scrub hay must be relegated to a past barbarism, and scrub management, like the leprosy of Naaman, must be cured by seven times dipping.

In the manufacture of butter I am confident the present factory system must in part be superceded by some better plan. No farmer can afford to sell his milk, nor can he afford to pay ten cents per pound on the butter for the collecting of the cream and the manufacturing and marketing. Besides in neither of these ways can the first quality of butter be made.

There is no business that can stand permanently such a tax as is required for cream gathering. It should be admitted, however, that this is a great improvement over the old prairie system.

It has long appeared to me tnat farmers must soon adopt the plan of concentrating interests or abandon co-operation. Four or five farmers upon adjoining farms could construct a simple dairy house and manufacture their butter upon the most improved methods, and fifty such farm factories could employ one man as an inspector and general agent for the sale of products. The inspection should cover not only quality of butter, but should include cows, food, management and everything that contributes to the best results.

Our factory friends say, "This will destroy the factory." It might dispose of a few, but in the main present factories would be used as centres for gathering and handling butter of the highest grade and upon which the largest margins can be made by the dealer.

In other words, cream gathering will then be changed into butter gathering. Such centres for the collection and distribution of the products of the dairy are of vital importance to the farmer. They supplement him in his busy life and connect him with the great markets of the world. Without such centres and a careful system of inspection it is doubtful whether the scattered dairies could be kept to any standard of excelllence.

In addition to this and in a work requiring so much art and science, some plan for dairy schools should be adopted, and I see no better way at present than a winter school of from two to four weeks. I trust that at an early day the agricultural colleges may be able to provide one such school of the dairy for the general farmer during the winter.

MR. HIBBARD: I have my doubts about Mr. Knapp's plan working. I saw substantially that same thing being practiced about two or three years ago in Iowa. I have seen what women called marble cake, in imitation of two kinds of marble, but I never saw anything that surpassed that butter for variety. I went there with my brother to buy out a creamery for the Boston market. The butter never went to Boston, I am happy to say. I do not say but that the plan is possible; there is no law against it, but I am more than doubtful if even three or four farmers would continue to do it year after year; I never had any experience in the creamery business, but I have had a great deal of experience with men; and while the thing may be possible, I don't believe it is practicable.

MR. POTTER: It would require just about as much apparatus to make butter for four or five farmers as for fifteen. It would be very expensive.

MR. BUELL: I have heard a plan referred to that was something like this, and which was spoken of as being successful. They did this way: They did their own churning and took the fresh butter to one party who worked it into shape and sold it. He claimed by that process a success. That, however, seems to me more feasible than this other plan.

DAIRY FARMING IN ILLINOIS.

BY COL. CHAS. F. MILLS, OF SPRINGFIELD, ILL.

Among the essential elements to success in dairy farming may be mentioned good dairy stock, soil and climate suitable for the production of the ration likely to ensure a large yield of milk of the quality best suited to the wants of the butter and cheese maker, and not the least, experienced and skillful farmers and manufacturers of dairy products.

The matter of obtaining cows that will return a good profit on the original investment and turn the food consumed to the best advantage, is one of the greatest importance, as with soil and other conditions favorable to success, disappointment and loss will result, unless the dairyman has cows of better quality than the average.

In the selection of dairy stock it has too frequently been the custom to purchase cows for temporary use and dispose of them to the feeder or butcher as soon as the flush or the best part of the milking period had passed. This plan may be advisable in a few exceptional cases, but as a rule should not be followed.

The difficulty of securing average good cows where this system is practiced increases each succeeding year, while the loss in the near future from the too common practice of consigning to the block good and bad milkers is irreparable. The number of successful dairymen who have demonstrated the advantages and profits resulting from the saving of the best cows and improving the quality of the produce by breeding to sires of demonstrated dairy value, is increasing each year. The dairymen of Illinois cannot do their sons and successors in business a better service than by retaining their best cows for perpetuating and improving upon the best standards of this dairy cow of the period.

As the cost of feeding pure bred stock is no greater than that for subsisting native or scrub stock, while the average value of the pedigreed stock is several times that of the common stock, it should not require any argument to convince our dairymen that they will materially advance their prosperity by investing their available means in well-bred, recorded dairy cows. The demand for recorded dairy cows of the several leading breeds is increasing more rapidly than the preparations made for the supply. The dairymen of Illinois will serve their interests and greatly add to the wealth of the state by substituting as fast as practicable pure bred animals for the native or scrub stock now in too general use.

The revenue to the foreign breeders of Holstein or Dutch Friesian cattle, the breeders of Ayrshire and Jersey cattle, compare favorably with the amount annually received for the dairy products sold from the famous dairy sections of Europe.

There are not enough herds of Holstein, Ayrshire or Jersey cattle in America to supply the necessities of the dairy farmers of this country for pedigreed bulls, and it will be many years before there will be raised a fraction of the number of recorded females of these breeds needed by our dairy-

men. The dairymen of this state cannot give this important matter too much or early consideration if they have an ambition to make Illinois the recognized headquarters for well bred dairy stock.

An authority, in speaking of our state, says: "Illinois has taken the front rank among butter producing states; and the butter now made in the creameries of Illinois stands higher in quality and sells for more in the great markets of this country than the butter made in any other state." If we expect to sustain the enviable reputation now enjoyed by our dairy products in the home and foreign markets, for the large quantity and superior quality of the butter and cheese made in this state, the best stock must be obtained, and there must be no lack of skill on the part of the manufacturer.

The determination of the dairymen of this state to largely supply the rapidly increasing demand for recorded dairy stock will result in the improvement of the productive capacity of our cows, as well as the quality of the product, and the gradual displacement of the inferior animals that disgrace so many farms, and make it impossible for the owners thereof to show a creditable or satisfactory bank account.

There is no reason why this state in the not distant future should not be the recognized headquarters for the best specimens of the various breeds of dairy cattle. The quality of the representatives of the beef breeds raised in Illinois is not surpassed by the cattle produced in any portion of the world, and why should not the dairymen of this state successfully compete with the breeders of Holland, the Island of Jersey, or the Ayrshire district of Scotland, in raising the most profitable breeds of cows for the production of cheese or butter.

Until the best quality of well bred dairy stock can be generally introduced, much can be done by the dairymen of Illinois to increase the average profits on each cow by the adoption of a standard as to the quality and minimum yield of milk that each cow must produce to retain her place in the dairy. The adoption of a system of testing each cow in the dairies of this state and the slaughter of such as were found unprofitable would make a radical change for the better and largely increase the revenues of our dairymen.

The number of dairymen who make careful tests of the comparative merits of their cows is increasing each year, and such parties are convinced that time cannot be spent to better advantage than that devoted to weeding out the inferior and unprofitable cows.

SOIL AND CLIMATE.

The soil and climate of Illinois, especially the northern half, compares most favorably with any other section for the production of grain and forage of the best quality for a large and rich yield of milk. The soil is fertile and generously responds to good cultivation and the application of manures.

The cultivated grasses that have demonstrated their superior value over the native or more common varieties, make a luxuriant growth wherever introduced into this State.

The temperature and rainfall in all portions of the State are quite uniform, with no extremes of heat or cold, and no lack of moisture to ensure profitable grain and forage crops.

The average monthly temperature and rainfall in the northern and central divisions of the State during the past five years are given in the following table:

NORTHERN DIVISION.

YEAR.	TEMPERATURE.			RAIN AND MELTED SNOW. Inches.
	Highest.	Lowest.	Mean.	
1882	75.45	24.23	49.47	3.42
1881	72.00	23.50	49.10	3.78
1880	74.00	23.00	48.00	3.34
1879	75.00	18.00	46.00	2.67
1878	73.00	28.00	49.00	2.61

CENTRAL DIVISION.

YEAR.	TEMPERATURE.			RAIN AND MELTED SNOW. Inches.
	Highest.	Lowest.	Mean.	
1882	77.60	29.10	52.92	4.42
1881	75.80	25.60	51.50	3.79
1880	78.00	27.00	52.00	2.81
1879	78.00	23.00	51.00	2.16
1878	77.00	30.00	52.00	3.05

There being no question as to the ability of our dairymen to obtain improved milch stock, that will insure handsome returns for the investment, and the admitted adaptability of our rich soil and favorable climate for dairy purposes, nothing further seems requisite to success except the proper management of the farm and the skilled manufacturer of butter and cheese.

It would require many volumes to give the best methods of farming and making superior quality of dairy products and only a brief outline can be given in a paper of this character.

The dairy farm should be thoroughly tile drained, the lands seeded with such a variety of grasses as will ensure a succession of fresh and nutritious pasturage during the growing season. The seeding of varieties of grasses best suited to the soils and wants of the dairy cow has not received sufficient attention, and comparatively few appreciate the advantages to be derived from a thorough and systematic cultivation of grass lands by seasonable top dressing, harrowing and rolling.

It is estimated that a proper seeding of our pastures with a variety of seeds best suited to the soils of this State would increase the yield of forage plants from 50 to 100 per cent. and that the quality of butter and cheese produced on such farms would be greatly improved.

QUALITY OF PRODUCT.

The profits of the dairy depend almost entirely upon the quality of the butter and cheese produced, and no argument is needed to convince this assemblage that a skillful butter and cheese maker is a necessity.

The dairyman with the best of cows and with pastures admirably adapted to the production of a maximum growth of the most nutritious grasses, frequently fails for want of an experienced and skillful butter or cheese maker.

The progressive dairyman will not be content until he obtains the highest price for his butter or cheese. If the cause of failure rests with his manufacturer, a change is made. If his pastures are at fault the necessary drainage, seeding and other improvements are made without unnecessary delay. If his cows, in quality and quantity of milk yield, are not up to the standard, the best representatives of the dairy breeds that his means will permit are purchased.

DAIRY STATISTICS.

A paper upon dairy farming in Illinois would not be complete without some figures concerning this important and rapidly growing industry.

The dairy interests of Illinois represent such an amount of capital, intelligence, and so large and influential a population, as to entitle this industry to much more consideration than it has heretofore received at the hands of our legislators and the general public.

According to the best authorities Illinois has—

412 creameries and cheese factories and fixtures, constructed at an average cost of $3,000, making a total value of.....	$1,536,000 00
1,000,000 cows, average cost, $35	35,000,000 00
Each cow requires from 4 to 5 acres of land to keep her the year, say 4½, requiring 4,500,000 acres, at an average value of $50 per acre.....	225,000,000 00
To work this amount of land, care for the milk, would require 4,163 teams of two horses each, with wagons and harness, estimated at $300 each team.....	1,248,900 00
To feed 8,326 horses will require say 2½ tons of hay each per year, at $6 per ton, and 1,515,332 bushels of oats or its equivalent.....	579,489 00
To 250,000 farm milk cans for transportation of milk, at a cost of $3.50 each	870,000 00
To 6,244 laborers or 3 to each 160 acres, at $432 per year, including board.....	2,697,408 00
Estimated amount invested by the dairymen of Illinois, for 1883.....	$266,931,797 00

In addition to the above it is safe to say that there are over three hundred thousand private creameries in the State, as in every farm house more or less butter is made.

There is no other article of food, excepting bread, that is so generally

found upon the tables of the rich and poor as butter, and the same should be said of cheese.

Dairy products are indispensable to our people and should be classed as necessary luxuries. When our people are informed as to the comparative value of cheese and meat, and appreciate the fact that one pound of average good cheese contains as much nutriment as two pounds of fresh beef, there should be such an increase in the demand for cheese in Illinois that the facilities for making it would have to be largely increased to supply the demand in this State. The taste of our people is influenced somewhat by the condition of their finances but more by fashion or custom, and frequently prejudice and habit has much to do with our preferences and appetites. All present can remember the effort made to acquire a taste for certain articles of food now highly relished, and such a wholesome, palatable and economical article of food as cheese should be no exception to this rule.

It is, however, the exception when a person is found that does not like cheese. The small quantity of cheese consumed per capita is evidence that the citizens of this State are not patronizing this home industry, much to the disadvantage of health and our pecuniary resources.

The home demand for cheese can be largely increased by a systematic effort on the part of the Illinois Dairymen's Association and friends of this industry.

It is suggested as a means of calling attention to this matter, that a number of short, crisp articles on this subject be prepared and sent to the papers of this State, say one each month, with a request from this Association that the item appear. A systematic effort in this direction in due time would have the effect to largely increase the demand for cheese, and add largely to the importance of this industry in Illinois. The supply of cheese can be increased to meet any paying demand, and the important question is, the creation of a larger and more profitable market for this product.

The majority of our people are not very much interested in statistics and soon tire in the work of examining long columns of figures, and for these reasons the statistical part of this paper has been retained for the finale.

The extent of the dairy interests of this State can be determined for the closing year by an examination of the following table, which gives the quantities of butter, cheese and milk reported in each county in the State, as shown in the last census. The estimated values are approximately correct.

The increased interest in this industry, from year to year, will enable all interested to estimate the larger product for the present year.

The returns show that Illinois had 865,913 cows, and was exceeded in number only by New York.

The number of pounds of butter made in this State in 1880 was 53,657,943, which amount was exceeded that year only by the States of New York, Pennsylvania and Ohio.

The number of pounds of cheese made in Illinois in 1880 was 1,035,069. This amount was less than that reported for California, Iowa, Maine, New York, Ohio, Vermont and Wisconsin.

The number of gallons milk reported sold, or sent to butter and cheese factories, was 45,419,719—an amount exceeded only by New York.

The estimated value of these products for this State in 1880 is as follows:

Milk	45,419,710	gallons	$ 4,538,971
Butter	53,657,947	pounds	11,412,118
Cheese	1,035,069	"	121,408
Total			$16,072,497

The ten leading counties in the production and value of butter, cheese and milk, as shown in the following tables, are as follows, and are credited with the quantities noted:

MILK.

Kane county	10,881,300	gallons.	Value	$1,088,130
McHenry county	7,046,338	"	"	704,634
Cook county	5,153,975	"	"	515,397
DuPage county	4,711,786	"	"	471,179
DeKalb county	2,327,167	"	"	232,717
Will county	2,116,036	"	"	211,604
Boone county	1,505,540	"	"	150,554
Lake county	1,433,450	"	"	143,345
Ogle county	1,233,834	"	"	123,383
Winnebago county	1,217,023	"	"	121,702
Total	37,626,440	"	"	$3,762,645
Total for State	45,419,710	"	"	$4,538,971

It will be seen that the ten counties named are credited with over three-fourths of the milk marketed in 1880.

BUTTER.

DeKalb county	1,712,589	pounds.	Value	$445,233
McHenry county	1,387,797	"	"	444,095
Will county	1,571,251	"	"	408,525
Kane county	1,106,097	"	"	331,829
Winnebago county	1,377,372	"	"	330,569
Whiteside county	1,497,036	"	"	329,348
Ogle county	1,427,547	"	"	328,336
Cook county	1,142,341	"	"	319,855
Stephenson county	1,385,648	"	"	319,699
La Salle county	1,431,413	"	"	286,183
Total	14,039,091	"	"	$ 3,543,772
Total for State	53,657,947	"	"	$11,412,118

Nearly one-third of the butter made in the State in 1880 should be credited to the ten counties named above.

CHEESE.

McHenry county.....	176,966 pounds.	Value.....	$ 15,927
Peoria county.....	65,016 "	"	8,452
Lake county.....	68,573 "	"	8,229
DeKalb county.....	61,574 "	"	6,773
Henry county.....	45,129 "	"	6,769
Carroll county.....	40,390 "	"	5,655
Jo Daviess county....	40,627 "	"	5,281
Madison county.....	32,070 "	"	4,490
Knox county.....	28,543 "	"	3,710
Hancock county.....	26,398 "	"	3,431
Total.....	585,281 "	"	$ 68,717
Total for State....	1,035,072 "	"	$121,408

Over one-half of the cheese produced in the State in 1880 should be credited to the ten counties named above.

AGGREGATE VALUE OF DAIRY PRODUCTS.

The ten leading dairy counties in the State, as determined by the total value of milk, butter and cheese produced in 1880, are named below:

Kane county.....	$ 1,420,968
McHenry county.....	1,164,656
Cook county.....	835,729
DeKalb county.....	684,723
DuPage county.....	628,089
Will county.....	621,136
Winnebago county.....	455,377
Ogle county.....	452,637
Lake county.....	420,243
Whiteside county.....	375,258
Total.....	$ 7,058,816
Total for State.....	$16,072,497

It will be seen that nearly half the dairy products of the State in 1880 were reported from the ten counties named above.

DAIRY STATISTICS BY COUNTIES.

The following table, giving the amount and value of butter, cheese and milk reported in each couniy in the State in 1880, is given herewith for the information and convenience of all who may wish to refer, in future, to the last census returns. The values are estimated and approximate correctness.

The census returns have been used in this paper, as they are more complete than other dairy statistics:

DAIRY PRODUCTS, 1880.

COUNTIES.	MILK.			BUTTER.			CHEESE.			TOTAL VALUE.
	GALLONS.	Price per Gal.	VALUE.	POUNDS.	Price per Lb.	VALUE.	POUNDS.	Price per Lb.	VALUE.	
Adams	132,287	10	$13,228	610,137	18	$109,825	6,885	12	$826	$123,879
Alexander	4,515	10	451	42,801	22	9,416	104	12	12	9,879
Bond	100,475	10	10 047	233,657	17	39,722	4,464	15	670	50,439
Boone	1,505 540	10	150,554	642,448	28	179,885	5,430	09	489	330,928
Brown	4,020	10	402	213,662	15	32,049	883	..	1,384	33,835
Bureau	87,152	10	8,715	957,688	19	181,961	9,227	15	....	190,676
Calhoun	25	10	2	58 126	27	15,694	720	..	....	15 696
Carroll	373,209	10	37,320	685,103	26	178,127	40,390	14	5,655	221,102
Cass	18,400	10	1,840	178,844	18	32,192	230	..	....	34,032
Champaign	26,444	10	2,644	801,752	19	152,323	19,454	13	2,529	157,496
Christian	7,334	10	733	527,808	20	105,562	2,885	15	433	106,728
Clark	280	10	28	375,988	16	60 158	120	17	20	60,206
Clay	325	10	32	238,102	15	35,715	2,683	15	402	36,149
Clinton	69,036	10	6,902	243,912	23	56,100	10,528	15	1,579	64,582
Coles	12,616	10	1,262	402,186	18	72,393	2,760	12	331	73,986
Cook	5,153,975	10	515,397	1,142 341	28	319,855	5,303	09	477	835,729
Crawford	185	10	18	287,600	16	46,016	624	14	87	46,121
Cumberland	120	10	12	221,838	15	33,276	100	18	18	33,306
DeKalb	2,327,167	10	232,717	1,712,589	26	445,233	61,574	11	6,773	684,723
DeWitt	17,447	10	1,745	370,083	16	59,213	1,338	12	160	61,118
Douglas	6,090	10	609	281,167	17	47,798	987	14	138	48,545
DuPage	4,711,786	10	471,179	538,519	29	156,170	7,396	10	740	628,089
Edgar	12,919	10	1,292	440,863	18	79,355	2,710	30	542	81,189
Edwards	105	10	10	110,645	18	19,916	390	12	47	19.973
Effingham	131,439	10	13,144	274,010	16	43,842	3,765	16	602	57,588
Fayette	25,838	10	2,584	345,029	6	55,205	1,501	13	185	57,974
Ford	25,016	10	2,502	350,970	20	70.194	3,664	13	476	73.172
Franklin	25	10	2	251,573	7	42 763	12	..	....	42,765
Fulton	48,675	10	4,867	900 574	20	180,115	4,260	15	639	185,621
Gallatin	1,500	10	150	97,816	23	22,498	1,245	20	249	22,897
Greene	6,016	10	602	324,549	20	64 910	3,066	20	613	66,125
Grundy	41,028	10	4,103	532,172	22	117,078	13,170	12	1,580	122,761
Hamilton	.....	10	.....	194 124	16	31,060	64	..	....	31,060
Hancock	1,798	10	180	759,741	18	136,753	26,393	13	3,431	140,364
Hardin	.....	10	.....	43,754	22	9,626	.....	..	....	9 626
Henderson	510	10	51	241,270	18	43,429	2.509	16	400	43,880
Henry	107,434	10	10,743	1,142,266	21	239,876	45.129	15	6,769	257,388
Iroquois	368,078	10	36,808	887,119	20	177,424	9,305	10	930	215,162
Jackson	5,105	10	510	230,597	21	48,425	215	..	....	48,935
Jasper	1,925	10	192	246,638	14	34,529	1,510	15	226	34,947
Jefferson	215	10	21	308,108	20	61,622	490	12	59	61,702
Jersey	20,623	10	2,062	226,796	23	52.163	778	13	101	54,326
JoDaviess	35,127	10	3,513	860,399	21	180,684	40,627	13	5,281	189,478
Johnson	255	10	25	228,529	15	34,279	18	..	....	34,304
Kane	10,881,300	10	1,088,130	1,106,097	30	331.829	10,095	10	1,009	1,420,968
Kankakee	620.928	10	62,093	857,126	23	197,139	13,050	12	1,566	260.798
Kendall	693,327	10	69.333	805,820	21	169,222	1,300	12	153	238,708
Knox	370,721	10	37,072	740 487	18	133 280	28,543	13	3,710	174,062
Lake	1,433,450	10	143,345	1,074,676	25	268,669	68,573	12	8,229	420,243
LaSalle	604,213	10	60,421	1,431,413	20	286,283	2,920	13	380	347,084
Lawrence	216	10	22	221,140	18	39,805	2,333	..	....	39,827
Lee	437,335	10	43,733	1,390,855	20	278,171	3,829	13	498	322,402
Livingston	18,617	10	1,862	1,092,904	19	207.652	11,531	3	1,499	211,013
Logan	29,109	10	2,911	453,292	19	86,125	5,100	16	816	89,852
Macon	26,626	10	2,663	518,549	22	114,081	390	20	78	116,822
Macoupin	396,355	10	39,635	621,543	19	118,093	6,517	17	1,107	158,835
Madison	304,157	10	30,416	595,384	22	130,984	32,070	14	4,490	165,890
Marion	142,702	10	14,270	298,914	17	50,815	21,595	15	3,239	68,324
Marshall	9,160	10	916	315,188	20	63,038	655	14	92	64,046
Mason	220	10	22	215,683	20	43.137	.....	12	....	43,159
Massac	.....	10	.....	114,365	23	26.304	.....	12	....	26.304
McDonough	33,193	10	332	625,961	18	112,673	9.067	14	1.269	114,274
McHenry	7,046,338	10	704,634	1,387,797	32	444,095	176,966	09	15,927	1,164,656
McLean	113,477	10	11,348	1,021,239	19	194,035	6,453	15	968	206,351
Menard	8,701	10	870	200,202	18	36,036	869	11	95	37,001

DAIRY PRODUCTS, 1880.—*Continued.*

COUNTIES.	MILK.			BUTTER.			CHEESE.			TOTAL VALUE.
	GALLONS.	Price per Gal.	VALUE.	POUNDS.	Price per Lb.	VALUE.	POUNDS.	Price per Lb.	VALUE.	
Mercer	54,114	10	$5,411	512,193	16	$81,951	1,126	13	$146	$87,508
Monroe	22	10	2	109,612	19	20,466	695	..	....	20.468
Montgomery	204,241	10	20,424	524,156	19	99,590	2,655	15	398	120,412
Morgan	1,981	10	198	469,851	20	93,970	1,130	12	136	94,304
Moultrie	1,214	10	121	249,498	21	52,394	4,370	25	1,092	53,607
Ogle	1,233,834	10	123,383	1,427,547	23	328,336	7,060	13	918	452,637
Peoria	336.822	10	33,682	676,006	18	119,681	65,016	13	8,452	161,815
Perry	3,601	10	360	225,734	23	51,919	1,689	11	186	52,465
Piatt	6,626	10	662	250,355	20	50,071	1,260	12	151	50,884
Pike	45,490	10	4,549	512,145	15	76,822	720	15	108	81,479
Pope	515	10	41	228 889	22	50,355	377	..	....	50,396
Pulaski	504	10	50	58,665	23	13.493	590	15	88	13,631
Putnam	35	10	3	146,997	21	30,869	540	12	65	30,937
Randolph	5,311	10	531	313,337	20	62,667	6,188	16	990	64,188
Richland	15,431	10	1,543	227,850	13	29,620	13,004	11	1,430	32,593
Rock Island	160,120	10	16,012	604,999	21	133,090	2,840	14	398	149,500
Saline	4,091	10	409	147,597	12	17,712	24	..	....	18,121
Sangamon	377,445	10	37,744	705,173	22	155,136	1,765	10	176	193,058
Schuyler	9,374	10	937	291,684	22	64,170	635	15	95	65,202
Scott	1,240	10	124	153,986	19	29,257	673	13	87	29,468
Shelby	693	10	69	617.195	18	111,095	1,987	20	397	111,561
Stark	48,965	10	4,896	305,919	22	67,302	6,335	14	887	73 085
St. Clair	35,832	10	3,583	457,747	24	113,859	50,566	..	....	117.442
Stephenson	389,345	10	38 934	1,385.648	23	318,699	17,850	13	2,320	359,953
Tazewell	78,186	10	7,819	574,829	25	138,707	7,251	11	798	147,324
Union	9,000	10	900	184,305	17	31,332	.....	..	...	32,232
Vermillion	44,577	10	4,458	715,150	20	143,030	20,574	15	3,086	150,574
Wabash	2,554	10	255	77 356	16	12.377	150	10	15	12,647
Warren	13,755	10	1,375	446,621	17	75,925	1,475	12	177	77,477
Washington	1,520	10	152	255,195	15	38,279	390	15	58	38,489
Wayne	100	10	10	293.040	16	52,886	1,330	20	266	53,162
White	435	10	43	324,231	21	68,088	49	.	....	68,131
Whiteside	429,066	10	42,907	1,497.036	22	329,348	25,026	12	3,003	375,258
Will	2,116,036	10	211,604	1,571,251	26	408,525	8,390	12	1,007	621,136
Williamson	.....	10	.....	245,298	20	51,060	510	..	....	51,060
Winnebago	1,217,023	10	121,702	1,377,372	24	330,569	25,885	12	3,106	455,377
Woodford	8,508	10	851	630,952	18	113,571	8,198	17	1,394	115,816
Total	45,419,710	..	$4,538,971	53.657,947	..	$11,412,118	1,035,072	..	$121,408	$16,072,497

MR. BROOMELL: Mr. Mills refers to the idea that efforts should be made to increase the consumption of cheese in the state of Illinois. A commercial man would laugh at his suggestion. You will observe that when a commercial man wants to get goods introduced to the public, it is by first making such goods as the public wants, and then he will put them in the hands of the retailer, and then call the attention of the consumer to the place where the goods can be obtained. Now if, according to the Mills suggestion, you send out bulletins from time to time of the great importance of eating more good cheese in the state of Illinois, a man's wife raises the question, "Where can I get some good cheese?" Echo answers "Where?" and there it stops. This business lies with the manufacturers in the first place, making good cheese. The reason we don't have any cheese consumption in the state of Illinois is because they cannot get good cheese. I don't eat the cheese I make myself if I want good cheese, I go to La Fox and get it. If the manufacturers of the state of Illinois that are making cheese will make such cheese as people want, they are ready to take four times, yes sixty-five times the

cheese they are now consuming, at prices that will pay the manufacturer and pay the farmer.

MR. BEEKS: There are some things that the people of this world have to learn to eat; among those are oysters and tomatoes and a good many other things, but I venture the assertion that there is not a child born in this country that would not eat cheese in the first years of its life; you don't have to teach anybody to eat it, but there is not a house wife in the state of Illinois that can tell you where to go to get good cheese. My wife, every week of her life, asks where she can get it. I know of no place except where it is made.

SECRETARY MCGLINCY: I desire to call the attention of the Association to an article entitled "Facts," which may be of interest to some of the farmers or the creamery men here. It is in relation to some figures from Iowa, as follows:

The "shortage" question, as it is agitated among the gathered cream creameries, is certainly bringing out much valuable knowledge. What we do *not* know about cows, cream and butter, would make a book; what we *do* know is only a primer. The test plan of paying for the cream according to its butter value is disclosing a very wide range of difference in the value of cream.

The Charitan, Iowa, Creamery, gives the following table, showing the range of value in 36 different lots of cream the last half of October.

The first column of figures is the number of the patron; the second column the number of inches of cream gauge measure; the third column the number of pounds of butter made; fourth column number of ounces of butter to the gauge inch:

NO. PATRON.	NO. INCHES CREAM.	NO. POUNDS OF BUTTER.	NO. OUNCES TO THE GAUGE.
1	4⅜	4 lbs, 7 ozs	15
2	1⅝	1 15	18
3	4¼	3 7	13
4	3⅝	4 2	24
5	9⅜	12 3	20
6	6½	6 8	16
7	6	7 2	19
8	6⅝	9 4	22
9	3½	3 8	16
10	2⅝	3 4	19
11	1½	1 11	18
12	5⅝	7 3	20
13	16	17	17
14	5	5 15	19
15	4¼	3 1	11½
16	4	2 4	9
17	8	10	20
18	3	2 4	12
19	5⅝	2 15	9
20	6¼	3 15	10
21	6⅝	8 9	18
22	3	2 7	13
23	11⅜	10 4	14
24	2⅝	2 1	12
25	26	27 10	17
26	9½	5 3	9

27	4¾	4	2	14
28	2	1		8
29	4	3		12
30	4	4		16
31	9	9		16
32	8	8		16
33	3¾	3	1	13
34	5	4	11	15
35	3	2	13	13
36	3½	2	7	11
Total,	205¾	209 lbs. 4 oz.		

Here 205¾ inches of cream, gauge measure, made 209½ pounds of butter, and at the same time the number of ounces of butter to the inch varied from 8 ounces up to 24. Only five among the number made exactly 16 ounces to the inch.

MR. GURLER: We are running our work now on that plan. We find that the butter figured from the tests compares very closely with the actual tests. For instance, our cream gatherer goes over the route to-day, and he will bring in a careful test from each patron. Whenever those tests are churned we figure out the amount of butter that should be made and compare with the amount actually made, we will have a variance of from two to five pounds, sometimes one side and sometimes the other. That only proves that the work is done accurately, that the cream gatherer takes his test carefully. Recently our test averages from 72 to 162, when it would be supposed to be 100. We let the patrons do their own skimming and we take it up. The great point is to have your test can hold just the right amount, and another great point is to have the cream thoroughly measured before the test is taken.

We require our gatherer to change the can three times before testing so as to be uniform. I am satisfied this is the true way to run the business. There is a great difference in the value of cream. If one lot is raised in ice water and the other at 60 degrees, you will get 25 per cent. more from that raised in the ice water. And if we take it all alike it is like the old way of paying the same for all kinds of butter. There is a gentleman here, Mr. Schoch, who has been running on this plan long enough to be able to give us some valuable information. Will you tell us, Mr. Schoch, by what per cent. will the expense of book-keeping be increased by this process, and the keeping of accounts in carrying it out?

MR. SCHOCH: I should say perhaps 20 per cent., as near as I can say.

MR. BUELL: And how much is the work increased?

MR. SCHOCH: I think I am perfectly safe in saying on the aggregate not over 5 per cent. Of course, at first the expense would be much greater, but when you have got things in running order, your patrons all tested and they understanding the business, and that they are required to be uniform in regard to skimming, one time like another, then it will not be found necessary to test the patrons, on an average, more than once in two weeks. We have been running two years, and do not test our patrons more than once a month.

MR. WHITE: Do you follow your rule to pay every patron just what their cream churns even when there is a wide difference?

MR. SCHOCH: Yes, sir.

MR. WHITE: If you find one patron whose cream makes one and one half pounds of butter to the guage, and another one that makes one pound, do you pay the same?

ANSWER: We do. Our test varies from one half pound to one and one half pounds to the inch.

MR. WHITE: Do you take any pains to ascertain whether these large variances are caused by the fact of some patrons taking more milk off with their cream, or from the fact of raising their cream more thoroughly.

ANSWER: No; it is immaterial to us.

MR. WHITE: Are your patrons all satisfied that you are paying, for instance, 25 cents to one, 12½ to another, and 37 cents to another? Are they all satisfied?

ANSWER: We don't pay by the guage, we pay by the pound. They all understand they are paid so much per pound for butter; if the cream raises 75 per cent. they are credited only for 75-100ths of a pound of butter to the inch. It is true, some of them when they get down to 55 and 60 per cent. they begin to think they are entirely too low, and we tell them "Test the matter for yourself," and they find it so.

QUESTION: Do they admit as a rule that their test compares with yours?

ANSWER: Yes.

MR. COHOON: If I have a can of milk and Brother Brown has another one, and they are skimmed just exactly alike, will 100 inches of each churned just exactly the same, average just the same amount of butter?

ANSWER: No, sir; it will not.

QUESTION: How do you account for that?

ANSWER: First, is the cows; next, is the kind of feed. Another great difference is in the manner in which that cream is raised; whether in cold water or allowed to raise gradually. I believe the cream that is raised the quickest will be that raised in cold water, and there will be the greatest amount of cream.

MR. GURLER: The water is a better conductor than the atmosphere, and I think that is the reason the water cools the cream the quickest; tell us, Mr. Schoch, do you require your patrons to let the milk stand a uniform time?

MR. SCHOCH: No, sir; we only require a uniform time for skimming. We require them to set their milk in water in warm weather; we don't require it in cool weather.

QUESTION: Do you weigh the butter you test right from the churn?

ANSWER: Yes; wash it from the churn.

QUESTION: Your aggregate yield of butter, do you weigh after salting?

ANSWER: Yes.

QUESTION: Do you work but once?

ANSWER: Twice; we work the same day; in the forenoon and at three o'clock; we let it stand from five to six hours.

MISCELLANEOUS.

MR. GURLER: Mr. President, here is a farmer that has requested me to explain why cream raises faster in water than it does in atmosphere of the same temperature? It is simply for the reason that the water is a better conductor than the atmosphere, cools the milk faster, and raises the cream faster, but it will take more cubic inches of cream to make the same amount of butter than if it is raised in the air.

MR. SCHOCH: That is also my experience. The question has been asked me at what time the cream will be raised? I think, if the temperature is right, it will all raise in four hours, and we do not care, under our system, if it stands six, twelve or twenty-four hours; it will only settle down and be denser, that is all.

MR. BUELL: I do not think that all the globules are raised above the line of demarkation, even if the measurement at that moment may be the greatest. I am inclined to believe that some of the smaller globules perhaps have not got up yet.

THE PRESIDENT: The cream never gets all up in the milk; when set in the water or set on the floor, a portion of the globules do not rise. The line of demarkation will be made and for nearly two inches below you will find them. We made an experiment some years ago in which a cow was driven up and milked and the milk run through a ⅝-inch lead pipe which was coiled in a box of water. The milk was drawn slowly through this pipe and when it came out it was apparently as cold as the water. It was drawn into glass cans, and in one and one-half hours by the watch the line of demarkation was plainly visible. So I think that in a can set in water, if you stir your milk, it will cool equally and the cream will rise to the surface. These small globules never will rise; you put the milk under the microscope and you will find them for two inches below the line of demarkation. Of course, in running through this pipe the cream did not separate in the process, but the milk was thoroughly cooled and the cream raised within the time I said. I would not advocate the plan of stirring the milk to raise the cream, but I would stir it until I cooled it down somewhat, then let it stand and the cream will rise.

MR. BUELL: There is more to this; there is another cause in the specific gravity of the butter globules as compared with the water particles, supposing them to be of the same temperature. Then as the process of cooling goes on the water particles cool the quickest, and the difference in the specific gravity is increased still more.

THE PRESIDENT: The cream oil holds the heat much longer than water or milk. These smaller globules that I speak of as being below the line, I have never churned to see how they come out, but I know they are there. I have made many tests with the microscope, and I never found any milk they were not in, therefore in skimming you don't get all the butter globules until you skim a couple of inches below the line of demarkation between the cream and the milk.

MR. HIBBARD: I want to ask one question. A Mr. Jenkins has advanced the idea that butter that is to be kept any length of time should not

be washed. Now, I have been brought up to think differently, and it struck me that it is contrary to our American practice.

THE PRESIDENT: I don't believe that the caseine can all be got out of the butter without washing it, and the smallest particle of caseine left in the butter will change that butter very much quicker than all the water you can put into it. The particles of caseine will start up decomposition and will spoil the whole mass in a very short time. I have no doubt but that it is a good idea to use a little salt in the water to wash the butter. White specks will often come from leaving in little bits of caseine, or from coarse salt.

MR. GURLER: I think the white specks come sometimes from the milk in the cream having soured and changed to curd. In the churning, by stopping the butter in the granular form, and not letting it go to the bottom of the churn, the curd is heavier and will go to the bottom of the churn, and you can draw it out mostly by turning on a stream of water; this curd will settle at the bottom and you will draw it out of the water.

Report of the Committee on Membership received and adopted.

Convention adjourned *sine die*.

RESPONSES TO TOASTS.

On the evening of Friday, December 14, 1883, the hall was filled to its fullest capacity by citizens and delegates. Mayor Brown presided, and introduced the speakers.

Toast—"The Elgin Board of Trade and Skim Cheese."

Response by R. P. McGlincy, secretary:

Mr. Chairman, Ladies and Gentlemen: A complex text and such a long one evidently does not mean much of a sermon from me. The Elgin Board of Trade, a commercial institution, was organized in Elgin in 1872, and grew out of a want felt by many manufacturers of cheese, of a proper and profitable mode of disposing of their goods. The first year $81,000 worth of butter and cheese were sold; the second the sales were somewhat larger, and it has continued to grow until the sales have reached a figure that is hardly comprehended even by those who have watched the transactions all these years. The following, however, will suffice to show what is being done on that famous board:

Since the organization of the Board of Trade in 1872, the total sales have been $14,110,021.95. Had these products all been sold on commission, the commissions alone would have amounted to $605,501.09, a magnificent sum which has been saved to the factorymen at an annual cost of $2 each. During the year 1883 the sales on the board have been 351,181 boxes of cheese, aggregating 13,174,092 pounds; 7,274,074 pounds of butter, the money value of which is $3,282,527.19. This was the heaviest year's business ever done on the board, and the combined weight of the butter and cheese sold during the year is 20,448,166 pounds, or more than 1,000 car-loads of goods. This business represents at least 2,000 car-loads of freight, for there must be sent to the factories, boxes for the cheese, tubs for the butter, coal, and other articles used in the manufacture of the butter and cheese. Indeed, to wonderful proportions has grown the world-renowned Elgin Board of Trade; and

every dairyman should rejoice at its usefulness and give it his hearty support.

This board has done much to enhance the value of dairy products in Northern Illinois. Buyers are often present from Boston, New York, St. Louis, Chicago and Cincinnati, and occasionally they come from Liverpool, England. We have been able to maintain the reputation we gained years ago as butter makers, and consequently people who want gilt-edge, first-class fine goods, come to Elgin.

About the skim milk cheese business, that is something I don't want to talk about, as I abhor it, and I think it is a mistake to make it.

Toast—"The Hennepin Canal as a Means of Transportation."

Response, J. G. Lumbard: I have been asked to say something about the Hennepin Canal. I know very little as to this project. I know it is proposed to start a canal in the vicinity of Sterling, and run it down to the Mississippi, and I believe the idea is to build a highway for vessels from the Mississippi to the lakes, or from the Gulf to the Atlantic by an interior route, and I beg to say here and now that any enterprise inaugurated and carried forward for the benefit of the community at large, which shall be a convenience and an aid to the people of the country, is also an advantage to the interests I represent. The prosperity of this country does not depend upon any one railroad or any one canal. The east and the west of America are very far apart, but dependent one upon another. The prosperity of one is the prosperity of the other; they mutually thrive, and they suffer together. One argument that has been used in favor of the Hennepin Canal is the use it would be in case of war; but I do not apprehend in my lifetime, nor perhaps in anybody's lifetime, a war with Canada. The civilized nations of the earth have learned that arbitration is the sensible way to settle national troubles, and that a few thousand dead soldiers does not change the status of any case or decide any question.

Toast—"The Milk of Human Kindness."

Response, Rev. F. W. Foster, DeKalb.

Mr. Chairman: I feel very much pleased, feeling that I had given to me a creamy subject—the milk of human kindness. During this convention we have been treated to a good deal of that milk, and in choosing me to speak at this time, I feel as though one had been called upon not even to deal out a pint measure of skim milk. I don't know where the idea of the milk of human kindness originated. I suppose that sometime there were a great many calves in the human race. There are people in whom the milk of human kindness seems to sour. Nothing pleases them. Mr. President, I don't want to sour anybody to-night, so I will thank you for this honor, and leave you.

Toast—"The Father of Barb Wire."

Response, J. F. Glidden.

Ladies and Gentlemen: If I were a volunteer here to-night, perhaps an apology would be necessary for my appearance here; any apology due you must come from your secretary. This question of the barbed wire fence is a very important one. If I should undertake to say that the fences in this country cost more than all the other improvements, you would think I was

extravagant; and yet it is so. As to the manufacture of the barbed wire fence, I will read you a few statistics which perhaps will be interesting.

NATIONAL FENCE.

A necessity for the economy in fencing which this system has introduced is thus strikingly shown in figures:

To protect $2,450,000,000 worth of growing crops from being destroyed by $1,659,211,933 worth of live stock, the farmers of the United States have built 1,619,195,428 rods of fence, inclosing 250,505,614 acres of ground, with an average of 6.46 rods per acre costing $1.08 per rod, or $6.98 per acre, making a total cost of $1,748,529,185, or about $89,317,192 above the value of the live stock. Adding the total annual expense for maintaining our fences, we find that for every dollar's worth of live stock that we have, we have expended $1.06 in fencing, to protect $1.47½ worth of crops.

You will see from this that the invention of the barbed wire fence has reduced the expense of fences at least one-half, and at that rate saves enough to pay the national debt in two years. This fence is used everywhere, and there is always found my picture—everybody knows me all over the country from my picture. This invention was first brought out by me in putting up a bit of fence for my own use. I secured a patent immediately, and after awhile I sold the patents for $60,000, and ten cents one hundred pounds royalty, and they paid me in 1882, $153,000 royalty.

Toast—"Our Export Trade."

Response by C. C. Buell.

Mr. Chairman, Ladies and Gentlemen: This subject is no joke, and I am no joker. The subject suggests some analogies, to which I will call your attention. When one country needs the products of another country, when those products are sent from one country to another, in a certain sense, a vacuum is produced, which is filled only by the return of the products of another country to this country. And it is impossible for such an interchange of products to take place without something analogous to what I have suggested, occurring. A debt is created or a credit exists on one side, which may be called a vacuum, and it is filled by what another country has to produce, which is said to pay this debt. It is often gold and silver which is sent back, and gold and silver are the products of the country. This interchange, this transfer of products is made under an economic law of commerce, and any obstacle thrown in the way of this free interchange is an obstacle thrown in the way of the fullest extension of the wealth of the country and of the world, necessary to promote the happiness and well-being of the people. There is another law figure which suggests to us an analogy.

Action and re-action are equal, and in opposite directions. If this country has a superabundance of any product which some other country wants, we send it over and receive back something which we want.

The effect of all extravagance in the matter of tariff is the prevention of this interchange between countries, prevents the carrying out of these economic laws.

One of the excuses made for the raising of these barriers is the apology that it was done to protect infants—infant industry. But in this respect did you ever know of an industry getting so old that it did not still claim to

be an infant in production; it grows to be a bigger infant, and requires more care all the time. It is like some of our calves that grow and grow until they get bigger than the mother cow, and can lift her off her feet in drawing the sustenance. Pretty quick we put it onto two cows, and its necessities become more and more increasing, until it can lift two cows, and that is how these infant industries hold on and grow.

After a while, however, the idea was conceived that these infants must have nurses, and who are the nurses? Why, simply an excuse for continuing this state of things, so they make the workingmen of this country the nurses of this infant. As an apology for continuing this state of things they put this calf out of sight, and direct attention entirely to the nurses. I think we ought to be getting past these things. I think the workmen of this country should be working for themselves, and not for this old infant.

This is too large a subject to enter into at this time; furthermore, from the nature of the subject it is necessary to stop somewhere, and it shall be right here.

Toast—"Lawyers as Milking Machines."

Response, I. V. Randall.

Toast—"From Physic to Farming."

Response, Dr. Joseph Tefft.

Ladies and Gentlemen: I can hardly see what this toast means, unless it is insinuated that I have stopped the practice of medicine and gone to farming. One thing is certain, so long as I have quit that practice I certainly cannot kill anybody with my farm. I have my farm, and my milk is all taken to the condensing factory in Elgin. I practiced medicine in this country for over forty years before I left it, and quit when my health failed, and since then have looked after my farm.

Toast—"A Green Mountain Peak, Peeking out West."

Response, L. B. Hibbard.

I have been in this town about fifty hours, according to my calculation, and have already been badly treated. I have been twitted in public right here about the size of my nose. I am like the man who said, "I can stand it to have people tell lies about me, but when they come to tell the truth, it is more than I can bear." I have been called upon to say something about Vermont. Vermont was an old settled State when this country was a wilderness, out here in the beautiful, pellucid Chicago river poor the low Indian was dipping his oar, and where the south side is now, the Indian boys were playing. Vermont has about 335,000 inhabitants, about the same as DeKalb, but there are about 200,000 of the sons and daughters of Vermont scattered over the west. They have got some queer notions down there. There are a great many farmers down there that don't believe you can make butter by level farming. That your cow can't give milk unless she stands on a farm that stands up at an angle of forty-five degrees.

Toast—"The Dairy Maid."

Response, O. S. Cohoon.

The Dairy Maid. Formerly the dairy maid was a young miss of sweet sixteen or more, or a young wife, or a matron, who went to milk old Brindle, Daisy and Gyp, with—with a will and a purpose; with a milk pail on her head and two pails of nicely fixed up feed in either hand, singing a dairy

song to the tune—Co' Boss, Co' Boss, Co', or a little love ditty about meeting me at the garden gate. Now, the dairy maid is Mike, Yacob, Johannas, or Peter Peterson. Formerly, the milk maid went down in the meadow by the little brook, or around the corner of the haystack or barn to milk old Brindle. Now, he drives her into a big red barn full of fine clover and timothy, bran, oat meal, corn meal, oats, ensilage, cornstalks, and straw to bed her down, standing in her long row of stanchions, the queen and the boss of the situation.

Anciently and formerly the dairy maid learned the calves to drink. Now John does it. Formerly she either got or helped get the breakfast. Now her ma does it. Formerly, in my little primer, the dairy maid was pictured with rosy cheeks, sleeves rolled, showing—well, muscle, with smiles only a little less than the smiles of the mermaids, looking up the lane to see if John could see her milking old Brindle. Now, she sits in the parlor and lets John milk. Formerly after milking, she strained the milk, skimmed the milk, churned the cream, worked the butter and took it to market, and traded it for family groceries, calico, etc. Now, Professor More-to-morrow-and-hang-on-to-all skims the milk, puts in the buttermilk and makes the cheese. And Professor May-clinch-to-some-of-it sells it on some board of trade down east. Formerly the dairy maid made butter from old Brindle's cream. Now *he* makes it from her cream and her "O. C." and so on. And now, I like the former dairy maid the best.

Toast—"Our Tenth Annual Meeting."

Response, James Beeks.

You are aware of the fact that the members of the Illinois Dairymen's Association met in tenth annual session here—in DeKalb—"but," it is hardly necessary to be prodded with a "barb" to make us ask "wire" we here? How "Dairyman" pro-"pound" such a question on this occasion? Not a "Gurler" a boy would think of it, as some heavy "weight" or a strong "butter" would at once tell him to "cheese" it. If any one attempts it on this occasion, we "Mayor" may not do him up "Brown."

The sessions of this Association have been attended by the "cream de la cream" of this beautiful city, who will, no doubt, be glad when we shall have gone our "whey." Perhaps this has not oc-"curd" to you before, and may make you turn "pail" when I "udder" it; "but," we must not be "muly"-ish on the proposition, as we cannot always hang to the "teat" of hospitality. If we should, our pride might become somewhat "cow"-ed. On the principle that a new "Broomell" always sweep clean, we should retire while we are welcome. We have been here long enough to exhibit our "Dexter"-ity and should be willing to go "awhey" in order that we may again be welcome on the "Morrow," and should never "strain" our host at any time, or "skim" the "milk" of human kindness too close.

"Gathered cream" is always sweet on such occasions, and we should "Hoard" up the "whole milk" and treasure it as long as we "can"—milk can. "Dairy Maid" deny our right to do this?

I came here to stick my "Beeks" into this "butter" and "cheese" business, and have had many good "Times" making notes of "udder"-ances of the members, and "skimming" the "cream" as they draw the "milk" from the "teat" of the best "cows" of the association, and have been more than

delighted with the "gilt edge" of every proposition presented. The "golden" thoughts that have dropped have not "Lumbard" your minds; "but," have given you "food" for reflection which will be borne away as a beautiful "Rosette" and carefully treasured, and profited by in the future. You will carry with you many happy remembrances of this meeting, prominent among which will be the hospitable treatment which has been accorded by the ladies and gentlemen of this beautiful little city, and will not soon forget the important lessons which have been taught by those who have addressed you, and by the interchange of thought upon the questions that lie closest to your hearts, while we cannot do less than wish this good people the eminent prosperity which they so richly deserve.

Toast—"Our Times."

Response, H. T. Clendening.

Let me say in reference to this association, I don't know that I can express what I wish to better than in the language of a distinguished citizen, in these words: "Ladies and gentlemen, I expected to be pleased before I came, and I have been better pleased than I expected to be." I say heartily in behalf of the citizens of this village that we have been much pleased and instructed by your exercises, and we trust, gentlemen, that your experience has been so pleasant in our midst that we may prophesy your return to our town at no distant day.

Toast—"Our Hosts."

Response, C. F. Dexter.

As the hour is late and the audience is probably wearied, I will be very brief and say that our hosts have proven themselves hosts indeed on this occasion. Good night.

Thus closed the Tenth Annual Convention of the Association, which will pass into history as being the most successful meeting it has ever held.

ELEVENTH ANNUAL MEETING.

At a meeting of the Directors of the Illinois State Dairymen's Association held at Elgin, on Monday, January 14th, 1884, the invitations from Belvidere and Champaign were laid before the Directors, who after fully discussing the matter, by a unanimous vote, decided to hold the next (Eleventh) Annual Meeting of the Association at Champaign, on Wednesday, Thursday and Friday, December 17th, 18th and 19th, 1884. Proper announcement of programme will be made in due season. It is to be hoped that there may be a large attendance from the northern portion of the State, especially as Champaign is the seat of the Illinois Industrial University and Agricultural College, with the usefulness and management of which the farmers of the Northern counties have little knowledge.

The inside title page contains an error regarding the date of the next meeting. Let all remember that it occurs December 17th, 18th and 19th, 1884.

R. P. McGLINCY,
Secretary.

ELGIN, Ill., Jan., 1884.