

THIRD ANNUAL REPORT  
OF THE  
**International Association of  
Dairy and Milk Inspectors**

INCLUDING PAPERS READ AT THE ANNUAL  
CONVENTION IN CHICAGO  
OCTOBER 23-24, 1914

*“Take up the White Man's burden—  
The savage wars of peace—  
Fill full the mouth of Famine  
And bid the sickness cease.”*

COMPILED BY  
**IVAN C. WELD, Secretary-Treasurer**  
1116 CONNECTICUT AVENUE  
WASHINGTON, D. C.

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*Price One Dollar*



# International Association of Dairy and Milk Inspectors.

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## CONSTITUTION AND BY-LAWS

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### CONSTITUTION.

ADOPTED OCTOBER 16, 1911.

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#### NAME.

This Association shall be known as the International Association of Dairy and Milk Inspectors.

#### OBJECT.

The object of this Association shall be to develop uniform and efficient inspection of dairy farms, milk establishments, milk and milk products, and to place the inspection of the same in the hands of men who have a thorough knowledge of dairy work.

#### MEMBERSHIP.

The membership of this Association shall be composed of men who now are or who have been actively engaged in dairy or milk inspection. Any person who now is or who has been so engaged may make application to the Secretary-Treasurer, and if application is accepted by the Membership Committee, said applicant may become a member of the Association upon payment of the annual dues of five dollars (\$5.00).

**OFFICERS.**

The officers of this Association shall be a President, three Vice-Presidents, a Secretary-Treasurer, and two Auditors, who shall be elected by a majority ballot at the Annual Meeting of the Association, and shall hold office for one year or until their successors are elected. An Executive Board, who shall direct the affairs of the Association when not in Annual Session, shall consist of the President, the three Vice-Presidents, and the Secretary-Treasurer.

**AMENDMENTS.**

This Constitution may be amended at any Annual Meeting by a two-thirds vote of the entire membership of the Association. Any member proposing amendments must submit the same in writing to the Secretary-Treasurer at least sixty days before the date of the Annual Meeting, and the Secretary-Treasurer shall at once notify all members of such proposed amendments. All members voting on such proposed amendments shall register their vote with the Secretary-Treasurer on blanks provided by the Association before the date of the Annual Meeting.

# BY-LAWS.

ADOPTED OCTOBER 25, 1913.

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## ORGANIZATION.

The Constitution shall be the basis of government of this Association.

## ARTICLE 1.

### MEMBERSHIP.

SECTION 1. Any person eligible for membership under the Constitution who shall file an official application, accompanied by the first annual membership dues of five dollars, and whose application for membership shall have the approval of the Membership Committee, may become a member of the Association for one year.

SECTION 2. Any person having once become a member may continue membership in the Association so long as the annual membership dues are paid. Any member who shall fail to pay annual dues within 30 days after having been notified by the Secretary that said dues are due and payable, shall be dropped from membership. Any member so dropped may, within 90 days, be reinstated by the Membership Committee, upon application filed in due form and accompanied by the annual membership dues for that year.

SECTION 3. A member of the Association may be expelled for due cause upon recommendation of the Membership Committee and a majority vote of the members at any annual meeting. Any member so expelled shall have refunded such *pro rata* part of his membership dues as may not be covered by his term of membership.

**ARTICLE 2.****OFFICERS.**

**SECTION 1.** The officers of this Association shall be a President, a First, Second and Third Vice-President, a Secretary-Treasurer, and two Auditors, who shall be chosen by ballot at the annual meeting of the Association, and shall hold office for one year, or until their successors are duly elected.

**SECTION 2.** The Executive Board shall consist of the President, the three Vice-Presidents, and the Secretary-Treasurer.

**SECTION 3.** The Membership Committee shall consist of the President, the three Vice-Presidents, and the Secretary-Treasurer.

**ARTICLE 3.****DUTIES OF OFFICERS.**

**SECTION 1.** It shall be the duty of the President to preside at all meetings of the Association. He shall examine and approve all bills previous to their payment, appoint all committees unless otherwise directed by vote of the Association, and perform such other duties as usually devolve upon a presiding officer, or are required of him by the Association.

**SECTION 2.** The Vice-Presidents, in the order of their selection, shall perform the duties of the President in his absence.

**SECTION 3.** The Secretary-Treasurer shall record the proceedings of the Association. He shall keep a list of members, and collect all moneys due the Association, giving his receipt therefor. He shall record the amount of each payment, with the name and address of the person so paying. He shall faithfully care for all moneys entrusted to his keeping, paying out the same only with the approval of the President, and taking a receipt therefor. He shall, immediately after his election to office, file with the President of the Association a bond in the sum of five hundred dollars, the expense of which shall be borne by the Association. He shall, at the annual meeting,

make a detailed statement of the financial condition of the Association.

It shall also be the duty of the Secretary-Treasurer to assist in making arrangements and preparing a program for the annual meeting, and to compile and prepare for publication all papers, addresses, discussions and other matter worthy of publication, as soon as possible after the annual meeting.

SECTION 4. The full management of the affairs of the Association when the Association is not in session shall be in the hands of the Executive Board, as provided in the Constitution.

SECTION 5. It shall be the duty of the Auditors to examine and audit the accounts of the Secretary-Treasurer, and all other financial accounts of the Association, and to make a full report of the condition of the same at the annual meeting.

#### ARTICLE 4.

##### MEETINGS.

SECTION 1. The annual meeting of the Association shall be held at such time and place during the month of October of each year or at such other time as shall be designated by the Executive Board.

SECTION 2. Special meetings of the Association may be called by the Executive Board, of which due notice shall be given to the members by the Secretary.

SECTION 3. Quorum.—Twenty-five per cent of the membership shall constitute a quorum for transaction of business at any annual meeting. Voting by proxy shall not be permitted.

#### ARTICLE 5.

These By-Laws may be altered or amended at any annual meeting of the Association. Any member proposing amendments must seasonably submit the same in writing to the Secretary-Treasurer, who shall then give notice of the proposed amendments by mail to each member of the Association at least thirty days previous to the date of the annual meeting.





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No inspector's knowledge and experience is complete until supplemented by the knowledge and experience of his fellows.

No inspector's knowledge and experience is complete until that knowledge and experience is subjected to discussion and criticism by his fellows.

Similarity of results desired calls for similarity of means employed.

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These three purposes can best be accomplished through the medium of the International Association of Dairy and Milk Inspectors. Read the Constitution on another page of this report, and if eligible for membership, write the Secretary's office at once for an application blank.

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# International Association of Dairy and Milk Inspectors.

## OFFICERS, 1914-1915.

*President*, A. N. HENDERSON.....Seattle  
*Vice-President*, C. F. BOSSIE.....Omaha  
*Vice-President*, DR. WM. H. PRICE.....Detroit  
*Vice-President*, DR. O. P. THOMPSON.....Waterloo  
*Secretary-Treasurer*, IVAN C. WELD.....Washington  
*Auditors*—  
    R. I. GORDON.....Tampa  
    DR. WM. S. GIMPER.....Harrisburg

## COMMITTEES.

### BOVINE DISEASES—THEIR RELATION TO THE MILK SUPPLY AND TO THE PUBLIC HEALTH.

Dr. Hulbert Young, Baltimore, *Chairman*.  
Dr. H. E. States, Detroit; Dr. F. J. Kennedy, Dubuque.

### HUMAN DISEASES—THEIR RELATION TO THE MILK SUPPLY AND TO THE PUBLIC HEALTH.

Dr. Wm. H. Price, Detroit, *Chairman*.  
Dr. C. O. Guimont, Quebec; Dr. Stanton H. Barrett, Chattanooga.

### CHEMICAL EXAMINATION OF MILK AND MILK PRODUCTS.

Dr. James O. Jordan, Boston, *Chairman*.  
Thos. A. Buckland, St. Louis; Prof. Horatio N. Parker, Boston.

## DAIRY FARM INSPECTION.

Prof. C. B. Lane, Philadelphia, *Chairman*.  
 Prof. H. A. Harding, Urbana; J. A. Gamble, Washington.

## CITY MILK PLANT INSPECTION.

E. C. Krehl, Detroit, *Chairman*.  
 E. Reuter, Chicago; F. H. Bothell, Salt Lake City.

METHODS OF APPOINTMENT AND COMPENSATION OF DAIRY AND  
MILK INSPECTORS.

Dr. O. P. Thompson, Waterloo, *Chairman*.  
 C. F. Bossie, Omaha; C. J. Steffen, Milwaukee.

LEGISLATION AND LEGAL LIMITS FOR THE CONTROL OF MILK  
AND CREAM.

E. F. Burke, Albany, *Chairman*.  
 L. P. Brown, Nashville; Benj. L. Purcell, Richmond.

## MEMBERS.

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Albert, Lorenz.....	Milk Inspector .....	Milwaukee, Wis.
Barrett, Stanton H....	Bacteriologist .....	Chattanooga, Tenn.
Berg, Gustaf L.....	Inspector of Milk.....	Worcester, Mass.
Bossie, Claude F.....	Dairy Inspector .....	Omaha, Neb.
Brown, Lucius P.....	State Food and Drug Com....	Nashville, Tenn.
Buckland, Thos. A....	City Chemist .....	St. Louis, Mo.
Burke, E. F.....	Chief, Bureau Dairy Products, State Dept. of Agriculture..	Albany, N. Y.
Calkins, Fred P.....	Milk Inspector, Tacoma, Wash.	Ellensburg, Wash.
Carroll, A. N.....	Milk Inspector .....	Pueblo, Colo.
Carroll, Thos. B.....	Milk Inspector .....	Wilmington, N. C.
Egan, Harold E.....	Chief Food Inspector.....	Dayton, O.
Foster, F. O.....	Supt. Towar's Wayne Co. Creamery .....	Detroit, Mich.
Gamble, J. A.....	Dairy Division, U. S. Dept. of Agriculture .....	Washington, D. C.
Gary, W. E.....	Milk Inspector .....	Louisville, Ky.
Gillie, Geo. W.....	Chief Milk and Meat In- spector .....	Ft. Wayne, Ind.
Gimper, Wm. S.....	Director of Milk Hygiene....	Harrisburg, Pa.
Gordon, R. I.....	Chief Pure Food Dept.....	Tampa, Fla.
Graves, H. T.....	Asst. Com. Agriculture, Div. Dairy Inspection .....	Olympia, Wash.
Guimont, C. O.....	Director Muncipal Laboratory.	Quebec, Canada.
Haggerty, A. L.....	Chief Food Inspector.....	Augusta, Ga.
Harding, H. A.....	Head Dairy Dept., University of Illinois .....	Urbana, Ill.
Henderson, A. N.....	Chief Milk Inspector.....	Seattle, Wash.
Heurich, V. N.....	Milk Inspector .....	Milwaukee, Wis.
Hood, A. J. G.....	In charge Food Inspection....	Montreal, Canada.
Hughes, T. B.....	Inspector in Dept. of Food and Drugs, Tennessee .....	Afton, Tenn.
Jordan, James O.....	Inspector of Milk.....	Boston, Mass.
Keeley, Peter T.....	Milk and Food Inspector.....	Waterbury, Conn.
Keihl, Harry .....	Dairy and Milk Inspector....	Milwaukee, Wis.
Kennedy, F. J.....	Meat and Milk Inspector....	Dubuque, Iowa.
Krehl, Edward C.....	Milk Inspector .....	Detroit, Mich.
Lane, C. B.....	In charge Scientific Dept., Supplee Alderney Dairy....	Philadelphia, Pa.
Lombard, Alfred W..	Dairy Bureau Agent.....	Boston, Mass.
Lyle, John H.....	Milk and Bread Inspector....	Minneapolis, Minn.
Mesloh, Harry S.....	Office State Dairy and Food Division .....	Columbus, O.
Mickle, J. D.....	State Dairy and Food Com....	Portland, Ore.
Norris, A. C.....	Chemist and Food Inspector..	Rockford, Ill.
Palmer, Wm. P.....	Chief Food and Dairy In- spector . . . . .	Baltimore, Md.
Pape, E. C.....	Milk and Food Inspector.....	Sioux City, Iowa.
Parker, Horatio N.....	.....	Boston, Mass.
Potter, Geo. C.....	Milk Inspector, Detroit.....	Saginaw, Mich.
Price, Wm. H.....	Health Officer .....	Detroit, Mich.
Purcell, Benj. L.....	Dairy and Food Com. of Va..	Richmond, Va.

Reuter, E.....	Supervising Milk and Dairy Inspector . . . . .	Chicago, Ill.
Rive, Henry.....	Dairy Instructor . . . . .	Victoria, B. C.
Rowe, Peyton.....	Deputy Commissioner Agriculture . . . . .	Richmond, Va.
Sasseen, J. H.....	With Pa Pro Company.....	Lowville, N. Y.
Seaman, Carl O.....	Milk Inspector . . . . .	Manchester, N. H.
Sharwell, Samuel G...	Chief Dairy and Food Inspector . . . . .	Newark, N. J.
Simpson, C. W.....	Dairy and Milk Inspector.....	Vancouver, B. C.
Smisek, M. J.....	Dairy Inspector for State of Minn. . . . .	St. Paul, Minn.
Smith, Russell S.....	Dairy Division, U. S. Dept. of Agriculture . . . . .	Washington, D. C.
Stahel, P. J.....	Chief Dairy Inspector.....	Toogoolawah, Queensland, Australia.
States, H. E.....	Milk Inspector . . . . .	Detroit, Mich.
Steffen, C. J.....	Chief Dairy Inspector.....	Milwaukee, Wis.
Thompson, O. P.....	State Dairy Inspector.....	Waterloo, Iowa.
Weld, Ivan C.....	Investigator for Chestnut Farms Dairy . . . . .	Washington, D. C.
Widmayer, Fred J....	Food and Milk Inspector.....	Scranton, Pa.
Young, Hulbert.....	Manager, Walker-Gordon Company . . . . .	Baltimore, Md.



# THIRD ANNUAL CONVENTION.

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CHICAGO, OCTOBER 23, 1914.

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The Third Annual Convention of the International Association of Dairy and Milk Inspectors was called to order at 10.30 o'clock with President C. J. Steffen in the chair, and with fifty members and others present.

Prof. H. E. Van Norman, Dean of the College of Agriculture of California, and President of the National Dairy Show, welcomed the Association, and spoke of the general advancement of the dairy industry and the growth and development of the Inspectors' Association. President Steffen responded to President Van Norman's welcome, and delivered the President's annual address.

Dr. O. P. Thompson, State Dairy Inspector of Iowa, Chairman, read the report of the committee investigating civil service conditions, following which the Association took a recess until 2 P. M.

The first speaker of the afternoon session was Dr. H. E. Barnard, State Food Commissioner of Indiana, who read a paper on "The Responsibilities of States and Municipalities in Protecting the Public from Milk-Borne Diseases."

Dr. Wm. H. Price, Health Officer of Detroit, Chairman, reported for the Committee on Dairy Farm Inspection.

Prof. C. B. Lane, of Philadelphia, reported for the Dairy Farm Score Card Committee.

Dr. H. A. Harding, of the University of Illinois, spoke briefly on the work and expectations of the sub-committee of the Committee on Dairy Farm Score Card of the Dairy Inspectors' Association. The convention adjourned at 5.15.

At the evening session, Dr. Wm. H. Price, Health Officer of Detroit, presented a paper giving the results of some original work done by his department in Detroit in connection with the compiling of statistics relating to infant mortality.

Mr. A. N. Henderson, Chief Dairy Inspector of Seattle, Chairman, reported for the Committee on Legislation and Legal Limits, and Prof. Frandsen, of the University of Nebraska, presented a paper on "Dairy Investigation and Dairy Instruction."

The business session of the Association was called to order at 10 o'clock on Saturday morning, October 24. Brief verbal reports of the officers were submitted. The Secretary-Treasurer reported the total amount of money received during the year, including the balance of \$1.02 carried over from last year, amounted to \$439.02. The total amount of money expended during the year was \$380.09, leaving a balance in the treasury of \$58.93. Mr. C. F. Bossie reported for the Auditing Committee that the books and accounts of the Secretary-Treasurer had been examined and found correct.

Ivan C. Weld reported for the committee which was appointed to consider the matter of providing a clause permitting honorary membership in the Association. The committee offered the following proposed amendment:

"Members of the Association may elect as honorary members, at any stated meeting, on the recommendation of the Membership Committee, those whose labors have substantially added to the scientific knowledge of milk supply betterment, or those who have been of pronounced practical influence in the improvement of the milk industry. From such members no dues shall be required. They shall have the privilege of attending the meetings of the Association, but they shall not be entitled to vote."

In accordance with the provisions of the By-Laws, the proposed amendment was laid upon the table for consideration at the next annual meeting.

The Association then proceeded to the election of officers for the ensuing year, with the following result:

President, A. N. Henderson, Seattle.

1st Vice-President, Claude F. Bossie, Omaha.

2d Vice-President, Dr. Wm. H. Price, Detroit.

3d Vice-President, Dr. O. P. Thompson, Waterloo.

Secretary-Treasurer, Ivan C. Weld, Washington.

Auditors—

R. I. Gordon, Tampa.

Dr. Wm. S. Gimper, Harrisburg.

Invitations were received from the Mayor and Chamber of Commerce of Buffalo, N. Y., and the Retail Merchants' Association of New York for the next meeting of the Association. Mr. D. O. Lively, representative of the Panama-Pacific Exposition, who was present, was given the privilege of the floor and extended a most cordial invitation for the Association to hold its 1915 meeting at the Panama-Pacific Exposition. Mr. Wm. E. Skinner, General Manager of the Dairy Show Association, who was present, was given the privilege of the floor and presented a most cordial invitation to the Association to hold its 1915 meeting at the National Dairy Show in Chicago. It was voted that the Secretary-Treasurer obtain, by letter, within two months' time, the opinion of the members of this Association regarding their choice of a meeting place for the next annual convention.



## GREETING AND ADDRESS.

PROF. H. E. VAN NORMAN, DEAN OF COLLEGE OF AGRICULTURE, UNIVERSITY OF CALIFORNIA, AND PRESIDENT NATIONAL DAIRY SHOW ASSOCIATION.

It gives me a peculiar pleasure to extend to you a welcome to this, the Ninth National Dairy Show. It has been the privilege of the men who have directed the activities of the National Dairy Show to be instrumental in organizing a number of associations relating to the dairy industry, and we have seen them grow and become important factors in this great dairy field. But of all the associations that have sprung into being as an indirect result of the Dairy Show, this one, perhaps, had less help to get started than any of them. You just came together by the force of necessity. I presume the craving in the hearts of those who were active in the work for companionship and inspiration and help of fellow sufferers and laborers brought your first groups together, and this association has grown rapidly, because it is meeting a real need in the work which you are carrying on.

I have been in a position, as you can readily understand, to watch a good many of the activities of the dairy industry. It is a big field, and the thought that was uppermost when I first got acquainted with it was the fact that the buttermaker was sure that he was the whole show, and that the dairy show could not exist unless he came. Then you turned your back on the buttermaker, and met the cattle man, and he was sure he was the whole show, and if the cattle were not here, the show would fail. Before you had finished shaking hands with the cattle man you met the man selling supplies and paying for floor space, and he had a similar idea, that there could be no dairy show if he did not come and take the space which had been provided.

There was that selfish viewpoint, and we went to work with the thought of creating the feeling that this was an immense

industry in the United States, made up of many branches, no one of which was the whole thing, and yet every one of which was necessary to its development, and the thing we needed, above all else, was more and better cows and more and better dairy products. That has been the central thought, and I believe, if I am not wrong in my judgments, that the last two or three years have seen a wonderful development and growth and application of that spirit, and your association has come into being at a time when that is the dominant spirit of this industry.

The Dairy Show has been a rallying point for the many parts of the industry, and has brought together the producer, distributor and consumer of dairy products, and your work, which started out in some cases as a wielder of the "big stick," has gradually evolved to a place where the big stick is the thing of last resort, and the better education of all concerned has become a prominent feature. You are here to-day from the North and the South and the East and the West, and you are here to rub off the corners. To me it is a very interesting fact that the railroad companies did not put air-brakes on all their trains, freight and passenger, until the law compelled them to. I might give many more illustrations of the fact that most of us do not do the best way we know of our own initiative. We need public sentiment, or something outside of ourselves, to force us to do as well as we can do. If that were not so, we would not have to have certified milk. Certified milk was not proposed by the dairyman. It was the outgrowth of a demand for better milk that persuaded the dairyman to produce a better milk than he was producing, and the inspection of our dairy farms is the outgrowth of that same sentiment. When it first started, some inspectors went out with the idea that the man who was producing the milk was a scoundrel and a scalawag, and would not produce clean milk if he could, and that therefore they had to use a club on him; but to-day, as a result of this kind of meeting—the get-together spirit—the inspector is learning that a hundred dairymen are no greater bunch of scal-

awags than a hundred inspectors. Each is learning that the other is human, and the average farmer is just as anxious to do the right thing as the average inspector is. On the other hand, the farmer is just as quick to resent it when a man tells him in a high-handed way how to run his farm as you would be to resent it if a man came into your office and told you how to run your business.

To-day the inspector is tolerant of the other fellow. The result is we are making more progress toward the ultimate goal of a better milk supply.

Second to that is the fact that we are learning that there are many different ways of accomplishing the same result, and that in different places different men have to use different methods for the same result, and the fact that this association has grown and prospered on the exchange of ideas is the best evidence that you are here for a purpose, and that you are attaining that purpose.

Somebody regretted that the rank and file of the farmers cannot get here to the Dairy Show. I regret it, but I have never lost any sleep over it. We cannot carry any such show as this for the rank and file, but we can bring together the leaders of all the great communities of the United States, and if, for example, some man who has a radical idea of improving the milk or controlling bacterial life, gets up and delivers it in this meeting, he is likely to go home with other ideas to add to his.

The judges standing around our amphitheater judging cattle get ideas. One man is an enthusiast on the head being the best index of the cow's dairy ability. Another fellow says if he can just see the udder he does not care about the rest of it. A man standing around and arguing this for a day or two goes home a little more tolerant of the other fellows' opinions.

The same is true in this branch and in all the others on the list of this official program. You will see that the picture that we sometimes have seen of America being the melting pot for

Europe is a simile that can be well applied to the National Dairy Show. It is a place where all of these divergent interests can come together and get inspiration and growth and radiate this inspiration among those not so fortunate as to get here. This is a place where you meet the leaders, and you are only getting part of the opportunity if you confine yourself to the leaders in your own particular branch. You ought to know better the leading milk distributors in the United States, the leading breeders of dairy cattle, some of the men who own these valuable cattle down here, some of them the most influential men in their own communities and yours, though you may not have met them. The leaders of every branch of the industry are here, and it is not only a privilege, but a rare opportunity, to meet them.

I congratulate you on the growth your association is making, and the greater opportunities you are getting, and I trust the coming year may show an advance toward a purer milk supply. Do not forget to carry with you some lesson from this great exposition to the men in your communities who own the cows.

I congratulate you; I bid you welcome.



## RESPONSE TO ADDRESS OF WELCOME AND PRESIDENT'S ANNUAL ADDRESS.

C. J. STEFFEN, Milwaukee.

Mr. Van Norman, President of the National Dairy Show, permit me to say that it is indeed a pleasure to meet with you again. We are pleased to greet you at this time, and assure the Dairy Industry of our continued interest in its advancement.

This Association was founded to give impetus to organized effort for dairy uplift and dairy progress. We recognize the imperfections of the present methods of milk and dairy inspection and we hope to accomplish something in improving those methods.

The addresses which will be delivered at our convention will be replete with suggestions for our members along these lines. I hope this meeting will encourage others to attend these conferences, where by the exchange of views among representatives of the inspection forces we expect to bring about better conditions.

**Fellow Members and Gentlemen :**

Our Association has now entered upon the fourth year since its organization. From the time when we first launched this movement the officers, particularly the Secretary-Treasurer, labored earnestly and faithfully to promote the cause of better, cleaner and safer dairy products. The need for organized effort to spread practical dairy knowledge, and a better understanding of the economic factors influencing the production of clean and safe dairy products, was never more evident than now.

It would appear to one not familiar with the problem of milk production and distribution that all that is needed in any com-

munity is a proper ordinance, and the kind of milk defined therein will be sold forthwith in that city. Milk inspectors, and those who are familiar with economic dairy problems, must not be misled by idealistic and overdrastic laws when contemplating milk legislation. Bacterial limits, temperature requirements, and numerous other provisions are far more easily written and adopted as standards by law-making bodies than are those provisions capable of being practically enforced by the inspector, who must meet conditions as they are. This difficulty of securing compliance with dairy laws is increasing in proportion as such impractical laws are enacted by cities and states.

American dairymen are unwilling to surrender what they either rightfully or wrongfully consider their rights by conforming to such laws, unless they can see for themselves some additional compensation for such compliance. Sometimes they are pestered by incompetent inspectors who demand that they do things which seem trivial to the inspector, but which are an additional burden to the dairyman without bringing him an increase in revenue.

We are all agreed that milk, as compared with other food products, is one of the cheapest. The butcher, the baker or the gardener may ask 20 or 30 per cent more for what he has to sell and nothing is said, but let one cent be added to the cost of a quart of milk and it is immediately a subject for investigation by the authorities. Rest assured that as soon as the consumer stands ready to pay for the labor incidental to the production of a clean and pure milk supply, the producer will meet the demand.

Furnishing a people with milk, safe and wholesome, is after all not altogether a question of law, as we all know. Where is the dealer who has experienced any difficulty in supplying every demand for 15-cent milk? Generally speaking, I believe that the quality of the milk supply has improved faster than

the people have shown a desire to pay for improved quality. I am convinced that the clean milk problem is an economic problem as well as a health problem, and the sooner our political law-making bodies recognize it as such, the sooner will the present tendency on the part of the producer, to cease milking cows, be checked.

Constructive milk legislation must take into consideration the difference in methods of production on the thousands of dairy farms and should grade their product accordingly. By permitting only the highest grade to be sold in the raw state and compelling pasteurization of all other milk before being sold to the consumer, more protection would be given to the people than is afforded by all laws which now provide for the tuberculin testing of cattle, etc. If the consumer then became convinced of the greater value of the more expensive milk, the demand for cheap milk would become less. This would tend greatly toward solving the clean milk problem. Laws should give cities complete control over the sale of milk in their jurisdiction, in so far as is consistent with public health and public welfare. Various tests for impurities now at the command of the competent inspector afford him ample means of protecting the people from unclean, adulterated milk.

Laws defining ice cream, particularly butter-fat standards, and what ice cream shall consist of, as well as standards defining butter, should be agreed upon. Whether butter shall, or shall not, contain more than 16 per cent moisture, or whether ice cream shall be made of cream, are matters that may not only be very important as a protection to the consumer, but they are points that should be settled for the good of these industries so that they may be placed upon a stable basis, and such standards should protect producer and manufacturer, as well as the consumer, against fraudulent and adulterated products.

The need of uniform rules governing the methods of analy-

sis by chemists and bacteriologists of milk and dairy products, is plain to all who have to abide by the results of these findings. Bacteriological determinations of milk, cream and ice cream are often made public upon the findings of but one analysis. Leading dairymen and breeders look to yearly records, and persistent milking qualities, rather than the phenomenal daily or weekly record. Likewise it is my belief that the bacterial chart of a year's business done by the milk dealer, with frequent analyses showing a uniform and even control over bacterial infection, is of vastly greater importance than a few widely isolated tests showing phenomenal results.

In the drafting of many milk laws, the ideas of one individual rather than the practical teachings of really scientific authorities have been incorporated as the standard, and the politicians have found this a fertile field to cultivate and in which to grow votes. In many instances publicity has been given in advance of what it is proposed to accomplish, but, as a matter of fact, that ideal is rarely if ever reached.

There has been altogether too much said by men in authority about the danger of drinking impure milk. The press is inclined to favor such news, and mothers are continually warned about feeding their children impure milk. Health boards permitting such milk to be sold are narrowing the market for high grade milk without protecting the consumer.

The milk supply of our cities was never purer than now, and never cheaper as food when compared with other food products.

Let me say in conclusion, that I believe there is much less disease traceable to the use of milk at the present time than formerly. Let us try to teach the consumer how to care for the milk in the home. Let us labor to secure sane, rational laws as a protection against filth in whatever form we may find it. Let us teach the public by every means within our power

to drink and eat all that they will of the pure products of the cow, for by so doing they are supplying themselves with some of the best and cheapest foods obtainable.

*“The final solution of the milk problem will require mutual cooperation between the farmer, the consumer, the middleman, the health officer, the transportation agent and the legislator.”—Rosenau.*



## REPORT OF COMMITTEE ON INVESTIGATING CIVIL SERVICE CONDITIONS.

DR. O. P. THOMPSON, Waterloo, Chairman.

Your committee appointed at your last meeting to make an investigation and report to you upon the extent to which civil service rules are applied at this time in the United States in the selection and appointment of Dairy and Milk Inspectors, submit the following report.

For the purpose of securing data, we prepared a list of questions and mailed them, together with a letter of explanation and a stamped and addressed return envelope for reply. The only letters returned as "Unclaimed" were six addressed to Medical Milk Commissions, which fact seems to indicate that these commissions "weary in well doing."

We used Circular 204, U. S. Department of Agriculture, from which to select the following questions. In all we received sixty-six replies.

Question No. 1. "Are your milk inspectors taken from an eligible list?" In replying to this question 23 answered "Yes," 42 "No," 1 not answered.

Question No. 2. "How is that eligible list prepared?" This question would obviously require an answer only from those who answered yes to the first question. Of these 23, 21 selected their inspectors by civil service examinations under a commission, one "by competitive examination," one, "he must be a graduate from a recognized college."

Question No. 3. "What is the method of selection from such eligible list?" The replies would indicate that those receiving the highest marking in these examinations received the appointments.

Question No. 4. "How often do changes occur in the chief executive officer, or officers, in your city or state, charged with supervision of milk inspection work?" Of the number, 3 re-

plied "yearly," 36 every two years, 2 every three years, 13 every four years, 12 no answer.

Question No. 5. "What, if any, changes of the personnel of milk inspection force follow the change of executive head?" To this question, 52 replied "None," 8 "Complete," 2 "Infrequent," 4 no answer. These replies would indicate that a change of executive head does not, as a rule, cause a change in milk inspection force.

Question No. 6. "Are the milk inspectors paid by the state or city for their services?" Twenty-four answered "Both," 15 answered "State," 33 "City," 3 "not paid by either city or state."

Question No. 7. "Give briefly the duties performed by the inspector as follows:

(a) Inspection of sources of supply on farm?"

Fifty-six replied "yes," 6 "no," 4 "occasionally."

(b) "Does he use a score card for this work?"

Fifty replied "yes," 12 "no," 4 not answered.

(c) "Does the inspector determine the temperature of the milk as delivered?"

Twenty-one replied "yes," 19 "no," 15 "at times," 8 no answer.

(d) "Is a bacteriological examination made?"

Twenty-four replied "yes," 23 "no," 16 "at times," 3 no answer.

You will notice that nearly 80 per cent use a score card in this work, and of the samples sent me all but six are literal copies of the standard government score card. A few of the reports coming from the Southern States state that the government card is not applicable to their condition. Only about 30 per cent take the temperature or make bacterial counts.

Question No. 8. "What salary is paid the inspector?" While this to you is a most important question, it is one hard to answer, as many inspectors of milk are also food and sanitary inspectors, and it is impossible for them to say what pro-



portion of their salary is properly credited to milk inspection. For instance, in the State of Iowa, the law reads that local city milk inspectors "shall be paid at the rate of \$3.00 a day for time actually employed," and in some cities for only three to five days each month are they thus employed. This meager amount they draw for their work from the state, and in addition the cities pay from nothing to \$100 per month.

The replies show that the highest salary received is \$2,400, and the lowest \$180 per year. Thirty-eight receive \$100 or over per month.

Question No. 9. "Remarks." But few made. Recommended that inspectors be paid more.

#### DISCUSSION.

MR. THOS. A. BUCKLAND. There is one point stated in the report just read, that the highest man on the list submitted is to receive appointment. I think that is a very great mistake. A man might pass the highest examination, but be utterly unfit for inspection work.

PROF. H. A. HARDING. Those of you who have had experience with civil service know that it is in these things justified only in so far as it sometimes protects us from something worse. It is so absolutely impossible by any method of examination that has yet been devised to differentiate between the man who can pass a splendid examination and yet does not know which end of the cow milk is expected to be derived from, and the man who knows something about the dairy business, that we go to any qualified list with a good deal of misgiving. When the development of this dairy inspection subject has reached the point where we have fairly definite ideas of what an inspector ought to know, and some way of measuring his amount of judgment on the subject, an eligible list may be of some service.

DR. H. E. BARNARD. Indiana, across the State Seal, writes,

“Second to None,” but Indiana has never operated in the slightest degree under the civil service organization. We know nothing about civil service in that state, and from the point of view of the civil service expert I am unable to speak. I am not so sure, however, that in building up an organization of milk inspectors I would go to the farm or to the dairyman to get raw material. Frequently we have found that men who have been brought up in the business are unable to see the faults in connection with that business which are apparent to a man whose experience in the work is new. I think we have got to go farther back than the seasoned dairyman or the man appointed from a civil service eligible list, if we wish to secure the best service in our food control work. I am looking to the time when our institutions devoted to teaching men how to do things in the world will give adequate courses, and specialized courses in milk inspection work, as they are doing in some institutions now for public health work.

The best work is done by men who have taken special training to fit them for the work in hand. I think when we take men, trained at the universities, perhaps, for dairy and milk inspectors, that we will get more adequate service than it is possible to get, either direct from the farm or from the “eligible list.”

*“Education alone is not sufficient. The milk problem also needs conscientiousness. To guard against the lapses to which human nature is liable demands official supervision.”—Rosenau.*

## REPORT OF COMMITTEE ON DAIRY FARM INSPECTION.

DR. WM. H. PRICE, Detroit, Chairman.

In formulating its report of one year ago, which report was printed in the Annual Proceedings, the Dairy Farm Inspection Committee of the International Association of Dairy and Milk Inspectors was influenced by the conviction that such a report should be of a general nature and that details should be avoided for the reason that conditions and necessities vary widely in different localities.

In attempting to revise that report the same feeling prevails, and it is deemed inexpedient to add more than two general items to the report as already published.

Dairy Farm Inspection is essential to the production of a pure, satisfactory and wholesome milk supply. That the quality of the supply be pure, wholesome and satisfactory is essential to the public health and to the welfare of the dairy industry. The committee continues to believe that the greatest single factor in improving the milk supply is the score card of the National Dairy Division. Other factors are, however, useful, and the conclusions indicated by these various factors are not always harmonious. We would recommend, therefore, that experiments be conducted to determine the relative value of each of the tests employed by the members of this Association to the end that a single numerical rating may be assigned to each dairy farm, this rating to be established by the score, bacteria count, sediment test, and such other tests as may be necessary or of benefit.

We believe that the success of Dairy Farm Inspection is determined in large measure by the fitness of the individual inspector, which fitness is dependent on scientific training, as-

sociated with farm experience and qualities of personal tact and leadership.

The committee believes that the success of Dairy Farm Inspection in any locality requires stability of system and personnel, and, therefore, that continuance in office by dairy inspectors should be determined by fitness of the inspector and not by the exigencies of personal and partisan politics.

Mr. Chairman, Gentlemen: This is the report formulated by the committee. For a reason that may perhaps be apparent, this report is different from the ordinary paper, which is usually the idea of one man. We have endeavored to keep anything out of this report to which every member of the Association cannot subscribe. The result may be that perhaps this paper will seem to be platonic and impersonal and composed of self-evident facts. Without any preparation at all, I am going to elaborate some of my own ideas, which, of course, cannot be included in the report, as to what may be done about these things.

It is perhaps natural that dairy inspectors should consider that theirs are the chief and only problems of the Health Department. They are not. They are very typical of the problems which arise in the Housing Department. A person who is living in a house which is unsanitary, overcrowded, which is damp, has defective plumbing, perhaps windowless and without ventilation, is just as difficult to convince that it is not his exclusive affair as to where he lives as it is to convince the dairyman that he has not the right to serve any quality of milk that he wants to put on the market.

It is also a fact that it is just as difficult to convince a practicing physician of a large city that he is an essential adjunct of the Health Department, that the privilege granted to him by the state of practicing medicine implies willingness on his part and expectation on the part of the people of the state that he will conform to certain requirements made by the state, which

are essential to the protection of the public health. For instance, it is quite impossible to convince at least one of the physicians practicing in Detroit, that he is violating legal and moral principles when he refuses to report a case of typhoid fever or diphtheria.

So, the problems that confront the milk inspector are very similar to those which confront other branches of the public health departments.

The question, then, is what are we going to do about it. Mention has been made of education, and how can we best educate people about things that are so important to each individual as his health? On it depends his whole attitude toward life and his relationship with his fellow man. With such an important subject as this to deal with, it would seem that it would be a very easy matter to enlist the interest of the whole of the people and that it would be possible to educate them.

It has been possible to educate the people. It has been possible to educate them on the necessity for following wholesome ways and taking reasonable precautions, both for the improvement of the milk supply at its source, and also at the time of delivery, and also in the home, as we must agree. I shall have some figures to present later on in the day, showing that it is possible, and is at least as essential as at any other point, to educate the people on the care of milk in the home. It is possible to educate the people so that they demand that their doctor report contagious diseases. It is easier to educate the people than to educate a great many of these doctors, and the fact that the people have created health departments and have paid for them to look after those things in the interest of the public health which the people individually are not capable of looking after for themselves, is the very best proof that the people do realize the necessity of improvements in all these respects.

The question is also before us, how are we to increase the

amount of knowledge that the people have concerning these things? The fact that our death rates from most communicable diseases are constantly being reduced is proof in itself that we may take a more cheerful view of the situation than has been taken by some this afternoon. Diphtheria has been reduced marvelously, typhoid fever and tuberculosis 50 per cent from the figures of thirty years ago, and there is every indication, as I see it, that progress is faster than ever before. I believe it is one of the essential duties of the health official to take due cognizance of the duties he owes the people to take care of this by publicity and educational means. There are a great many things that can be done, and these things will perhaps vary in different localities. For instance, I know of one place where certain health officials found it possible to enlist the interest and cooperation of the ministers in a public health movement. I don't know of anything that is more practicable or would be more logically correct to be preached in the church than the importance and the necessity of observing those things which conduce toward an improved public health.

There are certain other communities in which it has been possible to enlist the active support of the women's clubs, and I know of one place in particular where an officer of the Board of Health was not succeeding very well, and was able through the interest that he stirred up in the women's clubs to give that town a most excellent public health administration.

It is possible for some people to go to the men's clubs in the churches and deal with this very interesting subject, for it is a subject that every one is interested in, and it may be possible for such a man to gather a friend here and there, and so be the means of passing this reforming education along.

The newspapers are the official organs of the people. They print what the people want. I believe that the tendency of human nature is to take a hopeful, rather than a negative, view of things in general. I believe that it is the idea of the news-

paper managers to be boosters, rather than knockers. They do print, of course, things that are unpleasant, but I believe in a general way they would prefer to be favorable.

It so happened that last fall the managing editor of one of the large newspapers in Detroit was quarantined with diphtheria, a member of the family being ill. During the time he was quarantined I called him up and asked him if he would like to go for a ride. I took him to the hospital grounds, where the city has spent \$500,000, and he actually wept when he saw the little children, some of them with the blood actually running out of their mouths. He never had had any idea that this had been going on, and he then and there told me that from that time forward, his paper would adopt as its policy the advancement of the public health, in preference to any other one thing.

I believe all these have a bearing on these problems. The fact that this congress of people, consisting in some cases of producers, of inspectors and representatives of the state colleges, are here together, is a token of the advancement of a better understanding regarding all of the elements which enter into this problem. I believe that is the best indication that we are going to arrive at the solution of this problem.

I believe a solution that would mean the disruption of the dairy industry would not be a solution at all. I believe there is some common ground where we can meet that will be of benefit to the dairyman and of benefit to the public health.

## DISCUSSION.

MR. BUCKLAND. We in St. Louis realize the force of what Dr. Price has said in regard to the help of the public, and especially of women's clubs. The trouble is, I think, that while they have very good intentions, they don't stay on the job long enough, and they are apt to act on insufficient information.

MR. A. N. HENDERSON. Within the last few years there

has been a course of elementary agricultural training started in all our public schools. This is going to have a great influence on our future dairymen, and I think if the dairymen are to be educated, it is going to be by educating the boys and girls who are to be our future dairymen. To make use of the public schools, in my mind, is to go a long ways in solving the pure milk problem.

Why not start our girls now attending our public schools in the cities and train them to understand milk, show them the value of the different grades of milk, the cost of the different grades, and, if necessary, show them how to make some of the elementary tests to determine good milk? If the city girl, the future mother, is educated along these lines, as well as the country boy, the future dairyman, it will be only a few years before we have real results. In my city it has been taken up with the domestic science teachers, and girls of from ten to fifteen years of age have visited the different milk plants and dairies. One of the teachers has made up a very nice course of instruction for children as to the care of milk in the home, the value of milk as a food and the economic value of milk in our dietary.

DR. N. C. DAVIS. You gentlemen may be interested in a plan that a dealer has tried out in Boston. We believe in education, but not unless somebody gets paid for it. I said last year we were going to try paying our dairymen a premium, based on inspection. We started that, but the health officers did not get around to inspect every dairy, and the farmers therefore did not get a premium. This year we have said we would not wait for the inspector, but we would put each farmer on the honor system, whereby he will score his own farm on cleanliness, and in that way we hope to encourage him by giving a premium for his milk. We find the educational proposition is no good unless the cash goes with it, and we also feel that when a dealer comes forward with that sort of a proposi-



tion, the inspectors should give him support and see that the farm is inspected.

PRES. STEFFEN. I believe the consumer is in need of more education at the present time than is the producer. In our city of Milwaukee there are about 500 quarts of certified milk sold to 400,000 people. We are producing in the nearby territory 5,000 quarts of certified milk and 4,500 quarts go to other markets, showing the consumer of Milwaukee is not willing to pay the price for this grade of milk. That condition is possibly indicative of many throughout the United States.

DR. PRICE. When it comes to judging the milk supply, it is a matter for the public officials to do. The people have no way of judging that, and inasmuch as they have no way of doing that for themselves, they employ a health officer and give him a salary and pay his expenses, and they depend on him to do that very thing for them. A few years ago, during the time of the trial by grand jury of which I spoke, the dealers had just raised the price from eight to nine cents, and the Board of Health of Detroit, figuring that was a reasonable requirement if the farmer was to get his percentage of profit on it, stood for that increase and figured they were representing the people's interest in not opposing that change, and nine hundred and ninety-nine out of a thousand people in Detroit accepted the ruling of the Health Department on that matter, showing they were willing to be guided by their authorized representatives. It would be a little bit too much to expect the individual to be interested in a bacterial count and sediment test. Individuals should be generally interested in those matters, but the public should be educated along those sanitary lines to the extent of having confidence in accepting the word of the Health Department.

PROF. J. H. FRANSEN. I sincerely believe that when a campaign of education impresses on the people the dangers of unsanitary milk, added to a campaign that they must pay a higher price for high-grade milk, the better milk will be pro-

duced. I have in mind as a particular illustration the conditions in the city of Omaha. Through his campaign of education there during the past year, the milk inspector, Mr. Bossie, created a ready demand for milk at three or four cents more than the usual price there, and the consumer is not only educated to understand the dangers of bad milk, but the added fact that he must pay more for the higher grade. One of the leading newspapers there fought the campaign hard, but when it was shown to them that good milk must necessarily cost more, they not only withdrew their objections, but became most hearty supporters of the campaign.

MR. C. F. BOSSIE. Some three years ago the dairymen of our city were complaining about the low price of milk. I immediately became interested in educating the consumer through the newspapers. I went to several dairies, averaged the cost of production, and through the newspapers told the consumers just what it cost to produce a quart of milk in Omaha. One newspaper took exception to my statements, until they detailed a reporter to accompany me on my trips to the dairymen. They were shown price lists for food, corn, alfalfa, and other feed, and the actual expense of producing a quart of milk. Soon after the editor of this newspaper sent for me and wanted a detailed and signed statement of what I thought was the actual cost of the production of a quart of milk at that time of the year, and also during the previous months. This was in the fall of the year, when feed was high, and it took more help to keep the dairy barn in proper condition. We require currying and grooming of cattle every day during the winter months, and that takes a little more labor. After I had given this editor the facts and figures, he readily withdrew his statement that the rise in the price of milk was unjustified, and stated that if the people of Omaha expected to get good, pure, clean milk, they must expect to pay a premium for it, or a little higher price than they had been paying. The price has been raised from six cents, three years ago, until now you cannot purchase

a quart of milk for less than eight cents, and in most instances it is nine cents. That has been my experience in the last three years, and the public is paying the increased price without objection.

MR. A. W. LOMBARD. We are at present, in Massachusetts, endeavoring to ascertain the cost of the production of a quart of milk.

MR. BOSSIE. I think in Omaha it is approximately six and three-quarter cents per quart to produce and deliver.

Sixty-eight per cent of our milk is produced, bottled and delivered by the producer, and the best milk that we receive in the city.

*"In the long run, no enterprise can flourish unless those who carry it on throw themselves, heart and soul, into its service."*  
—David Starr Jordan.



## REPORT OF COMMITTEE ON DAIRY FARM SCORE CARD.

PROF. C. B. LANE, Philadelphia, Chairman.

In presenting a report on the Dairy Farm Score Card, it occurred to your committee that a brief history of the card, as a factor in dairy inspection, might be of some interest to this organization.

The first attempt to rate conditions on dairy farms in terms of figures was in Washington, January 9th, 1904, when Dr. Wm. C. Woodward, the Health Officer of the District of Columbia, originated a score card for this purpose, which has been used now continuously for ten years. One of the features of this card was the provision for scoring equipment and methods on one side, and the scoring of the cattle on the reverse side. Following this, a somewhat different form of card was presented by Prof. R. A. Pearson, February, 1905. Both of these cards had many good features, and had they been generally adopted they would have done much to improve dairy conditions.

Following this, the Dairy Division at Washington, believing the score card system to be a practical one for the improvement of the milk supply, took up its use with the hope of extending it and securing more thorough inspection. A somewhat modified form of card was prepared in July, 1906.

Upon the organization of the Official Dairy Instructors' Association in July, 1906, a score card committee was appointed to prepare a card which would best meet the needs of dairy inspectors, with a view to its uniform adoption throughout the country. Besides the writer, the committee consisted of Prof. R. A. Pearson, then Commissioner of Agriculture in New York, and Prof. J. M. Trueman, then Professor of Dairying at the Connecticut Agricultural College. The committee prepared a card and submitted it at the second meeting of the As-

sociation, held in Chicago in October, 1907. The Association voted to have a supply of the cards printed and distributed for trial among the heads of the various dairy departments of the colleges, reports of the results to be sent to the committee.

At the third meeting of the Official Dairy Instructors' Association, held in July, 1908, the committee presented the score card in a new form, embodying as far as possible the suggestions submitted by the heads of the various dairy departments. This card, with a few minor changes, was adopted by the Association. The committee was continued to recommend any necessary changes at future meetings.

In order to promote uniformity in the use of the score card system, the Dairy Division at Washington has cooperated with the Association—a member of the Dairy Division staff being on the committee—in perfecting the card, and uses it in all official inspection work. Hence the card has the double endorsement of the Government officials and the Official Dairy Instructors' Association.

It would take too much space in this short report to enumerate the various changes that have been made from time to time, as experience in the use of the card seemed to warrant. It might be said in passing that in 1907 the dairy conditions were divided on the card under the general headings of equipment and methods. The score for equipment indicates the quality and efficiency of the "tools" the dairyman has to work with, while the score for methods gives an accurate idea of the way the dairyman uses his equipment and indicates whether he is practicing right methods.

In 1906 the card was thoroughly revised and simplified, 40 points being allowed for equipment and 60 points for methods, and the number of additions and calculations necessary to get the final score was reduced to three. In 1910, five changes were made in the card by vote of the Official Dairy Instructors' Association; in 1911, twenty-seven, and in 1912, eleven changes.

**EXTENT OF ITS USE.**

To state briefly, the card now adopted by the United States Government and the Official Dairy Instructors' Association is now in use in over 200 cities, 25 state departments and 50 educational institutions. It has been sent to every city in the United States having a population of over 50,000.

**PRINCIPAL VALUE.**

The score card is of particular value to the inspector as a guide in his work. It points out conditions, making it impossible to overlook any items of importance. It aids in keeping a permanent record of all conditions found, so that future comparisons can readily be made. It aids cooperation between inspector and producer, and incites competition among dairymen for high scores.

It is not a standard for closely estimating the quality of the milk produced on any particular farm, and was never intended for that purpose. If a dairy scores 50, it does not necessarily mean that that dairy is producing bad milk. On the other hand, if a dairy scores 95, this does not necessarily mean that this dairy is producing good milk, although as a rule the better scoring dairies produce the better milk. There is an element of efficiency of the dairyman himself which must be considered here, and a good dairyman frequently produces good milk in a poor stable; on the other hand, a poor dairyman would turn out poor milk with the equipment of a certified dairy.

It should not be considered defective merely because it does not measure the sanitary properties of milk. It was never intended to be used to determine the quality of milk. To pass on the quality of milk it is necessary that it be examined by the chemist and bacteriologist and that it be scored for flavor and

cleanliness, etc. We have a score card exactly for this purpose, and I think it would be a mistake to attempt to attach points on a dairy farm score card for the cleanliness and bacteria count of the milk. The equipment and methods in a dairy are one thing, and the product another, and we have separate score cards thoroughly covering these two fields. There is some tendency now to eliminate from the score card the things which cannot be proven to directly contaminate the milk. This seems a mistake. For instance, you may get low bacteria when the manure heap is next to the cow stable, but should we allow such surroundings? It may be proved that you can get just as low bacteria by not whitewashing the stable walls, or by allowing the cobwebs to hang from the ceiling, but are these the proper conditions for handling milk? Is there not a question of decency which comes in here, and which the score card should cover, regardless of direct effect upon the milk? We think there is. The housewife keeps her kitchen clean, not that the food will necessarily be contaminated, but as a safeguard to the food that is handled every day, and in order that the surroundings may be respectable, habits cleanly, and there be an atmosphere of refinement.

#### LIMITATIONS.

We all recognize the fact that it is difficult to devise a card that is adapted to all conditions alike. The chief difficulty is that the same items do not have the same significance in different climates. New England offers one condition, Colorado another, and Florida and Southern California another. In the first instance, the cows are stabled one-half the year, in the second, one-fourth, and in the last, not at all, except for milking. The question of light, ventilation, stable construction, etc., varies in importance, but the inspector should be able to interpret the card to cover any locality.



## DISCUSSION.

MR. LOMBARD. Would Professor Lane advise constantly changing this score card? In Massachusetts we have a new law, going into operation last August, in which all producers and dealers in milk have to have a permit. This is issued by local Boards of Health, and the local Boards of Health of Massachusetts, through the instrumentality of our State Milk Association, have decided upon a basis of 50 upon the United States Government Score Card for issuing these permits. The cities find they have a large number printed more cheaply than a few and have laid in large numbers. If a change is made, it means throwing away large numbers.

PROF. LANE. There have been as few changes as possible. No change has been made for two years, but once in a while we have to make some change. However, if cities have had cards printed, I see no reason why they should not be permitted to use them. When a new lot is printed, it would be very easy to get an up-to-date card. The Department at Washington is very willing to send score cards to any health officer who wants to use them.

DR. DAVIS. Mr. President, I don't believe that a score of 50 or a score of 75 means anything to the producer, and I am sure it does not mean anything to the consumer, and I am wondering if it would be too radical at this late day to get a score card where the producer would have to do certain fundamental things that would put him in a class, and if he did not do certain fundamental things he would be in another class. Both the consumer and the producer would understand that. I don't believe that the average milk consumer would understand what a score of 68 or a score of 75 meant, but they do understand what it means for a man to cool his milk, to have a milk room or to have four square feet of light or whatever it may be. I think eventually some one is going to devise a score card which

the producer will understand and which the consumer will understand.

MR. HENDERSON. We have a score card in the form of a chart as high as this room and ten feet wide, that we put before our consumers and enlighten them on every point on the card. The score card is referred to always, and it is very seldom that we have to stop and explain what the rating means. We have educated the people along those lines. It is really amazing how the consumer will take to that card and understand it.

MR. R. I. GORDON. My opinion of the score card is that it is just an incentive for a person to do better. If you score him 100, he is going to stop right there. I had some trouble down in Tampa. I told my men to be very careful not to give anybody a high score. We started with 50 per cent, and only two got that. One of the best men made a visit to a neighboring city and he found some places that were not in as good condition as his place, and in the paper they had published a score of 95. He came back to Tampa and came before the city council and said he would like to appoint a committee to investigate, and he was willing to wager a hundred dollars that his place was in better condition than the one in the other city scoring 95. They let him have a committee to wait on me. I told them in my opinion there was nothing perfect, and I have always refrained from giving perfect ratings. I see a big difference in every city I visit. They have all kinds of scores, from 50 to about 98. Those who score 98 would score about 80 in Tampa. I think every member of this Association ought to get some standard to go by, so that these things would not come up.

DR. THOMPSON. I had an inspector in one city in Iowa. As I remember, the average score in those days was about 65. He was a good man and he worked hard. The unfortunate thing was that the scoring of these dairies was published in the local papers. The dairymen were much interested and read all the scores. It went on about a year, and in the meantime, this man had been doing educational work, and I thought was doing

first-rate. At the end of the next year, when he came to score these dairies, their average was 54. It was not very flattering to him, and, fortunately or unfortunately, one of the members of the city council noticed this proposition. "What does this mean? You scored these dairies 65 last year, and we have been paying you a whole year and so has the state, and they are ten points lower this year than last." The facts were these. I tell you this to warn you against this one proposition. This fellow gave a dairyman credit for what he was *going to get*. He was going to get small-top milk pails, and more windows, and this and that, and the inspector was a good fellow and he gave the dairyman credit. The next time he went around he found he had not done what he had promised. The inspector was not in a very good humor, and he cut him down very low, perhaps lower than he really should have done, but he did it to pay him off.

One question has bothered me on this score card. In Iowa, as I remember, one point is given for having a milk cooler. I am not very clear in my mind just what you mean by milk cooler. Some milk men have one of these milk coolers where it is cooled from each cow first. Then there are other fellows who have tanks where they set their cans, and some do not have even that. Of course, personally, I have been giving the fellow who had a good tank, and where the water was changed constantly, about one-half a point. I have been giving the fellow who had a regular milk cooler one point, and the other fellow none. I would like a little enlightenment on that one point.

PROF. LANE. The milk cooler on the score card means a separate cooler. There is some advantage in cooling this way. This has brought up another point which is very important. Here is a man who has a good cold spring of running water, and he sets his can of milk in that spring of running water and he stirs that milk and cools it down, not quite as quickly as the separate cooler, but much more quickly than if he let it set outside, and I think Dr. Thompson is justified in giving that man

half a point. Every inspector has to use some personal judgment, depending on the conditions he finds.

MR. M. S. SCHROCK. In regard to the use of the score card and the difficulties this gentleman got into, I believe if every inspector is made to read carefully the bulletin issued with the score card, there will be very little difficulty in uniformity of the work. In our work in Oregon, when we have a new man we drill him and send him out with an older inspector, and they score side by side, without any communication between the two, and then compare notes, and do that several days. Portland, the only large city in the state, has a large force, and we get together and talk over these things. We do not give any credit unless they really have coolers, on the equipment side, but you can give the man credit for effective cooling. In a case where a man sets his milk in a cold spring, he can get considerable credit there, and those are large points, compared to one point on the equipment side.

We make it a point to publish the scores of the dairies supplying the cities with milk. We are so wrapped up in this score card question that we have attempted in our other work a similar score card, modeled after the dairy score card, to score restaurants, bakeries, etc., and when we go through any town we publish in the local papers scores of all these places. We then make an attempt, usually, to explain somewhat the dairy score card, and if any extraordinary conditions exist—for instance, if a man has rather a nice score on methods, and is low on equipment—we make mention of the fact that this man's score is perhaps a little low. For instance, we say, "The scores here published show fairly accurately the conditions as they exist, with the exception of this man." Perhaps another man has fairly good equipment, but he is wholly incompetent in that kind of work.

We used the score card on dairies throughout the state selling cream, and the general average was 39. I think we have less than half a dozen dairies that have ever scored over 90.

We find it is human nature to fall into a rut, and we go out, two or three at a time, and score together, and we also send another inspector out to score a few dairies which have been scored recently, and compare the two score cards, and not let one know the other has scored it. We at all times make a carbon copy of all our score cards and leave with the farmer.

DR. WEISBERG. There were several points upon which I want information, but there are several things about the score card that hardly apply to a city like Chicago. For example, it would do us no good at all here to publish the dairy scores, because the ultimate consumer in Chicago knows nothing about the farm. The milk dealer here has so many farmers supplying him that to his patrons a knowledge of their scores would have but little value. We have here an ordinance that divides the farms into two classes, and the milk into two, that which may be sold raw, called inspected milk, and pasteurized milk. One gentleman said 68 per cent of his milk was sold raw and was the best milk in the city. Eighty-two per cent here is sold pasteurized, and with very few exceptions, is the very best sold here. Our ordinance includes the Federal score card, and requires that farms supplying milk that is pasteurized before it is sold must score at least 55, and those selling raw milk must score at least 65. Beginning with June, 1915, they must score at least 70.

We have had considerable aid in bringing up the scores on the farms from the larger dealers. The four or five largest dealers in Chicago pasteurize all milk, and while the requirement for their supply is only 55, practically all of them notified their farmers that they would pay them ten cents a hundred premium if their score came up to the inspected milk grade. What are called the average figures have moved up within the last year from between 55 and 60 to between 61 and 64. Since the larger companies have offered premiums, the farmers have improved—the larger number of them—to that extent. Some

five or six or eight years ago, the average was about 43. So we have improved considerably.

Our ordinance requires that all milk must be immediately cooled, and shall not be transported at a temperature higher than 60 degrees F.

On the equipment side of our card there is one point for a cooler, but on the method side there is a number of points, and the temperature to which the milk is cooled is what counts. Since the greater part of our milk is delivered to the country plants, I will admit that from investigation we have found that very little of the morning's milk is cooled at all, especially during the busy season of the year.

The average haul of milk in the city of Chicago is in the neighborhood of 42 or 43 miles, but some of it comes from 125 to 130 miles, and the cream very much farther. Unfortunately the milk-hauling roads have no facilities for keeping the milk cold, and there does not seem to be any disposition to do anything of that sort. Milk comes into Chicago in the summer time from 70 to 80 to 100 miles away, in cars with open doors, stopping every few minutes. The milk is often very far from 60 degrees F. when it gets here.

Farms have shipped milk to Chicago for a half century or more, which never saw an inspector until this year, because the appropriation for expenses has never been sufficient to cover them, and until this year we have not had inspectors enough. This year we scored practically every farm, and have reinspected over 50 per cent. We have never been able to inspect every farm once in six months, which is the best we ever hope to do. There are between 13,000 and 14,000 farms supplying Chicago, and we have kept fifteen men in the field this year. Last year we started out with about twelve men. After the first or second month, we had to cut down to six, and the last three months no one was in the field, because there was no money to pay salaries or expenses. The city council last year granted \$10,000 for dairy inspectors. Our expenses are about \$20 a week per man, including rig hire, hotel bills, etc.

QUESTION. I should like to ask the Doctor if the dairies are scored only once a year, whose score is taken for the ten cents' premium.

DR. WEISBERG. The Borden and Bowman Companies have their own inspectors. This one year's scoring lasts another year—the contract time. The milk dealers in this district make contracts for their supply twice a year, in March and in October, and they base their premium on the score at contract time, with the agreement that if during the contract period there is an inspection made and the score raised, they will pay the premium for the entire time.

PROF. HARDING. The statement just made that a milk company is willing to use this score as a basis for paying more money for better milk touches upon a new situation in the milk business. This practice originated, I believe, in the New York market two years ago, and was tried a little this last year and the present year in the Chicago market. The experience of the Borden Company of the New York market the first year was that the payment of ten cents bonus for definite things had done more to improve the quality of their milk supply than all the money they had spent on veterinary inspection, etc., up to that time.

That puts up to the inspector a new and rather serious question. Is this rating which he is giving a satisfactory basis for doing business? Is it fair to all parties concerned? And again, if extra money is going to be paid to the producer for higher scores, is the inspector sure that those higher scores are in turn going to turn over to the retailer and the consuming public milk of higher value? Does our score card actually measure the quality of the goods put upon the market? As the chairman of the committee has well said, it does not. It was never intended to. It was gotten out as a way of comparing and improving dairy methods and dairy equipment. The committee agreed at the meeting in Philadelphia three years ago

that the score card, as we now have it, lacked much of measuring the quality of milk. It was never intended to do that. Instead of trying to put it through a revivifying process and shifting it over to where it would—incidentally making all the disturbances you refer to—a section of that committee attacked the problem of making up a score card which would actually measure the quality of the goods as it came on the market, and a subcommittee of the main committee was set aside for that particular problem, and they have wrestled with it from that time on. Manifestly, one of the first things mentioned was an inspection of the dairy, from the cow to the consumer, to ascertain as accurately as possible, the importance of various dairy operations. Part of that work had been done in a way. Fifty thousand dollars has been put into the investigation and part of the data is available.

The matter was far enough along a year ago so that it was deemed wise to come to this Association and ask its cooperation, because it is a wide field, embracing the whole question of production, transportation and distribution.

Reports concerning the barn air and barn conditions at the New York Experiment Station are on the press now, I think, and will be distributed within a month or two, I hope. The gist of the investigation there is that the barn conditions have no measurable influence on the quality of the milk, where they are decent or better. I was somewhat surprised at the lack of connection between the conditions of the barn and the quality of the milk produced in the barn. It was surprising that there could be dirt and disorder without any appreciable effect on the milk. The lack of connection is alarming, to say the least. The barn air is surprisingly ineffective. I was more than surprised the way the results of those measurements came out, as well. I began to wonder what it was that influenced the milk.

Dr. Prucha and his assistant have put in this entire year in measuring the condition of utensils, and there we seem to have



a harvest. The condition of utensils is important beyond my thought, and until the results began to come in, I had no adequate conception how preeminently important the condition of the utensils was, at least in the germ content of the milk.

And so, when this score card is finally worked out, it will have surprisingly few items and will do away with a good deal of the difficulty there is at present, and will be reduced to what is really important, with some notion of their relative importance, based on careful studies, made under a fairly wide variety of conditions. This won't be perfect. I expect at first it will be pretty crude, and still I have hopes that it will be much more workable than we had any reason to hope earlier in the work. In another year we ought to have a fairly complete set of observations, but one of the great lacks is a knowledge of what the conditions are in regard to the transportation end.

How long is it from the time the milk is drawn until it gets to the consumer, and what are the temperature conditions it meets from the cow to the consumer? This Association can help materially in giving us a measure of the various conditions throughout the country, and the actual practices which exist. This classification cannot be expected to work unless it is made in the light of knowledge of the actual conditions. Later, when these blanks are sent to you by your committee, will you kindly do your part to get this information to your committee, so that when we get this out it will be gotten out in the light of a reasonably exact knowledge of the actual conditions. A blank is a blamed nuisance, to put it mildly, and it is very easy to leave it on the shelf permanently, but remember that part of this movement toward better conditions rests on you, so help it along.

**PRES. STEFFEN.** I want Mr. Bossie to tell us how he has induced his people to use the small-top pail, which I found so generally in use on the farms there.

**MR. BOSSIE.** Monthly we published the score, the average

bacteria count, the result of the sediment test, and the amount of butter-fat found in the samples in each of the daily papers. Without the daily papers I would be practically helpless. The milk producers' desire to get a higher rating or score resulted in all of them buying and using the small-top pails.

MR. ————. It seems to me when the results of Dr. Harding's committee are published, that the small-top milk pail may be relegated to the past, together with other theories. The small-top pail was purely for a protection against stable air, etc. Unless I have misunderstood Dr. Harding, we don't longer have to worry about the small-top pail.

PROF. HARDING. I suppose that most everything can be taken most ways. That time it was taken other end to, as I expected. The situation is something like this, apparently, in a barn. The light particles of dust that fly around in the air are so dry that nature has pretty completely sterilized them, and they are ineffective in the case of milk. On the other hand, particles of solid manure, large enough to carry small amounts of moisture, do carry germ life, and so-called dry pieces, which are not after all so very dry, and loose hair, do all carry large numbers of germs into the milk. A small-top pail—that is, a good small-top pail—will cut off easily 50 per cent, possibly 75 per cent, of this material which would have fallen into the pail, and to this extent reduce contamination taking place at the time of milking. The condition of the cow's coat is important, because that material will fall directly into the milk pail unless some precautions are taken to keep it out. The small-top pail will cut out 50 or 75 per cent of that, and is therefore a simple precaution and one which well repays the expense and bother. When you have a small-top pail, 5x7 inches, not too high—not over a foot high—one can ordinarily milk into it with quite as much comfort as into the ordinary milk pail, and that type of small-top pail will be used by the farmer with good nature. Any farmer knows you can hit a cat in the ear with a stream of milk a long way off, and a good

milker can milk into an opening 5x7 inches without any inconvenience. The small-top pail is a very simple and cheap and efficient aid in the production of better milk.

MR. WELD. The Health Department of Washington has a score card on which the small-top pail counts for 10 instead of 5 points, and the small-top pail is rapidly coming into general use. Its use is required by the largest dealer in the city. One producer, when asked what he found most difficult in using the pail, replied, "The most difficult thing I experienced was to make up my mind to try to use it. As soon as I really tried to use it I had no further difficulty."

MR. BUCKLAND. The inventor of a pail came to me at Syracuse four or five years ago and asked me what I thought of it. I told him frankly it was a contraption of the devil. The next year he had another pail, and told me he had sold the first in Boston.

Several years ago I studied the matter of the small-top pails at Geneva, New York. We discarded all cloths and all substances except the plain tin, because in the long run they increase, rather than decrease, the germ content, as well as increase the difficulty in using the pail. We avoided using a pail that was too high, for the milker will strike his hands. The pail should not be higher than 12 inches, with an opening as large as 5x7 inches, and you can milk into it easily. Many pails have so small an opening that it is like trying to milk into a jug. The simplest, plainest tin pail, so constructed you can clean it, big enough to use, small enough to keep out dirt, gives you a more satisfactory result than any of the complex, difficult contraptions.

MR. LOMBARD. We are recommending the use of any pail with a small opening which the producer can use conveniently, and some make use of one type of pail and some another. We have in our state many small-top pails in use, brought about by the clean milk contest, governed by the State Board of Agriculture, where prizes were offered for the production of

clean milk, decided by the sediment test alone. Samples consist of unstrained hand-drawn milk of five cows, all taken in the regular way. An inspector visited every place at milking time, and the samples were taken and the producer filled out application blanks, and prizes were offered for the cleanest product. The milk inspectors had for a long time been advocating the use of the small-top pail, and had found it difficult to get many to take it up, but as a result of the milk contests, a great many of our producers to-day are using some type of pail with a small top.

*“Clean milk may be produced with clean methods and poor equipment, but good milk cannot be produced with a good equipment and poor methods.”*

## REPORT OF THE COMMITTEE TO STUDY METHODS FOR THE CONTROL OF BOVINE TUBERCULOSIS.

HULBURT YOUNG, V. M. D.

The control of bovine tuberculosis appeals to your committee as a duty imposed upon mankind, not only on account of the fact that the continued existence of this disease in dairy herds is a menace to the human family, but also on account of its economic aspects.

That this disease is transmissible to mankind is a fact now accepted by practically all who have studied the matter at any length and we will not, therefore, devote time to discuss the evidence that has led to this belief. Whether we accept the doctrine propounded by some workers in this field, that infected milk is the causative factor in a considerable proportion of cases of human tuberculosis, or whether we hold with those who lean to the view that it is the cause of but a negligible number of such cases, is more or less immaterial for the purposes of this discussion. Any review of the evidence brought forth by the followers of these respective doctrines would necessarily lead, in any final analysis of this proposition, to a further discussion of whether the bovine organism is capable, when transplanted into the tissues of the human or an allied family, of taking on the characteristics of the organism usual to that host, or whether it preserves its bovine characteristics under any and all circumstances. Admitting that the macroscopic lesions, post mortem, in a case of generalized tuberculosis in man differ quite materially from those presented in generalized tuberculosis in a cow, nevertheless there are numberless records of cases of tuberculosis in man, particularly in the child and youth, where not only are the lesions comparable to those of cattle, but the organism recovered from lesions presented all of the characteristics of the bovine type.

From an economic standpoint, tuberculosis claims our attention not only on account of the direct losses by death and condemnation of carcasses and parts of carcasses, but also on account of the infection of hogs and other susceptible farm animals and the losses due to a diminished milk supply and the cost of feeding animals struggling against the ravages of the disease.

The direct losses by death are probably almost negligible as compared to the others. The losses by condemnation vary according to the neighborhood and the rigidity of inspection. Although statistics are to be had as to the amount of losses by reason of the operation of the Federal Meat Inspection Act, no accurate estimate may be made as to the losses due to diminished milk supplies and to excess feeding of infected cattle.

Granting, then, the necessity for the control of this disease, a study of the methods which have been proposed to accomplish this object reveals almost as many ideas on the subject as there are men to propound them.

Practically all agree that nothing is to be accomplished by working in the dark. Publicity, then, is the first requisite in any method. The known facts which it seems absolutely necessary to publish are about as follows: First, that the disease is caused by a specific organism, the tubercle bacillus; second, that no cattle show any inherent immunity, no matter what the breed, the size, or the conditions surrounding their maintenance; third, that the disease is conveyed from an infected animal or infected material to uninfected animals; fourth, that good housing conditions tend to retard its spread, and bad conditions to hasten and favor its spread, even though its onset is slow. In explanation of this last statement, be it said that whereas most household and farm diseases may be recognized almost immediately, tuberculosis frequently may not be so recognized either in an individual or in a herd, by the exercise of the usual powers of observation, until some in-

dividuals are badly infected and a considerable proportion of the herd invaded.

It is doubtless true that some individuals recover from the disease to the extent that their lesions become walled around with fibrous tissue. It is, unfortunately, also true that these healed cases become open cases and quite capable of again spreading the infection by reason of the breaking down of these fibrous walls on account of inclement weather, the strain due to calving or similar causes.

The recognition of the disease in an individual animal by other than laboratory methods is difficult. Unquestionably, many cases in advanced stages, so-called open cases, may be recognized by physical examination. Not all such cases may be so recognized, however, and a dependence upon this method of diagnosis is dangerous. Of laboratory methods for its recognition, we have the various methods for the examination of the excretions and secretions of an animal, and the tuberculin test. Of these, only the tuberculin test need be considered.

In skilful hands, the tuberculin test, that is, the subcutaneous tuberculin test, seems accurate in above 98 per cent of cases. It errs, seemingly, if at all, in locating cases in which definite nodules cannot be demonstrated post mortem, in failing to locate cases in the incubative stage, and in failing to locate healed cases.

Necessarily the application of the tuberculin test, at suitable intervals, and the consequent location of the infected individuals, bring up for consideration the problem of the proper disposition of these individuals and of their milk supply.

Whether we view with alarm the sale of milk from tuberculous cattle for human consumption under any and all circumstances, or believe that the sale of this milk should be permitted after it has been rendered incapable of transmitting the infection, we must admit that there is probably no community which can boast of having a milk supply drawn entirely from cattle which have successfully passed several suc-

cessive tuberculin tests. There are, however, quite a number of herds of which this is true, and should the number be multiplied indefinitely, the public health problem suggested would be solved without further trouble.

It seems quite evident to your committee that the complete eradication of tuberculosis from the cattle which supply any community with milk will never be accomplished without at least the partial, if not the complete cooperation of the owners of those cattle, irrespective of whatever laws and regulations may be promulgated to accomplish this end by compulsion. If this be true, it seems to us that no better plan to accomplish the desired end has been brought forth than that proposed by the International Commission on the study of methods for the control of bovine tuberculosis, presented at the meeting of the American Veterinary Medical Association in 1910. Briefly, the conclusions of this committee were that the control of this disease involved a different procedure under two distinct conditions, namely, first, where a herd is free from tuberculosis and is to be kept so; and, second, where one or more animals in the herd are infected and the purpose is to eradicate the disease and establish a sound herd.

Under the first condition the procedure outlined is simple. It is proposed that the herd owner avoid any and all exposure of the animals to infection, including infected stock cars in transit to stock fairs and exhibitions, the use of milk as food for calves or hogs when said milk has been produced by some other herd, and that care should be exercised that all cattle purchased for entry into the herd should be from those likewise free from the disease. Your committee feels it necessary to amplify this last dictum in that we believe it a better practice to treat all animals added to the herd by purchase as suspects until they have successfully passed two tuberculin tests applied at least six weeks apart.

Under condition two, it is recommended to consider infected herds as falling under one of three classes: First, where



50 per cent or more of the herd are proved to be tuberculous; second, where 15 per cent or less are infected, and third, where from 15 to 50 per cent are infected. Herds of the first class are to be considered as entirely tuberculous. All animals showing physical lesions are to be slaughtered and an entirely new herd is to be built up from the offspring, the calves being taken away from their mothers at birth and raised on pasteurized or sterilized milk. This new herd is to be kept entirely separated from the old, and the members thereof are to be tested every six months. All reactors are, of course, to be placed with the old (tuberculous) herd. As soon as this free herd attains some size, the old herd is to be entirely slaughtered and the infected premises disinfected.

In herds of the second class, any reacting animal showing physical lesions or symptoms is to be slaughtered, the balance of the infected animals are to be maintained separate from the main herd, their milk is to be used only after sterilization or pasteurization, their calves removed at birth and treated as in the herds previously mentioned, and when the number of infected animals has reduced to a point at which it may be done without considerable loss, all are to be slaughtered. During the period of the maintenance of the small tuberculous herd, the alleged healthy animals are to be tested every six months and all reactors immediately removed therefrom. It is further stipulated that under no circumstances shall a reacting animal be returned to the healthy herd, quite irrespective of the result of any subsequent tests.

Again your committee deems it necessary to call attention to a modification of the above recommendations. It is quite apparent that the maintenance of two herds on the same farm will entail considerable trouble and financial outlay. Unless, therefore, the 15 per cent of tuberculous animals are specially valuable for breeding purposes, we believe it the better policy to slaughter all of these animals as soon as the presence of the disease has been discovered.

Herds of the third class mentioned are to be treated either as those of class one or as those of class two, the circumstances surrounding their maintenance to govern which procedure is to be followed.

The general rules recommended to be followed are as follows: First, all animals showing physical symptoms of the disease are to be immediately slaughtered; second, no milk from reacting animals is to be used as food for man or beast until after having been pasteurized or sterilized; and third, all premises occupied by infected animals and all utensils used in connection with their maintenance or the care of their milk product or excreta are to be disinfected or sterilized before being used in connection with the maintenance of healthy cattle, the care of their product, etc.

*“One man alone cannot fight the fight against the common foe—infection; it takes the combined intelligent cooperation of the community.”—Rosenau.*

THE RESPONSIBILITIES OF STATES AND MUNICIPALITIES IN PROTECTING THE PUBLIC FROM MILK-BORNE DISEASES.

H. E. BARNARD, *State Food and Drug Commissioner*, Indiana.

To every one except the dairyman the danger of milk-borne diseases is neither slight nor far distant. A study of the causes of epidemics frequently carries the investigator back to the dairy. Typhoid fever was for years held to be a water-borne disease. The records of typhoid epidemics in Indiana for several years past show that it is far more commonly a milk-borne disease. But it is not necessary to point out to this association of men whose business is the regulation of the milk supply, the danger inherent in the use of milk containing pathogenic bacteria, and I do not propose to take your time in rehearsing statistics which more properly belong to the files of the health officer. My only purpose in talking to you this afternoon is to make plain my position as a food commissioner that the problem of a pure milk supply is not one to be handled from the State Capitol.

A satisfactory meat inspection can never be attained unless the state assumes the responsibility for stamping out bovine tuberculosis and hog cholera. Prepared foods will never be surely clean until the state requires sanitary conditions at canning factories and manufactories. The state must compel all employees to bear certificates of freedom from disease and employers must insist upon such certificates as a prerequisite of employment. Proper handling of food in transportation within the state can only obtain under such legislation.

State authorities can work in fields where the local official cannot hope to enter. There is now developing throughout the country the reasonable belief that the men intrusted with the health of the state should be trained in the service and immune from the disasters which usually follow the overthrow

of one political machine and the success of another. Permanence in position gives the state official an opportunity to develop methods of work and secure results which are not possible in local communities where city officials, no matter how willing, no matter how well trained, are too frequently handicapped in their efforts by reason of the fact that their friends, supporters and neighbors are frequently out of harmony with the ordinances they are called upon to enforce. Such conditions do not confront the official whose office is at the Capitol, for if he be large enough his work proceeds without knowledge of politics, of friendships, or of local conditions which make for law violation.

To state authorities must be left the development of a state meat inspection service. Some cities can take up the work where the Federal inspectors leave it off and provide a satisfactory inspection, but the smaller cities and the country towns where the local butchers flourish cannot provide an adequate inspection. That can only be done by the state, and it is the duty of the state to provide it.

What, then, should be the function of the state in the regulation of the milk supply? I believe pure milk is largely a local issue to be settled locally. I would once have said by local health officers, but since I have watched the development of certain dairy industries in my own state, I am now tempted to modify my opinion and say that it is to be settled by the dairy interests.

The state with its well developed means for spreading the gospel of cleanliness can do much in paving the way for the production of clean milk. It can give wide publicity to the close relation between infant mortality and the quality of their food. It can lay the facts before consumers, but it cannot, nor should it, assume the responsibility for the quality of milk produced in the thousands and thousands of dairies operating within its territories. In my state there are perhaps forty thousand dairymen who are serving their community, some of

them only a single family, many of them only through the butter they barter at the country grocery store or to the huckster who visits them each week. But all of them contribute their quota of dairy products. How can any state department hope to exercise even a supervisory control over such a host?

Dairy inspection should be a function of the local health department, but more than that, it should be the duty of the milk distributor. Since a firm or person engaged in the business of distributing food must assume all the responsibility for the quality of that food, the milk dealer, whether his business be large or small, for his own protection must know of the conditions at his producing dairies. That means inspection independent of law enforcement and purely as a business proposition. Many cities are requiring that their milk supply be produced by tuberculin tested cows. It is a difficult and expensive matter to enforce such an ordinance. The several states have from time to time passed laws providing for the tuberculin testing of dairy animals, but such legislation has been only partially successful. The dairyman still maintains that if the state kills his cow the state should pay for it, ignoring utterly the fact that it is cheaper for him in the long run to have his cows destroyed than to continue them a constant source of infection in his herd. The state should, I maintain, take hold of the problem of bovine tuberculosis and settle it, not as a dairy problem but as a public health problem, and some day the health authorities will use their extraordinary power to eliminate bovine tuberculosis, if before that time the dairy interests do not themselves eradicate it.

Much may be done by state officials in suggesting and assisting in the passage of dairy ordinances. At the present time, too frequently the drafting of milk ordinances is left to local officials who are not familiar with the successes and failures of other cities in regulating the quality of milk, and who therefore draft an ordinance impossible of enforcement, arbitrary and

unreasonable, or fail to secure for their citizens the protection they seek to provide.

I have said that the question of the control of bovine tuberculosis should be handled by the state, and that state officials may help materially in the drafting of model milk ordinances. The state can, of course, encourage the business of dairying, but the efforts of the state in these directions do not insure pure milk for our babies and clean milk for every home. When every form of food adulteration has been driven from markets and manufactories, when every grocer and butcher, every baker and confectioner have learned that cleanliness is a business asset and filth a heavy load to carry, the greatest of all food problems will still remain unsolved, and, except for brilliant individual efforts, almost as far from solution as when the first food law was enacted.

There has been no dearth of solutions suggested. There has been no lack of striking examples set up as complete and final answers to the problem. There have been scores of stories written of the model dairies and the purity of their product. But all the work of successful health officers and milk inspectors and the hundreds and thousands of model dairies has accomplished almost nothing in comparison with the task set for the sanitarian who is trying to find a pure milk supply for a large city instead of for a few families. For every model dairy there are a dozen that have almost no redeeming feature, either in equipment, management or character of output; for every story of tested herds, cement stables, sanitary milk houses, there might be written a hundred of diseased cows, dilapidated barns, impure water, inefficient equipment and careless and ignorant methods.

Pure milk may be possible for a village; yes, even for a small city where the product of a dozen herds meets every need, but as soon as the community grows beyond the power of the immediate country to furnish it with milk, almost every hope of an inspected supply is lost.

I know these statements are rank heresy to hundreds of earnest, able health officers and inspectors, who have done wonders in meeting the demand for a pure milk in their city. I know that thousands of conscientious dairymen will hold my statements so radical as to be without foundation; but the facts are in my hand. I speak from knowledge of conditions in more than one state and in scores of cities. The thousands of analyses in the files in my office are absolute proof of the futility of trying to improve the milk supply by legislating butter fat into milk or eliminating the pump by statute. They show as clearly as the table of infant mortality how impossible it is to educate the dairyman through the power of the police court.

The remedies proposed for this most unsatisfactory condition of the dairy industry have been varied. Perhaps the first attempt to control the purity of milk was by enacting a certain standard of butter-fat. Under such laws, which are in force in every state, which are explicit, definite, clearly understood by every man who sells the milk of a cow to his neighbor or the product of a herd of a hundred to some distributor many miles away, and by which scores of violations have been punished in every community, we stand to-day as little protected as when the first bottle was taken to the chemist for analysis. From time to time there have been decided improvements in the quality of the supply in every city. Some newly appointed inspector has been able to instill a wholesome fear into the heart of the milk dealer, but when his successor takes up the work a little less efficiently, the original conditions again obtain. The improvement is never permanent. We shall always have to chase the cart of the milkman up alleys in early morning to get samples for the Babcock test for fat and the sulphuric acid test for formaldehyde, and we shall always find some man who is willing to run the gauntlet of inspectors in order to make a ten-gallon supply of milk meet the demands of a twelve-gallon route.

But after all the real test of the quality of milk is not its per cent of fat or solids, casein or sugar. A little water reduces its food value, the removal of its cream makes the oatmeal and coffee less palatable, but aside from the petty thievery of the milkman that robs the pocketbook of the consumer, no definite harm has been done him. The real danger in the milk supply is in *the dirt in the bottom of the bottle*; the actual injury to the infant is caused by the bacteria which careless handling has allowed to reach the milk and breed countless millions of their kind. The pure milk problem is a sanitary, not a chemical one. Effective inspection must begin at the dairy farm, not at the tail of the delivery wagon. And how can any city of over fifty thousand population hope to go to the dairy to determine whether or not the cows have been tested and found free from tuberculosis, to observe the care of the cows, the ability of the milkers to draw the milk without at the same time loading it with filth, the purity of the water used in washing utensils, the conveniences for this most important operation and the thoroughness with which it is done, the temperature to which the milk is cooled as soon as it is brought from the dairy to the milk room, the care with which it is held below the point at which bacterial growth takes place, the length of time it is in transit between the farm and the kitchen door, the health of all the men through whose hands it passes, the scores of opportunities for the supply to be changed, until, as the unknown author of "Death in the Pot" said of the bread sold in London a hundred years ago, "it is no longer the staff of life, but a crutch to help us onward to the grave." At different times attempts have been made by various cities to regulate the sanitary character of milk by making bacterial counts, but so far as I know none of these well designed methods of work have been effective. The reason is plain. In the first place, it is a stupendous task to take the bacterial count of every can of milk, it is utterly impossible to examine individual bottles; even if it were possible, the most skilful worker cannot



make a satisfactory count of the bacteria in a given sample in less than several hours. It is out of the question to hold up the delivery while the test is being made. Moreover, the bacterial count does not tell the real story of the dairy. The most unsanitary dairy will produce milk that will give a low bacterial count if it is held at a temperature below 50 degrees F. until it is delivered, while the milk from the finest herd, produced in a model dairy, will show a count high enough to warrant its condemnation, if it has been allowed to reach a temperature at which growth proceeds.

Am I overstating when I say that there has been a feeling on the part of the producer that the public will not pay a better price for a clean milk than it will pay for dirty and unwholesome milk? This has no doubt been true. The price of flour has varied with its breadmaking qualities; the cost of meat depended on the cut; the character of fruit fixes its market value; but the price of milk is arbitrarily set by custom and is dependent on no standard of composition, excellency or purity. Milk is milk, and whether it is produced in accordance with the best principles of dairy practice or drawn from poorly nourished, diseased cows, stabled in filthy barns, the customer has cared little so long as he gets cream for his coffee and a white fluid for his children. This lack of concern on the part of the consumer has made it possible for the dairyman with slovenly habits and a poor equipment to compete with the man who is trying to produce a high grade milk, and as a result the price of milk has been fixed close to the cost of production under the most unsanitary conditions.

We can hardly hold the municipalities responsible for the consumer's lack of appreciation of the fact that clean milk is worth what it costs. But until milk is bought on that basis the efforts of the milk inspector must be largely punitive. The health authorities can only control the milk supply by denying the dirty dairy a market and by punishing the man who sells dirty milk. The experience of a thousand cities finds little real

progress in such methods of control. Each year I am becoming the more convinced that the ultimate settlement of the question must come from within rather than from without, that is, that the problem of a pure milk supply rests with the dairyman rather than with the inspector. Like morality, clean milk will come not as a result of legislation, or of state or municipal control, but of education.

### DISCUSSION.

QUESTION. I should like to ask Dr. Barnard if he has tried to make the municipal laws throughout Indiana uniform.

DR. BARNARD. At least seven years ago the State Board of Health drafted what it felt was a reasonable ordinance. We have tried to secure the passage of that ordinance by various city councils throughout the state. We have been successful in hardly a single instance. All of you inspectors know that some local attorney, official or organization writes the city ordinances, and in our experience it is almost impossible to persuade the authors of those ordinances to act wisely. The ordinances in force throughout our state vary widely even from the state law. There are ordinances, for instance, which require a higher butter-fat content in some cities than the state law requires, and those officials are endeavoring to enforce an ordinance that is clearly unconstitutional, and in a way are succeeding in doing it. We have not found it possible to secure uniform dairy ordinances through our state, and I don't believe it will be possible to do so for a long time to come. I may say, gentlemen, that six of the milk and dairy inspectors of our department are here at this convention. (Applause.) They came up here because for years we have felt that by far the greatest problem before us in our food control work is the milk problem. Food adulteration, as we used to know it, does not exist with us any longer, but we are not making such headway with the milk problem. We have closed hundreds and

thousands of dairies in Indiana in the past few years, and have been instrumental in building up a large number of model dairies in their place, and yet, in the aggregate, dairy conditions are not very much better down there in the state where they ought to be the best than they were before food laws were enacted. The problem is one, I will not say unsurmountable, but I confess we have not found the way yet, and that is why we are up here, and the reason I made a good many statements in my paper you probably would not accept, although you have been kind enough not to say so.

If there is any way by which a pure milk supply can be provided for a city of fifty thousand people, I should like to know it. Dr. Goler, of Rochester, some years ago, set for his department a very high standard, and we were told by them they had a perfect milk supply in Rochester, but the doctor told me two years ago that he was in utter despair, that he had given up, that his ten years' work seemingly had amounted to but little, and I felt it left the rest of us in pretty hard lines, because we had looked forward to his work as having set standards which the rest of us might follow successfully. If any inspector here has been able to secure for his city a well regulated milk supply, without destroying the dairy industry around there, I want him to tell us how he did it.

QUESTION. I would like to ask Commissioner Barnard if in Indiana they utilize pasteurization to safeguard the public health.

DR. BARNARD. We are putting in pasteurizing plants all the while. Nearly every city in the state is pasteurizing part, and most of them a large part, of their supply. I am convinced that pasteurization is a saving process, especially in so far as the baby is concerned, but no one can convince me that good milk can be secured by allowing a man to operate a dirty dairy and then attempt to take out the dirt or kill bacteria by pasteurization. It is in no way a solution of the clean milk problem.

QUESTION. Have you ever tried grading milk?

DR. BARNARD. Not yet. Dr. Hurty was a member of that committee which looked into that matter. We will watch New York awhile before we attempt to make use of it. We did make use of a system of grading in the small city of Crawfordsville four or five years ago, but that did not work out well in that small community, largely because the dairymen refused to accept any dictum except of their own making, and in our state, at least, where the dairyman can raise corn and hogs easier than milk, it is going to be a very difficult thing to grade milk for him.

QUESTION. I understood the Doctor to say education was the solution of this problem. I want to ask Dr. Barnard if he has any ideas as to what departments can best carry on this work and the manner in which it can best be carried on.

DR. BARNARD. I have some very definite ideas, Mr. President. Our state and your states maintain a highly paid, very efficient organization for the purpose of promoting the dairy industry. Our state and your state run special dairy trains around the state, for the purpose of telling farmers how to produce milk. I have never yet run across a professor at a university or on a dairy special who had much to say about milk production, except how to increase the supply. If some of the professors of dairying would at the same time teach the farmer how to produce clean milk, we would have a basis on which to start. At present the work of milk production and milk control is carried on by a class of men who are trying to increase production, and who, as they admit themselves, dare not say a word about sanitary dairying. Therefore, the average teacher of the dairyman is giving almost all his attention to increasing the supply, to encouraging people to go into the dairy business without, at the same time, telling them how to produce clean milk and milk that will meet the requirements of the state and city milk laws. The same people who are attempting to build up the dairy industry by increasing the supply ought to be help-

ing to build up a dairy industry that will produce milk fit for the market.

QUESTION. I would like to ask Dr. Barnard if he considers it better to educate the public or the producer.

DR. BARNARD. I do not consider it is possible to secure an adequate supply of milk unless we are willing to pay the price, and it is vitally necessary that the consumer should be brought to understand that pure milk is worth all it costs, and that we are trying in our department to do. That I assume to be a part of the work of the milk inspectors. We must not ask a dairyman to produce milk for our table at a loss.

QUESTION. I would like to ask if it would simplify matters in any way to place the municipal milk control in the hands of the state department.

DR. BARNARD. I don't believe so, and I should not want to be responsible for the quarrels of milk inspectors in a hundred cities. The conditions would be such that it would be practically impossible to secure any reasonably good results in those communities. As I said at the outset, I believe that the control of the milk supply is to be largely handled by local officials.

PROF. HARDING. One of my colleagues has suggested that a word ought to be said on behalf of the dairy departments. I think Mark Twain said that some day when he had time he was going to get out a book in defense of the devil, that any power which is responsible for three-fourths of the government and all of the politics had things to be said in its favor. Now, I really do think there are some things to be said in justification of our dairy departments. They have not done all they ought, but I submit that that same indictment can be brought against many of us. They have had difficulties to meet.

Unfortunately, the representatives of the public health interests in this question have not taken as broad a view of this situation as our friend who has just addressed us. They have undertaken to establish the conditions under which milk must be produced, how many times a day the stable must be cleaned

out, and under what conditions the various items of transportation, etc., should be done, and have established how many bacteria are permitted to appear in the milk. In fact, they have undertaken to regulate the details of the dairyman's business to a large extent.

Now, every head of the dairy department knows that if the dairymen are to take seriously these laws which have been and are being laid down by our health departments, there will be no milk produced. Put yourselves in our place. We cannot go on the dairy special, or in any public way point out to our constituents, and they can go ahead and do as they please about it. It is not a position we wish to be crowded into, and on the other hand, as intelligent members of society, we cannot go ahead and advise them to do the impossible, and a good many times I suspect we have done the discreet thing by keeping out of that situation, hoping that ultimately there would be enough moderation and good judgment injected into the situation so that we could take hold and push with the people working for better things, those who uphold progress. As a matter of fact, I wish for the dairy producer to say that so far as my knowledge of at least two states of the Union are concerned, the dairymen do not need very much education to produce the highest grade milk. They are prepared to produce higher grade milk than the market is willing to take and pay for. In New York the dairymen have for a number of years been prepared to furnish two quarts of certified milk to every quart the consumers will pay for. It is clear to me it is not the fault of the dairyman. Feeble and crude and unsatisfactory as is the classification scheme used in New York City, and recently proposed for the State of New York, imperfect as it is in many particulars, I do believe it is the beginning step toward better things. As soon as there is a well defined market opening where a dairyman can find an outlet for good milk at a price which will justify its production, the milk will be forthcoming. I think the inspection service can hasten that day very much by bring-

ing the attention of the consumer toward what he really wants in the way of milk, so that everybody can understand what is actually wanted in the way of a product, and not spend so much time in trying to tell the dairy producer how to run the details of his own business. If you will tell him what kind of product you want, in terms he can understand, he will find a way to deliver that product on the market.

One very important thing in trying to tell the dairyman how to produce his goods is to realize when you get beyond the line of natural ice. The details have been built up in northern regions. As soon as you get toward St. Louis and south, where natural ice is unknown, and conditions are different, those standards worked out by New York City become difficult, so that the dairyman there finds it impossible to deliver milk and deliver it at 50 degrees, and do a lot of things considered orthodox in the northern cities and the land of ice.

PROF. FRANDSEN. As a representative of the Dairy Instructors' Association, I think, perhaps, I should add a word to the discussion. I am reminded of the story of the man who had been taking in a big quantity of fire water. He spoke and said: "I can lick anybody in the township." No one made any objection, and he said, "I can lick anybody in this county." There was no objection to this statement, and he continued, "I can lick anybody in this state." Somebody stepped up and took off his coat and did him up. The fellow got up and brushed himself off a little, and said, "The mistake I made was in taking in too much territory."

I am just a little bit inclined to think, while I agree with the general tendency of the paper, that the paper was too sweeping, that the dairy cars are not going along all the time. I don't know of a single dairy instructor who is not interested in this sanitary dairy work. One reason we have not emphasized it more is that we must have a supply first. I think you will agree with me that if you had in your town an ample supply, it would be easier to improve the quality. The experience

of almost every inspector has been that when he has drawn the line on the poorer grades of milk there has been a scarcity of milk and the prices have been sent up. If the supply had been bigger this would not have been the case.

I think the trouble is largely with the consumer. It is certainly discouraging to the producer of good milk that the man who takes no care of his milk sells it for the same price. The apparently intelligent consumer pays no attention whatever to this enormous difference in the quality of milk. I think if our inspectors would educate the consumers so that they would know exactly what they want and realize the danger of inferior milk, that the matter of getting the producer in a position to produce the kind of milk they want would be comparatively easy.

*“The question which is forcing itself more and more on the minds of scientific men is not how many diseases are, but how few are not the consequences of men’s ignorance, barbarism, folly, self-indulgence.”—Charles Kingsley.*



## THE WORK OF THE PURE FOOD DEPARTMENT OF TAMPA, FLA.

R. I. GORDON, *Chief.*

I realize there is a vast difference in the milk supply of a southern city of sixty thousand inhabitants, and that of a large northern city.

I became the head of what is called the Pure Food Department three years ago. At that time milk and dairy inspection in Tampa amounted to nothing. The department is controlled by the mayor, city council and city health officer, and they, I am proud to say, realize the importance of a pure and wholesome milk and have always been ready and willing to back me up on any proposition that will improve the quality of milk.

Nature has given Tampa a big asset, that of having the best climate on earth, where flowers are in bloom every month of the year, and the temperature very seldom gets below 40 degrees F., and then only for a few days in winter. This allows the construction of the open dairy barns, which practically solves the pure air question.

All the dairies that supply Tampa with milk are located within a radius of fifteen miles of the city. Milk is delivered to the consumer twice a day, and within four hours from the time of milking.

My first investigation showed that Tampa, like other cities, has at least three types of dairymen, one that invites practical inspection and is willing to do anything to improve the quality of his products; another class represented by the man who has been in the business for the past twenty-five years and thinks what he doesn't know about milk production is not worth knowing (I have had more trouble with this class than any other); and a third class composed of those who don't know the first principle of sanitation and who think if they are asked to improve an unsatisfactory condition they are being

persecuted and their rights as American citizens are being jeopardized.

The courts have always been our *last* resource. Tampa has a municipal judge who believes a pure food ordinance should not be violated, and as he fines the offenders accordingly, naturally no ones cares to appear before him the second time for the same offense.

The City of Tampa consumes 5,500 gallons of milk and cream daily, which is distributed by 76 dairymen direct from the farm, and one distributing plant which is operated in the city. All have to make an application and secure a license to sell their products, and this gives the department a check on every dairyman.

#### MILK ANALYSIS.

The minimum legal limit for all milk sold in the City of Tampa fixed by ordinance is as follows: Milk must contain at least 3.25 per cent butter-fat, and not more than 87½ per cent of water, having an average specific gravity of 1.030. The legal bacteriological limit of milk sold in the city requires that it shall not contain over 500,000 bacteria of all kinds to the c. c. This department has made no prosecutions under this law, but has, through a system of education, reduced the bacteria count, which was in the year 1912 as high as 27,000,000 bacteria per c. c., down to a point where all milk sold contains less than the number permitted by the ordinance.

This department has worked very hard in trying to eradicate tuberculosis from the herds that supply Tampa with milk, and we think that we are meeting with success. In 1912 it was found that 60 per cent of the cows that furnished Tampa with milk were suffering with tuberculosis. In 1913 we found that we had reduced it to 25 per cent. This year, 1914, we found only 7 per cent. Our ordinance is as follows: A dairyman, in order to sell his products in the City of Tampa, must sign an

agreement that if, after testing his herd, it is found that an animal shows a typical reaction to the test, he will allow me to brand said animal with the letters T. B. on both hips, the letters standing for tuberculosis bacilli. Of course the public knows what the letters mean, and the result is that the animals are slaughtered. The city also agrees to pay \$40.00 per head for every mistake the department makes. As the city has not paid out money on this account, it shows how accurate the test has been. Up to the present time the dairymen have had to pay a charge of \$3.00 for testing the first cow, and 25 cents for each additional cow. This year, however, I will try to have the city bear that expense.

#### FARM INSPECTION.

I believe it is very necessary to have a strict farm inspection. The success that this department has had in raising the standard of the milk sold in the City of Tampa has resulted from the diplomacy used in the work. Inspectors try not to antagonize the dairymen, but rather to gain their friendship. As a result of such a policy, even the most ignorant, after having seen the benefits of modern ways and methods, soon fall in line.

#### THE DAIRY FARM SCORE CARD.

The dairy farm score card has been a great help to us in improving the quality of milk sold. In 1912 the average score of all dairies selling milk in Tampa was 27. They had practically nothing to score. In September of this year, 1914, the average score was 72. So you see we are progressing.

#### TEMPERATURE.

Our ordinance reads that no milk shall be sold in the City of Tampa that is above a temperature of 65 degrees F. In try-

ing to enforce this section of the ordinance, the department met with opposition. The dairymen claimed it would work a hardship on them if compelled to ice the milk on the wagon. They were arrested, and having good legal advice, the matter was finally adjusted out of court on the basis of their agreeing to comply with the ordinance.

#### PUBLICITY.

During the past year this department has done a great deal of publicity work in cooperation with the women's clubs. I am of the opinion that the ladies can do a great amount of good along the line of education, especially as regards the use of milk and its proper care in the home.

The department commenced three years ago with no funds whatever for its use. Last year the city set aside \$7,500 for expenses, and this year they have been a little more liberal and have appropriated \$10,000 for the work. As a result of these appropriations, conditions are rapidly improving, and I hope the day will not be far distant when I can boast of the milk supply of Tampa, Florida, as well as of her Havana cigar industry.

*“The proper feeding of our metropolitan centers, with their increasing demands and exactions of palate and purse, taxes the ingenuity of the farmer, the transportation agent, the middleman, and the retail distributor. The milk question is part of this great problem.”—Rosenau.*

REPORT OF COMMITTEE ON LEGISLATION AND  
LEGAL LIMITS FOR THE CONTROL  
OF MILK AND CREAM.

A. N. HENDERSON, *Chief Inspector*, Seattle, Chairman.

Our President, in appointing a committee on legislation and legal limits for the control of milk and cream, instructed us

First. To gather facts relative to the control of state and municipal milk supplies.

Second. To report on what is being done in a legal way by those cities which are most successfully solving the pure milk problem.

Third. If the information secured warrants, to make suggestions for legal limits for composition and bacterial content for milk and cream which can be used as a guide or standard for municipal milk legislation.

Owing to the lack of time and available data and to the confusion arising in segregating the repealed and present laws, this committee deemed it advisable to eliminate from this report all reference to state enactments and asks for a continuance to report at some future time on state legislation relative to milk control.

Health departments of 51 cities having a population of 100,000 or more were asked to submit their ordinances, rules and regulations governing the milk supply, the birth rate for the city, and the number of employees in milk inspection service. Thirty-two cities responded with ordinances, but only a few gave the birth rate and number of employees in the milk division; the number reported was so small that it was thought not advisable to consider same in this report.

In studying the 32 ordinances submitted, the following was especially noted:

First. The general composition of the ordinance.

Second. Chemical standards.

Third. Temperature standards.

Fourth. Bacteriological standards.

Fifth. Standards of pasteurization with reference to the time, temperature and sale.

Sixth. Bovine tubercular control.

Seventh. Standards of sanitation, including methods and equipment of the dairies.

In general composition the ordinances were divided into two classes. Twelve ordinances were distinctly verbose, and although being worded to meet legal requirements and rules of evidence, the ordinances are vague as to meaning and inadequate as to standards, and do not agree with our present knowledge of milk sanitation. The remaining ordinances were explicit, concise and easily interpreted without legal assistance. The standards, while not completely covered in all ordinances, are in accord with our present knowledge of sanitary milk control.

All 32 ordinances require that milk shall be sold under permit or license. In 24 cities, or 75 per cent of them, annual milk permits are required. Eight cities, or 25 per cent, stipulate that permits shall remain in force until revoked.

Twenty-one cities, or 65 per cent, make no charge for permits; 11 cities, or 35 per cent, require the payment of an annual fee. The fees range from \$5 to \$1 per wagon per year.

Seven cities, or 22 per cent, classify milk, the general scheme of classification being that recommended by the National Milk Committee.

### *Chemical Standards.*

A butter-fat standard is fixed by ordinance in all those cities which submitted ordinances to this committee, the standard varying considerably in different parts of the country.

In 2 cities, the butter-fat standard is 3.60 per cent.

In 6 cities, the butter-fat standard is 3.50 per cent.

In 7 cities, the butter-fat standard is 3.25 per cent.

In 3 cities, the butter-fat standard is 3.20 per cent.

In 13 cities, the butter-fat standard is 3.00 per cent.

In 1 city, the butter-fat standard is 2.50 per cent.

All ordinances submitted require total solids standards, as follows:

In 1 city, the total solids standard is 13.00 per cent.

In 4 cities, the total solids standard is 12.50 per cent.

In 22 cities, the total solids standard is 12.00 per cent.

In 1 city, the total solids standard is 11.70 per cent.

In 4 cities, the total solids standard is 11.50 per cent.

Twenty cities, or 62 per cent of the cities submitting ordinances, have a solid, not fat, standard:

In 2 cities, the solids, not fat, standard is 9.50 per cent.

In 5 cities, the solids, not fat, standard is 9.00 per cent.

In 3 cities, the solids, not fat, standard is 8.75 per cent.

In 9 cities, the solids, not fat, standard is 8.50 per cent.

In 1 city, the solids, not fat, standard is 8.40 per cent.

A butter-fat standard for cream is required in 26, or 81 per cent, of the cities, as follows:

3 cities require cream to contain 20 per cent butter-fat.

16 cities require cream to contain 18 per cent butter-fat.

6 cities require cream to contain 16 per cent butter-fat.

1 city requires cream to contain 15 per cent butter-fat.

Skimmed milk must contain a certain per cent of solids, not fat, in 17 cities, or 53 per cent of those submitting ordinances, the standard varying as follows:

In 1 city, 10.50 per cent solids, not butter-fat, is required.

In 1 city, 9.50 per cent solids, not butter-fat, is required.

In 6 cities, 9.30 per cent solids, not butter-fat, is required.

In 1 city, 9.00 per cent solids, not butter-fat, is required.

In 1 city, 8.80 per cent solids, not butter-fat, is required.

In 3 cities, 8.75 per cent solids, not butter-fat, is required.

In 3 cities, 8.50 per cent solids, not butter-fat, is required.

In 1 city, 8.00 per cent solids, not butter-fat, is required.

Four cities, or 12 per cent, regulate the sale of buttermilk, one requiring 8.50 per cent of solids, three 8.00 per cent of solids.

### *Temperature.*

Twenty-eight cities, or 90 per cent of those which submitted ordinances, require a minimum temperature standard, as follows:

2 cities require a minimum of 70 degrees F.

3 cities require a minimum of 65 degrees F.

2 cities require a minimum of 60 degrees F.

5 cities require a minimum of 55 degrees F.

15 cities require a minimum of 50 degrees F.

1 city requires a minimum of 45 degrees F.

Eighteen of the above cities require that milk shall be stored and delivered in the country at the same temperature as is required in the city, while 10 cities provide for a different temperature for milk stored or delivered in the country.

2 cities require a temperature of 70 degrees F.

6 cities require a temperature of 60 degrees F.

2 cities require a temperature of 50 degrees F.

### *Bacterial Standard.*

The bacterial standard is specified by ordinance in 20 cities, or 62 per cent of those reporting. These standards vary greatly, as will be noted below:

1 city, one million per c. c.

10 cities, five hundred thousand per c. c.

1 city, four hundred thousand per c. c.

2 cities, two hundred and fifty thousand per c. c.

3 cities, two hundred thousand per c. c.

3 cities, one hundred thousand per c. c.



A separate standard in 6, or 19 per cent, of these cities is specified for pasteurized milk, one city specifying one hundred thousand, and five fifty thousand per c. c.

Of those ordinances examined, 12, or 37 per cent, require that all milk sold in the city shall be produced by animals free from tuberculosis, while 4, or 12 per cent, of the cities require by ordinance that milk sold shall be produced from animals free from tuberculosis, or the milk shall be pasteurized in accordance with certain regulations.

#### *Pasteurization.*

Eleven cities, or 33 per cent, are regulating pasteurization by requiring certain degrees of temperature to which milk must be subjected and specifying the length of time and the degree of heat to be maintained. The period of heating in all but two ordinances is based upon a sliding scale of degrees of heat applied and length of heating period, this scale ranging from 160 degrees F. and two minutes exposure to 145 degrees F. and 30 minutes exposure. In the other two ordinances an exact temperature and period of heating is required, one city requiring 145 degrees for 20 minutes, the other 145 degrees for 30 minutes.

Six cities, or 19 per cent, require all pasteurizing apparatus to have attached a recording thermometer. Five cities, or 15 per cent, require that pasteurized milk shall be delivered to the consumer within a specified time, one city allowing 36 hours, and four 24 hours within which to deliver. Eleven, or 33 per cent, of the ordinances examined require all pasteurized milk to be labeled. Six cities, or 19 per cent, prohibit repasteurization. One city requires that milk shall be put through a clarification process before pasteurization.

#### *Sanitation.*

Six cities specify a minimum score which a farm may receive and be allowed to dispose of milk, one city requiring a 65 per

cent score, three 60 per cent, one 50 per cent, one 40 per cent. Three of the cities are using the score card adopted by the United States Dairy Division, and 3 are using score cards presumably arranged in part by their respective departments. Four cities, or 12 per cent of the cities submitting ordinances, specify the lowest score a milk plant shall receive; three specify 70 per cent as a minimum, and one 60 per cent.

Seven cities, or 21 per cent, require sediment tests, and state in the ordinance the amount of sediment allowed upon a specific cotton disk. Seventeen cities, or 53 per cent of those examined, prohibit the sale of dipped milk.

The methods followed in securing data and information relative to what is being done in a legal way by those cities which are successfully solving the milk problem, were as follows:

The committee assumed that diarrheal diseases of infants are generally accepted to be due to impure food, and as, during the first year of the life of a child, it normally consumes 500 quarts of milk and practically no other food, we believe that milk influences to a very large degree a city's death rate from diarrhea and enteritis under two years of age. Working on this basis, statistics of the United States Bureau of Vital Statistics were compiled showing the death rate per 100,000 population due to diarrhea and enteritis under two years for the 32 cities which submitted ordinances. Data for the years 1910, 1911 and 1912 only were available, therefore only a three-year comparison is made, showing the percentage of increase or decrease in the death rate from diarrhea and enteritis. The committee does not intend to make a comparison in this report between the death rates of the different cities but simply to show the death rate for these three years of each city, believing that if the birth rate is constantly increasing with the population, and the climatic conditions remain practically the same, any decrease in the death rate from diarrhea and enteritis is largely the result of the activities of dairy and milk inspection.

The statistics show that, for 1911, 24 cities, or 75 per cent of the cities submitting ordinances and for which statistics were compiled, decreased their death rate from diarrhea and enteritis among children under two years of age 22 per cent over the year 1910. One city remained the same. Seven had an average increase of 16 per cent.

6 cities had a decrease from 1 to 10 per cent.

5 cities had a decrease from 10 to 20 per cent.

7 cities had a decrease from 20 to 30 per cent.

5 cities had a decrease from 30 to 40 per cent.

1 city had a decrease from 40 to 50 per cent.

4 cities increased from 1 to 10 per cent.

1 city increased from 20 to 30 per cent.

2 cities increased from 30 to 40 per cent.

The year 1912 shows that 31 cities, or 97 per cent of those above referred to, and for which statistics were compiled, showed an average decrease in the death rate from diarrhea and enteritis among children under two years of age of 28 per cent over the year 1910. One city in that year only showed an increase, which was 19 per cent. The decrease among the cities showed:

In 6 cities a decrease of from 1 to 10 per cent.

In 6 cities a decrease of from 10 to 20 per cent.

In 4 cities a decrease of from 20 to 30 per cent.

In 4 cities a decrease of from 30 to 40 per cent.

In 7 cities a decrease of from 40 to 50 per cent.

In 3 cities a decrease of from 50 to 60 per cent.

In 1 city a decrease of from 60 to 70 per cent.

Assuming that the laws and legal limitations governing the production, sale and distribution of milk form the basis upon which an efficient system of municipal milk control is developed, a classification of the 32 cities has been made. The first class or group contains those cities which have made a reduction of over 40 per cent in the last two years in the death rate from diarrhea and enteritis under two years, and the second

class or group contains those cities which have made a reduction of less than 40 per cent in the death rate. These two classes or groups have been established in order to compare the legal limits for milk quality in the two groups.

Eighty per cent of the ordinances in Group One are clear, explicit, and in conformity with advanced methods of dairy sanitation, while only 54 per cent of the ordinances classed in Group Two are of this kind.

Twenty per cent of the cities in Group One classify their milk supply, while 31 per cent of the cities in group two are following a classification plan.

The prevailing fat standard in Group One is 3.25 per cent; in Group Two, the standard is 3 per cent. In Group One, the solids, not fat, standard is equally divided, two cities having a standard of 9 per cent solids, two cities 8.75 per cent, and two cities 8.50 per cent, while the prevailing standard in Group Two is 8.50 per cent. In both groups the prevailing total solid standard is 12 per cent. In both groups the prevailing butter-fat standard is 18 per cent for cream, and the standards for solids in skimmed milk and buttermilk are the same, the former 9.30 per cent and the latter 8 per cent. The prevailing temperature standard in both groups is 50 degrees.

Eighty per cent of the cities in Group One have a bacterial standard for raw milk, while 50 per cent in Group Two have such a standard, the prevailing standard in Group One being 200,000, and in group two 500,000. Forty per cent of the cities in Group One have a bacterial standard for pasteurized milk, and 18 per cent in Group Two, the prevailing standard in both being 50,000 per c. c.

Sixty per cent of the cities in Group One require the tuberculin testing of cows supplying milk, or that the milk shall either come from tuberculin tested animals or shall be pasteurized. Forty-five per cent of the cities in Group Two also have such requirement. Fifty per cent of the cities in Group One control pasteurization by ordinance, while only 25 per cent

of the cities in Group Two do so. Thirty per cent of the cities in Group One require milk to be delivered within a specified time, 4 per cent of the cities in Group Two have this requirement, the prevailing time limit in Group One being 24 hours. Thirty per cent of the cities in Group One prohibit repasteurization, 9 per cent in Group Two prohibit it.

Forty per cent of the cities in Group One have a minimum score below which no dairy may sell milk, 18 per cent of Group Two have established such a standard.

Eighty per cent of the cities in Group One prohibit the sale of dipped milk; 34 per cent in Group Two.

We suggest that the Committee on Legislation and Legal Limits for the Control of Milk and Cream be continued, to enable it to make further study relative to temperature, bacteriological and pasteurizing standards, that a more systematic study can be made regarding necessary requirements for methods of and equipment for milk production and distribution. We suggest that every member of this Association assist in gathering further data which may be desired, so that a permanent record may be made, which we believe would be valuable for reference purposes. This record shall contain ordinances under which milk inspection is carried on, number of employees and compensation of employees, population of districts inspected, birth rate and death rate, etc. We believe such data should be compiled for each municipality represented in this Association.

#### DISCUSSION.

MR. ERNEST KELLY. It is a fact that one of the greatest drawbacks in dairy inspection now throughout this country is lack of uniformity, both in standards and methods of enforcing the standards. The variation in the fat standards and in the bacterial standards, especially, as you have heard from Mr. Henderson's paper, is extreme, and that is continually

creating chaotic conditions among the dealers and producers interested. It is strange to me that milk containing  $3\frac{1}{4}$  per cent fat is wholesome in one community and not in another, that a million bacteria per cubic centimeter is pernicious in one part of the country and healthful in another, and yet a perusal of various ordinances would of necessity lead one to such a conclusion. I believe there is needed some uniform, equitable method of grading milk, whereby it can be sold on its merits. It seems to me that is one of the most needed things in the dairy business to-day, needed for the protection of the producer and for the benefit of the consumer, and I hope some time such a system may be developed. Then a person living in San Francisco buying Grade A milk can move to New York and buy Grade A milk and get the same quality as in San Francisco. I believe such a thing is possible, and in time will come about.

*“As the child is the most helpless thing in the world, it is the thing that most needs the consideration of others.”—Bryan.*

## SOME STATISTICS REGARDING INFANT MORTALITY.

DR. WM. H. PRICE, *Health Officer*, Detroit.

I perhaps owe the Association an apology for taking up the subject of statistics and infant mortality. Yet I have a particular object in doing so, and the reason is this: I have stood on several occasions over in the National Dairy Show and have heard men name the number of babies who die less than one year old, and make the assertion to the milk dealers that so many tens of thousands or twenties of thousands and hundreds of thousands of babies die annually as the result of impure milk. It is almost a direct charge that these milk dealers, the majority of whom we consider sincere and honest business men in our home towns, are guilty of homicide. We must all agree, and we know, that the quality of the milk supply is very intimately associated with the health of the people and especially of the children, but I don't think it necessary to give a false value to that. I don't think it necessary, in order to justify our work as dairy inspectors, to make extravagant statements, and should we resort to such means to secure funds for our work, I think there will be a come-back somewhere, and finally it will be very hard to get such an idea out of the people's minds when we desire to do so.

In the absence of an annual census to determine the population under one year of age, there is only one way by which the rate of infant mortality can be determined, and that is by dividing the number of deaths under one year of age by the actual number of births. There will be some discrepancies under this method, due to people moving in or moving out of a city, but it is the most accurate method available. The nearest accurate figure that can be given of the baby population in a large city is the number of births, and we know that report of births is required in very few states, and in practically no cities

are births completely reported. In the absence of ability to arrive at mortality rates by this accurate means, a number of places have resorted to the practice of "estimating" the number of births. Such a practice should be condemned, for it can be no more accurate than "estimating" the number of deaths or "estimating" the death rate without reference to either factor, that is, the actual number of births and the number of deaths.

So, also, for the same reason, a number of places have resorted to the system of comparing the deaths under one year with the total deaths. That would be all right if in different localities the population were equally divided among the various age groups, but when we come to analyze the situation, we find that that equal distribution does not exist. For example, the city of Washington has a birth rate of 20 to the 1,000 population, and births are practically completely reported there. New York has a birth rate of 25 per 1,000 population. The city of Detroit has a birth rate of 33.7 reported for every 1,000 of population, and the reports are incomplete. This is out of all proportion to any other city of which I know, and is doubtless due to the commercial and industrial prosperity which has prevailed, and which has brought a large number of the younger people of child-bearing age to our city. If, then, we would compare our infant deaths as compared with our total deaths, as against the corresponding Washington figures, a leeway of more than 68 per cent should be given to Detroit, and this should be increased by other factors. While birth rates vary in different places, as they do, such a system of trying to arrive at definite results is apparently impossible, and the attempt to do so is detrimental. If we want to compare rates on an accurate basis, we should get our births reported.

The infant mortality problem is large in Detroit, both because of the large number in proportion to the population, and because each succeeding year brings a still greater crop. It is difficult to make any impression upon so great a number. Our



efforts in the past have been directed along the lines usually followed. but this year it was determined that these efforts should be more intensive and results tabulated.

In order to reduce an infant mortality rate, as determined by dividing the number of deaths by the number of births, two things must be done. In the first place, we must secure complete reports of births, and then we must reduce the number of deaths. If the city has an infant mortality rate of 200 per 1,000 births, when only half of the births are reported, that city would have a death rate of 100 per 1,000 births if all the births are reported. So, in order to make our statistics accurate, it is necessary to have a complete record of births, and that also is necessary for sanitary, legal and social reasons. I am assuming, of course, that all deaths are reported.

A feeling has prevailed among those interested that births were not fully reported in Detroit, but it is difficult to secure complete reporting of births without knowing definitely how great the error is, and on whom the fault rests. An effort has been made to secure this information. Two large lying-in hospitals were used for the purpose. Both were instructed to report monthly their number of confinements. A record was also kept at our office of every certificate giving one of these hospitals as the place of birth. The hospitals did not know that we were doing this. At the end of June one hospital had reported 396 confinements, while we had only 285 certificates; 111 were missing. The other hospital had reported 266 confinements, and 172 certificates were on file; 94 were missing. Taken together, 662 confinements had occurred, 457 birth certificates were on record, 205 were missing. By searching our records and also those of the Secretary of State at Lansing, 87 of the missing certificates were found, registering the births as having taken place at the parent's home or elsewhere than at the hospital, leaving 118, or 18 per cent of the total births which had never been reported at all. Assuming that this proportion of failures prevails in the city at large, the official in-

fant mortality rate as given out for Detroit is and has been 18 per cent, or 21 points, higher than it should be.

But there is reason to believe that the failure of reports is greater than 18 per cent. It was found in checking over the returns, as I have stated them, that the staff or "house" cases were uniformly reported, and that these were in the great majority. The failures occurred among the cases attended by private physicians, indicating that physicians generally are remiss in failing to report a greater percentage of their cases than I have stated.

Thus we have the names of upwards of 100 physicians in Detroit, most of them prominent, many of them my very good friends, some of them employees of the Board of Health, who have not been reporting births. It is rather embarrassing to know what to do with this list now that we have it. The law provides that each of these physicians be prosecuted. Perhaps we may find a way to accomplish the result without resorting to this. It is too late for these findings to alter our rates for this year. It should do so hereafter.

But a more important work is to reduce the number of deaths, and in this connection, mention should be made that the number of deaths is, in some measure, an index of morbidity. And this is important, for if a child does not have a proper start in life, if he suffers illness, even though he recover, he is injured and weakened, and he will not have an equal chance; and so, while we measure health by mortality, a more important factor is morbidity, and the most important, from the sanitarian's view, is the prevention of both.

At the beginning of the year we undertook to tabulate on the forms which I show you, the infant births and deaths which occurred in Detroit, and then the births and deaths were located geographically upon maps. Each square encloses six or eight city blocks, and we call each of these squares a district. There are 498 such districts. The system makes locating, by

means of a card file, very easy and quick, and is close enough for practical purposes.

The birth map for May has between 1,700 and 1,800 births indicated on it. One of these maps is available for each month of the year, and by adding the births on the various maps we may know the number of births which occurred in each district for any number of months. This other is the death map for January, February and March. It is possible to get the deaths for three months on one map. At the end, then, of six months we may make a display map and indicate on it at the lower left-hand corner of each district, the number of births for six months, and at the lower right-hand corner the number of deaths for six months, and strike a proportion between the two. Of course the proportions vary in different districts.

Those districts in which no deaths occurred were colored in blue. There is no need for the Health Department to expend its energy there. The ones in which the deaths were between 1 and 10 per cent are indicated in yellow. This is below the average rate in Detroit. The districts colored green had an infant mortality rate of between 10 and 20 per cent, and if there were not worse districts, special work would have been done there. But the districts in brown on the map had a mortality exceeding 20 per cent, and the district in red exceeded 40 per cent, that is, 40 deaths under one year to every 100 births. We were able to recognize at a glance the districts in which the necessity was the greatest, and in which we could work most advantageously, with greater results for the effort expended.

The work in the rest of the city was not neglected because of this district work. Fourteen of the school and infant mortality nurses were left at their regular work. But on July 1st, four others were assigned a brown district each. Each nurse was given a chart of her district, enlarged, so that it showed each street, alley, house, barn, and even outhouse and privy vault, contained therein. This chart indicated by red dots where

there was a baby under a year old, by black dots the houses where death had occurred. No milk stations or other baby saving agencies were in the immediate neighborhood of any of these districts, nor were any established. Each nurse was instructed to reduce mortality by reducing morbidity, and her reliance was to be her own ability to instruct and demonstrate hygienic care and feeding of babies.

These nurses started out then in the worst districts in Detroit, on July 1st, the worst season of the year. They worked from house to house, and the work is going on up to the present time. I have here tabulated and charted the results for the months of July, August and September.

In block 5-340, the mortality for the first 3 months of the year was 25 per cent of the births, and during the second 3 months it was 15.3 per cent. For the 6 months it was 21 per cent. During the third 3 months it was 15 per cent, a reduction of 6 points, or 33 per cent.

In block 11-440, the mortality for the first 3 months was 15.7 per cent, and during the second 3 months it was 27.6 per cent. For the 6 months it was 21.6 per cent. During the third 3 months, when a nurse was working there, it was 7.7 per cent, a reduction of 13.9 points, or 65 per cent.

In block 16-320, the mortality for the first 3 months was 17.6 per cent, the second 3 months 12.9 per cent, and for 6 months 15.2 per cent. During the third 3 months, it was 9.5 per cent, a reduction of 5.7 points, or 37 per cent. Block 16-320 was the only one of the four in which the mortality for the first 6 months was less than 20 per cent. This block was included because of the great number of deaths which were partly compensated for by an exceedingly high birth rate.

In block 16-400, the mortality for the first 3 months was 20.6 per cent, for the second 3 months, 50 per cent, for the 6 months, 31 per cent. During the third 3 months it was 5 per cent, a reduction of 26 points, or 84 per cent. In this district 14 babies died during the first 6 months, or  $2\frac{1}{3}$  for each

month. During the three hot months of July, August and September there were only 2 deaths, or 2-3 deaths per month.

In all these districts a baby dying in a hospital was charged against its residence district. Each nurse had supervision over from 100 to 150 babies. This cannot be said to be so intensive as to be impracticable.

Now when we take all these four districts together, there is quite an improvement in the figures. For the first 6 months in the year the mortality in all four districts, which involved almost 600 children, was 20.2 per cent, while for the 3 hot months, supposed to be the worst of the year, it was only 8.8 per cent.

But it may be imagined that Detroit was favored with a very fortunate summer, and that the general infant mortality was lower. Such was not the case, for the mortality of the rest of the city, outside these districts, was higher than for the first 6 months, and the mortality of these four districts, the worst of the city, was not only reduced 56 per cent from what it had been, but was reduced to 34 per cent less than in the rest of the city, and as I have said, the rest of the city, the better parts of the city, was not neglected, for fourteen nurses were working there.

It may be asked what these nurses found and what they did in these four blocks. The defects they found and attempted to correct were of the grossest kind. It will not be at all surprising to you to learn that they found the babies fed on beer and coffee and sausage, or anything handy. The milk bottle stood on the kitchen table, uncovered and dirty, and when the baby cried the milk was poured into the feeding bottle and given to the baby cold. This was especially true at night. In many cases no attempt was made at modification. When the mother did make an attempt to modify or prepare the food, she took no proper care of her hands before handling the milk, perhaps having just changed the diapers. The baby was left

bundled up, sometimes under a feather bed and perhaps beside the cook stove, or wherever it would be handiest, and the baby was improperly bathed. And then there were all those other defects of ignorance with which we are familiar.

I know some features of this work are familiar, but perhaps there are one or two things that are new. In our work the district was made the unit instead of a milk station. The milk station idea supposes that a mother has time or initiative to take her babies to the milk station, even while they are well, but frequently this idea is wrong. Mothers in the poorer quarters, with perhaps several other children, have neither time nor thought except for the immediate present. Some milk station statistics are made up only of those who come to their clinics, and we know that few babies are taken to a clinic until they are three or four weeks old, or older, and that 40 per cent of infant mortality occurs in the first month; and so the heaviest infant mortality is not included in their statistics. Our figures were made up from the regular reports, with this correction, however; all births in those districts were reported.

## DISTRICT 5-340.

Period	Births	Deaths	Ratio 3 mos.	Ratio 6 mos.	Ratio 9 mos.
Jan.-Mar . . . .	36	9	.25	....	....
Apr.-June ...	26	4	.153	.21	....
July-Sept ...	20	3	.15	....	.195

## DISTRICT 11-440.

Jan.-Mar . . . .	19	3	.157	....	....
Apr.-June ...	18	5	.276	.216	....
July-Sept ...	26	2	.077	....	.158

## DISTRICT 16-320.

Jan.-Mar . . . .	56	10	.178	....	....
Apr.-June ...	62	8	.129	.152	....
July-Sept ...	63	6	.095	....	.132

## DISTRICT 16-400.

Jan.-Mar . . . .	29	6	.206	....	....
Apr.-June ...	16	8	.50	.31	....
July-Sept ...	38	2	.05	....	.195

## SUMMARY OF FOUR DISTRICTS—5-340, 11-440, 16-320, 16-400.

Period	Births	Deaths	Ratio 3 mos.	Ratio 6 mos.	Ratio 9 mos.
Jan.-Mar . . . .	140	28	.20	....	....
Apr.-June ...	122	25	.205	.202	....
July-Sept ...	147	13	.088	....	.161

## REST OF THE CITY.

Jan.-Mar . . . .	4,527	615	.136	....	....
Apr.-June ...	4,526	468	.103	.119	....
July-Sept ...	4,840	649	.134	....	.125

And now we return to the original proposition. In no case was the milk supply, as it was delivered in any neighborhood, changed, with the exception that an earnest effort was made to eliminate the use of condensed milk. Of course we think that we have a pretty good general milk supply, and these results would not have been possible without a pretty good milk supply. And there is no question that we want a better one, for the public health and for decency, but I don't think we ought to go beyond the truth in arguing for that. I don't think it necessary to blame the milkman unduly for the ills that babies are heir to. I believe that the idea was well expressed by the words of a girl reporter who wrote up the situation in Detroit, when she said, "To successfully combine milk with a baby, you must take care of the baby as well as the milk."

## DISCUSSION.

MR. HENDERSON. My contention has always been that milk inspection does not cease when the milk reaches the home of the consumer. The inspector must not only work with the producer and the dealer, but also with the consumer. In one of our western cities, two ladies were appointed milk inspectors. They had their work outlined before they were appointed, and they went into this matter of feeding stations and the care of milk in the home in the districts of that city where it was needed. That city to-day has reduced its death rate for children under two years of age to a lower per cent than any city in the United States, and half the credit must be given to these two women milk inspectors who knew their place. They did not go out on the farms, but went into the homes and told the mothers how to do things, and they made a reduction of 78 per cent in three years of the death rate of children under two years of age.

DR. THOMPSON. I think the thanks of the Association are due Dr. Price for this paper. I cannot quote the authority for this statement, but I know the authority is good, that the question of infant mortality is 80 per cent education of the mothers and 20 per cent milk. There is a new work on infant feeding by Grulee, of Chicago. He says that the average doctor talks about percentage feeding of infants, and the fact is that there is not more than one in twenty that can explain to the housewife what percentage feeding is, or how to prepare and feed by percentage. One reason why proprietary foods are so popular with the mothers is the fact that the directions on the package are very specific and tell exactly how to fix it, and the doctor, as a rule, does not.

*"To successfully combine milk with a baby, you must take care of the baby as well as the milk."*



## DAIRY INVESTIGATION AND INSTRUCTION.

J. H. FRANDBSEN, *Professor of Dairy Husbandry*, University of Nebraska.

There are in the United States to-day sixty-seven agricultural colleges with funds and equipment worth \$127,729,000, and connected with these are, in round numbers, 4,000 people giving their time to agricultural educational work.

During 1912 it is estimated that instruction was given 300,000 students—this in addition to 6,000,000 reached by extension and farm institute work.

Agricultural experiment stations of our various states now employ about 2,200 persons who devote at least part of their time to research work. In addition to this experimental work, these stations last year sent out bulletins to over one million people. If your constituents are not getting them, they are not getting all they have paid for.

The Official Dairy Instructors' Association, of which I happen to be president, is, of course, deeply concerned with the work that your organization is carrying on. This is, of course, natural, as our association is made up of the dairy instructors who have to do with the research work carried on along dairy lines in connection with our experiment stations, the United States Department of Agriculture, and every one connected with the teaching of dairying in our state institutions. Its influence has already affected the shaping of several national laws and has done much to unify instruction in dairy husbandry in the various schools and colleges in this country. For example, it is exceedingly doubtful if our schools would have emphasized some ten years ago the same features that are now common knowledge to each student participating in the dairy cattle judging contest now finished. Represented in this contest were students from sixteen or seventeen states. The dairy score card that I believe practically all of you are using was

worked out and perfected by the Dairy Instructors' Association. The work of our dairy departments has also brought to you many of the standard methods of testing that are now in common use in your laboratories. It has, during the last year or two, given us correct, accurate and uniform Babcock testing glassware. The members of this association are not only concerned with the solving of the new problems confronting us, but are also deeply interested in getting available information before the students and the general public on this matter. Its members are not as a rule concerned with police work, but they are deeply concerned in educating the public mind, for they believe that when the public understands the danger of unsanitary milk and food, and when it understands that food articles are not up to the standard that they have a right to expect, the battle will have been half won, and your work will have been made comparatively easy and dignified in a way that would not be possible without education of the public.

Some of you who are engaged in inspection work in the West fully understand the cream situation and the problems that every one interested in dairying has been up against for the last few years. This country is not as a rule the home of the specialized dairyman, but rather the general farmer, the man interested in large farms, in wheat raising and in stock raising, and in dairying, at least to start with, as a side issue. In time this type of farmer will undoubtedly realize more fully than he does at this time the importance of the proper care of milk and cream. Serious as this problem is, there has been added to it another difficulty. The scarcity of cream in this territory has brought about more strenuous competition for cream among the creameries in this section. They have fallen into the habit of thinking they must take everything labeled cream, so the situation has often gone from bad to worse. It has now become so serious in many states that creameries, as well as many dairy authorities, have realized that something must be done to save the day from the dairy point of view.

Meetings have been held in many of our states with a view of organizing and adopting some plan of cream grading that would help the situation. The principal thought expressed at these meetings has been somewhat as follows:

The producers of cream, as well as those of other commodities, recognize the justness of a plan whereby payment can be made on the basis of quality. Such a basis governs in the sale of wheat, cattle, hogs, apples and eggs, and there is no logical reason why it should not apply in the case of cream. It costs more to produce sweet cream and, needless to say, it should be rewarded by the paying of a higher price.

As a result of this agitation, there seems to be the keenest interest in the matter of buying cream on the grade basis, and all seem agreed that now is the time to begin working on this principle. The success or failure of this plan, which means millions of dollars to the farmers in some of our states, hinges largely on the working out of an adequate and satisfactory scheme for cream grading. There should, I believe, be at least three grades of cream and the producer should be paid a premium for the better grades. The poorest should be rejected as undesirable for food. I trust the members of your association, having had experience in this matter, will give us a helping hand and the benefits of your knowledge in settling this problem.

#### EXPERIMENTAL WORK.

All investigators along dairy lines have noticed the fact that there is a great lack of experimental data concerning some of our most fundamental dairy problems. It should be our aim to cut deep and do it as systematically as possible. The unsatisfactory conditions in some lines of dairy research are largely due to the fact that too much of our work is being attempted without a well-defined purpose. There are many of us who could work and accomplish more truly fundamental work if

we had the aid and inspiration of the best trained men in work such as you are doing. There are also certain lines of work that would be more satisfactorily attacked and solved if they were carefully outlined and planned so as to be undertaken by a number of investigators, some of whom should have a thorough working knowledge of the practical side of the problem, and others with expert training in chemistry, bacteriology and physiology.

#### DAIRY PUBLICATION.

In order that the association may accomplish the great tasks that lie before it, it should have the hearty support of all who are engaged in the various instructional and investigational lines of dairy work. In my estimation this can best be accomplished by some method which will give the associations more prominence and publicity than they have enjoyed in the past. The American Chemical Society has built up and is able to hold its remarkable membership largely because of the activity and loyalty of those in the organization and the importance of the journal which it publishes. No chemist with a desire to keep abreast of the times would fail to retain his membership in the Chemical Society, for through it he has easy access to all the publications of the society. This chemical journal affords a ready means for the immediate publication of important committee reports, special papers, abstracts and original investigations by any of its members. In my estimation a journal published by our association, either quarterly or monthly, would be of almost as great service to its members. It would give the association an opportunity to publish committee reports, outlines for courses of study, and new official methods without needless delay. It would also provide for the publication of such original data as the members of the society might care to contribute immediately upon their completion. It would also afford an excellent opportunity for the publication

of such experimental work and observation as would be of interest to all engaged in this line of work, but of such a nature that it would not be desirable or possible to publish it in bulletin form.

No doubt there are many problems that can only be solved after careful and systematic study from every angle and by taking every condition into account. With a view of fostering and promoting not only a spirit of research among the members of your association and ours, but also to the end that much real work may be accomplished, I trust that there may be the closest and heartiest cooperation in handling our most difficult problems.

*"The increase of knowledge increases the need of it."*



## SOME RESPONSES FROM ROLL CALL OF MEMBERS.

MR. A. N. HENDERSON, Seattle. About two years and a half ago, there were reported two cases of typhoid fever in one of the exclusive residential districts of the city of Seattle, where sanitation was ideal. The Commissioner of Health could not imagine where these cases had originated, and his curiosity was aroused, so he sent one of the members of our Association to investigate the matter. There were eight or ten cases during a period of four or five months. There were not enough cases to be considered a typhoid epidemic, or enough to point suspicion to any one thing, except that ten cases were on a route on which a man was serving milk to ninety or a hundred customers. The Commissioner of Health instructed me to watch the dairy closely and see if there was any connection between the typhoid fever and the milk supply. We made several inspections, but were unable to determine anything that looked suspicious. The family was questioned, but denied there ever was typhoid fever on their premises. They used the city water supply. About a week or two after, I made an inspection about four o'clock in the morning, and I found the housekeeper doing the family washing in two cement tanks that were used for the washing of bottles in the milk house. I immediately criticized that operation, and I got into a talk with the housekeeper, and finally gained from her the fact that they had two cases of typhoid fever in their family ten or twelve years before at some place in Georgia. I reported this to the Commissioner of Health, and he instructed me to either close this dairy or the entire family must submit to examination of the feces and urine for typhoid bacillus. They refused such an examination. Their permit was then revoked and the cases of typhoid fever ceased upon that route. About four months ago there was a change of administration in our city and a new Commissioner of Health. The dairyman above referred

to, feeling he had been personally persecuted, immediately made application for a new permit before this new Commissioner of Health, who immediately granted the permit. When it reached my desk, I at once brought to his attention the experience we had had with this dairy. He then cancelled the permit and made the same stipulation as the previous Commissioner of Health. The dairyman's family then submitted to the test. An examination of feces and urine of his entire family was made. Both the proprietor and his daughter reacted to the test, typhoid bacillus being found in both instances, although it was fourteen years since they had typhoid fever. There is no doubt in my mind that the washing of their soiled clothes in the same tub that the milk bottles were washed in caused the typhoid fever. The tub became contaminated and the bottles washed in the same tub were not sterilized, and in that way ten or twelve cases of typhoid fever were traced to this dairy. We now require every dairy to be equipped with a sterilizer for the sterilization of all bottles.

MR. R. I. GORDON, Tampa. We have had two or three experiences in Tampa that I will just mention. There is a certain physician in Tampa that had two or three patients in his office with a very peculiar throat trouble, and the next day he had a good many more patients, and the next day they kept increasing, until he had thirty or forty. He finally called the disease septic sore throat. He immediately called me up, and I looked up the source of their milk supply, and found they were all getting milk from one producer. I went out and stopped that producer from selling milk in Tampa. An examination of every cow in the herd was made. We finally located the trouble. Streptococci were in the milk, and we prevented the further spread of that disease right there.

Tampa is in a warm climate, and it is very expensive to keep the temperature of milk down low. I arrested some people who were violating that section of the ordinance relating to temperature, and the matter was finally adjusted outside the



courts. The dairymen promised to comply with the ordinance, and they are now delivering all milk to customers at Tampa below 50 degrees F.

I know through my short experience with this Association that this will become one of the strongest associations we have. The points that I obtained here last year have been very beneficial in raising the standard of the milk supply in the city of Tampa.

PROF. C. B. LANE, Philadelphia. Perhaps the most important thing from the health standpoint is our ordinance requiring that all milk should be pasteurized. An injunction was served to prevent the ordinance. We went to the courts, other experts on pasteurization were called as witnesses, and as a result, we now have pasteurized milk. Raw milk, however, can be sold if it comes from dairies scoring 80 per cent and tuberculin tested. Much money is being spent to test cows for tuberculosis. One large dealer boosts the prices to all producers who come into the clean milk class every month, which means that they must score 75 to 100 points. In one place 25 per cent of the men were in the clean milk class, and now over 75 per cent are there. Effort is being made to hold up the standard of milk. In certain sections Holstein cows are being put in lately and the quality has run down to  $3\frac{1}{4}$  to  $3\frac{1}{2}$  per cent of fat. Such a producer should take Holstein prices.

MR. JOHN H. LYLE, Minneapolis. I am glad I was here last October, for I think some of the effects followed me back to Minneapolis, as I got into a better milk campaign. The first dairy I tried to condemn, I brought the man in before the judge, and I had to make some pretty strong statements of conditions at the place. The judge became interested at once and said he would like to see that himself. He continued the case until the next week and went out to the place with me. He took a newspaper reporter along, and photographs were taken. I showed the judge the body of an old horse in the manure pile against the barn, and he gave the dairyman twenty days in the

workhouse. That man is now running a "blind pig" in the outskirts of the city, but, thank God, we got him out of the milk business.

I just want to read you a few headlines in the newspapers, and you can guess something of the experiences we have had during the past year:

"Must Sell Dairy or Serve Twenty Days." "Dirty Milk Bottle Cause of Ten-Dollar Fine." "Milk Inspectors to Work Sundays." "Thirteen Milk Men Fined." "More Milk Men Arrested." "Thin Cream Dealers Fined." "Bacteria Test is Upheld." "Milk Germs Exceed Millions." "Ten Charged with 'Thin' Milk Sales." "Milk Law Violators May Go to Workhouse."

We have had eleven arrests on bacterial count, our legal limit being 500,000, and we can get a conviction above that. We have not in the last three years lost a single case. The first cases were contested. The fact that they could hire the best attorneys meant very little when there was a clear violation of law.

For the first time in the history of Minneapolis we have made a complete score of the 565 dairies within a radius of 20 miles of the city. Nineteen of those dairies were absolutely condemned and thrown out of business. Seventeen of them that scored 38 showed a proper disposition to put in the improvements we ordered, and in fifteen days or so, as soon as we could do so, they were rescored and they averaged 63 points.

DR. WM. H. PRICE, Detroit. I want to take the few minutes that are allotted to me to advocating the keeping of good records. There is a tendency on the part of the energetic and enthusiastic man to forge ahead in the actual achievement of certain results, and unfortunately there is sometimes a tendency to neglect the very important work of keeping good records. One of the serious things that is an obstacle to good work is the apathy on the part of the public. That results, perhaps, in a meager appropriation. I believe the best way to pre-

pare a defense against those things, in fact, to take a person out of the defensive position and put him in an aggressive position, is the presence of good records. The public is interested in the matter of public health, which is of such great importance, but the public is called upon to give attention to a great many things, and the public is generally minding its own business, and is not going to give more than a fleeting attention to any one of the things that it is called upon to give attention to. It is a part of the work of a man who has a mission to further to so prepare his data that it is in available shape. If he keeps this data in the form of pictures and charts, they attract the eye, and naturally further the object for which he is working.

*"We become a part of all we meet."—Emerson.*



## THE MUNICIPALIZATION OR CENTRALIZATION OF A CITY'S MILK SUPPLY.

C. W. SIMPSON, Vancouver, B. C.

By way of preface let me say that this scheme would be only practicable in the case of young or small cities, and could not be made applicable to any of the big cities, as will be readily seen.

Every one connected with milk inspection knows that in small cities, and even big cities, there is a certain number of milk dealers who try to do right, but who, through lack of practical and scientific knowledge, fail in their honest endeavor. Others, again, are willing enough, but "do not see their way clear," or "it would not pay them even if they had the money," while again there are others who "will not at any price," perhaps through pure obstinacy, perhaps through absolute ignorance, or perhaps, like an Irishman, through sheer love of fighting.

Roughly my idea is, that until such time as ALL milk is produced under perfect conditions, it is obligatory to clarify and pasteurize ALL milk, excepting perhaps certified milk. Therefore, let the City Council step in and say, "All milk sold in this city MUST be pasteurized by us." The city could then either build, buy or appropriate the most up-to-date plant and pasteurize all the milk.

To carry the thing out properly, the following could be done: The city could close up all the milk plants in the city and pay each dispossessed milk dealer with shares in the municipal milk plant, the number of shares being awarded pro rata to the value of the plant and trade.

By that I mean, each dairy building, plant, and equipment would be valued, and the owner would receive the equivalent in shares, while the trade would be rated at so many shares per gallon; thus a dispossessed milk dealer would receive the equiv-

alent of his premises and trade in shares. Further, to insure success the original shareholders, i. e., milk dealers, should have the right to elect the first board of directors and the first managing director, the voting being per share; for surely the man who has built up the largest business should be the best man to run the civic milk plant. All milk dealers should have the right of employment, but of course on the same basis as a paid employee, receiving no favors. Thus the dispossessed dealer would receive his 7 per cent dividend on his shares, as is shown later on, and a wage according to the position he occupied.

The remainder of the shares of small face value and at par could be offered to the public. The small face value would enable the poor man to invest in a safe and profitable business.

To each "card" of tickets sold let there be a coupon attached, and then, after all expenses have been paid, let the city declare a fixed dividend of 7 per cent to its shareholders and return the balance of the net profit to the consumer at so much per coupon torn from the card of tickets. This should, to my mind, constitute a people's milk plant, owned by the people and run in the interest of the people.

Some of the advantages that would accrue would be:

(1) All milk being received at the civic milk plant would be subject to tests for butter-fat solids not fat, sediment and bacteria. The farmer shipping milk above a certain standard could be paid more for it than another farmer whose milk was not so sanitary, while the farmer whose milk did not reach a certain minimum standard would have his milk condemned until such time as it complied with the requirements.

(2) The city, by owning and operating the milk plant, could afford to engage a milk expert, whose word would be final in all matters pertaining to the milk, thus ensuring, theoretically, the perfect handling of the city's milk supply.

(3) The milk expert, being also the official city milk inspector, would have his office and laboratories on the premises,

thus avoiding the tremendous waste of time now involved in collecting samples and visiting milk plants.

(4) The money saved the city by their inspector being paid by the civic milk plant should be spent in sending inspectors out to teach the farmers how to produce sanitary milk and make more profit thereby.

(5) To prevent collusion between the milk expert and other dairy officials with whom he would be in intimate association, the state or provincial, Dominion or Federal inspectors could make periodical inspections and examinations.

(6) The public would benefit further in that there would only be one plant, one running expense, one management, instead of many, thus effecting an enormous saving; while the fact that only one wagon would deliver along a street in place of five or six is too evident an advantage to require further comment. Thus would the cost of milk be lowered and placed within reach of all.

By these means we could ensure as pure a milk supply as is humanly possible, and at a price that would enable all babies to have plenty of wholesome milk.

The one great objection would be—politics. Where a municipality starts to do municipal work, every one with a political “pull” expects to get a soft job, and all consider the city fair game for graft. This is why I proposed to have the milk dealers on the board of directors, and they should be well enough paid, or paid in such a manner, that it would be against their interests to allow any leak in working expenses. I think the multitudinous advantages outpoint the problematic disadvantages.

My other point, i. e., “Centralization,” would be effected by the city granting a charter to a corporation, and would combine all the elements of the civic milk plant with certain provisos.

To this—in spite of all its advantages—would be raised a loud clamor of “Monopoly,” and, to my mind, rightfully. The

true interests of the people necessitate competition, for without competition the corporation would grow autocratic; they would not be content with fair dividends, but would raise the price and lower the quality. Under civic management, competition among the farmers is invited by the increased price obtained for the most sanitary milk.

*“If a thing is true in principle it will become true in practice when you put the theory into practice.”—Hoard’s Dairyman.*



## THE MILK SUPPLY OF SCRANTON, PA.

FRED J. WIDMAYER, *Food and Milk Inspector.*

In the year 1906 our city experienced the ravages of typhoid fever in sectional districts. The cause of infection in one district was, after thorough investigation, traced directly to milk.

This caused the appointment of an outside dairy and watershed inspector, and the crusade for better milk was on. Up to the present time, by a systematic campaign of gradual education, based on economic and sensible application and enforcement of the rules and regulations of our department, we still retain the good will and cooperation of the milk producer and the city milk dispenser. The result is our city is having a good, clean milk supply.

On the first visit, the dairy inspector leaves a copy and explains the requirements of our department. They are printed on linen and posted in a conspicuous place on the premises. This is followed by an inspection of the cattle and premises, and results are recorded on the United States Score Card.

Inspection by the city milk inspector is made at the rural receiving station of each can of milk delivered by the producer. This inspection includes temperature, specific gravity and sediment tests, and the obtaining of samples.

Chemical, bacteria and leucocyte tests are made at the city laboratory. Results of the tests are mailed to the producer, with instructions how to remedy the noted shortcomings. One reprimand is generally sufficient to secure improvement. The producer showing no inclination to comply after a second notification will have his milk stopped from being sold in this city. This proves to be a prompt and inexpensive method of punishing persistent offenders, as it is almost impossible and of slow progress to obtain conviction before a rural justice of the peace. Frequent inspections at all railroad and electric stations in the city are made. Return cans receive special attention. Partially

washed cans and cans containing water are returned to the shipper with a notice not to have it occur again. We insist that all return cans must be steamed and thoroughly dry.

Pasteurization plants are visited weekly, automatic records examined and filed.

Milk wagons, stores and markets where milk is sold are inspected frequently. Prosecutions for adulteration by water and by the use of preservatives are of rare occurrence.

Our milk supply is produced at about 600 dairies, within a radius of 35 miles, delivered by steam and electric conveyance.

Population (approximate) 140,000.

Daily consumption of milk about 35,000 quarts.

Eighty per cent of the milk is pasteurized.

Ten per cent of the milk is special.

Ten per cent of the milk is Class "c."

The public press has given this department splendid support in publishing milk records and by timely, seasonable comments on the care of milk.

Lectures to civic clubs by members of this department have also been of great assistance in improving conditions.

In the absence of state and city laws for compulsory inspection of dairy cattle, we are pushing pasteurization of the entire milk supply. We hope to accomplish this before the passing of another year.

*"Just as the insurance men have realized that it is better, by care, to keep their policyholders alive to pay premiums than it is to let them die and have the companies pay death claims, so our cities are learning that to grow in population and in importance it is not only necessary to attract new citizens, but it is necessary to take care of the health and lives of those they have."*—Goler.

## SOME THINGS THE DAIRY INSPECTOR CAN DO TO EDUCATE THE CONSUMER.

ERNEST KELLY, in Charge Milk Investigations, U. S. Dept. of  
Agriculture.

There has been much discussion of the relations that should exist between the dairy inspector and the dairy farmer. This matter has been fully discussed before this association and it has been agreed that the dairy inspector should stand in the role of an educator and advisory officer rather than a police officer unless the exercise of his authority is necessitated by repeated and wilful violations of the law. Not enough thought has been given, however, to the relation which should exist between the dairy inspector and the milk consumer. The milk consumer is at a decided disadvantage in dealing with the milk supply, as he is unable to tell good milk from bad and is not in touch with information which keeps him up to date upon the subject. The work of the dairy inspector will be much more effective and far reaching if he enters into a closer relation with the consumer. As a matter of fact, by reason of his training and ability the dairy inspector should be the foremost authority in his community on matters pertaining to milk. It very often happens that physicians and other scientific men depend upon the dairy inspector to keep them in touch with the latest scientific developments regarding milk and dairy products. Mothers' clubs, housewives' leagues and other similar organizations which are working for a better milk supply need some one in their community to whom they can refer for reliable and up-to-date information concerning this matter.

Dairy inspectors in their work depend for success largely upon the moral support of the communities in which they work. Nothing can do more to arouse this spirit of cooperation than a broader understanding and a closer contact between the inspector and the consumer.

The information which dairy inspectors can give to the consumer can be classed under two headings: First, general information, and second, specific information. Let us for a while consider some of the items which come under the head of general information. The consumer needs to know much more concerning the food value of milk and its place in the diet. There is a very hazy conception in some quarters as to the relative value of milk compared with some other foods. Housewives who do not hesitate to pay 25 to 30 cents a pound for steak are very loath to pay 9 or 10 cents for a quart of pure milk, though the food value may be much greater in the latter case. In considering the relative values of foods it is necessary to study two things; first, the amount of protein supplied by the foods, and, second, the number of calories. In general, foods are valuable for the amount of protein that they furnish or for the amount of heat and energy. I have compiled the available data comparing the value of milk with sirloin steak and fresh eggs. In general, we find that milk at 10 cents a quart supplied protein as cheaply as sirloin steak at 25 cents a pound and fresh eggs at 30 cents a dozen. At the same price per quart, that is, 10 cents, milk supplied calories as cheaply as sirloin steak at 15¼ cents a pound or fresh eggs at 14¾ cents a dozen. At 8 cents a quart milk supplied protein as cheaply as sirloin steak at 20 cents a pound or fresh eggs at 24 cents a dozen, while it supplied calories as cheaply as sirloin steak at 12 cents a pound or fresh eggs at 11 4-5 cents a dozen. It will be seen from these figures that milk at 8 cents a quart is cheaper as regards both protein and the number of calories than is sirloin steak or fresh eggs at the cheapest market price. Milk at 10 cents a quart compares very favorably with sirloin steak and fresh eggs at their lowest prices in some sections, and is cheaper in supplying calories than is sirloin steak or fresh eggs at prices for which they can ordinarily be bought. The average consumption of milk in the cities of the United States

is only about .6 of a pint per capita per day, and it is believed that a fuller knowledge on the part of the consumer regarding the food value of milk would lead to much greater consumption of milk; in fact, a lunch consisting of a box of crackers and a pint of milk contains more nourishment than can be obtained in a restaurant meal costing at the cheapest restaurant from 25 to 35 cents.

The consumer should also have reliable information as to the means by which milk is contaminated from the cow to the consumer. The consumer should be taught that all milk is not dangerous, but milk is usually a good and economical food; however, the dangers of unclean milk should be carefully shown so that the consumer may realize the full importance of the question. These instructions should not only deal with contamination which may occur at the farm, but also with dangers that lurk in unsanitary methods in the city milk plant and in the stores where milk is distributed. Further than that, the consumer should be taught that perfectly good milk can be so treated in the home that it becomes a dangerous food. The average consumer does not realize his responsibility in caring for milk in his own home. The doctrines of cleanliness and cold should be preached vigorously before the housewives. Those who hesitate to pay a trifle more for clean milk should be shown that such investment is an economical one in view of the greater protection afforded. In fact, it is a sort of health insurance with very low premiums. It should also be shown that a high grade of milk costs more to produce than does an ordinary grade, just as is true with any other form of merchandise. Many consumers have a very hazy idea of the meaning of the term pasteurization. In many quarters there has been considerable feeling against pasteurization of milk because its true nature was not known. The consumers should be taught that pasteurization properly performed does not injure the quality of the milk in any way, but on the other hand makes it safer.

The specific information that consumers desire to have relates to the sanitary condition of the various farms sending milk into the city and to the quality of the milk dispensed by the various dealers. The milk inspector is a servant of the people and they must rely upon him for information concerning these details. The workings of the milk inspection department should not be a mystery in any way and any consumer should be able easily to find out the score of the various farms and the bacteria count of milk from various sources. It sometimes happens that certain dairies put out milk which is labeled special milk or has some other designation which indicates that the milk is of superior quality. Occasionally this milk is not of such quality that it deserves its name and the consumer should be able to tell whether or not the extra price charged is warranted. Where milk is sold as a special milk and is not superior to the ordinary grades of milk sold, the consumer is defrauded and the reputable producer or dealer suffers through unfair competition.

Another thing in which the consumer is interested is the fat content of the various milks sold. This brings up a point that I believe is very important, that of grading milk. I believe that the only equitable system for the sale of milk is a uniform grading system whereby the careful producer can receive more for his product and the particular consumer can obtain the grade of product he wishes to pay for. The State of New York has lately adopted a grading system which is intended to be uniform throughout the state. Such a system, of course, depends for its success upon having a sufficient inspection force and an adequate laboratory to keep the milk properly graded. I feel very strongly that such a system will do more to impress the consumer with the fact that there are different kinds of milk than will any other system. Bacteria counts and dairy scores once read are soon forgotten by many consumers, but if the milk is delivered every day with a distinctive label showing

its grade the fact is ever before the housewife. People buying a Grade C milk, for instance, will know that there are better grades of milk which can be purchased if they so desire.

The best method of presenting this information to the public has been the source of considerable argument among public health officials. Some health departments publish no results, and the records are accessible only if the consumer cares to make a personal visit to the health department. Such a system limits the dissemination of information to the small group of people who have enough interest to make personal inquiry. Other health departments publish the results either in the form of a bulletin from the health department or in the daily papers. I believe that the public is entitled to know the results of the dairy inspection for which they pay, but I would add a word of caution in connection with the publication of these results. Often considerable injury has been done to conscientious dairymen through the publication of incomplete findings. I do not believe that the publication, for instance, of an individual bacteria count is the fairest method. Counts on some of the dairies may be taken during cooler weather and on others during hot weather, and the results are not comparable. Then, again, one dairy may have an exceptionally high count, and if this count is taken as an index of the general quality of the milk furnished by that dairy, it does not show an average condition of affairs. If the publication of results is to be carried on, and I believe that this is warranted, I suggest that in the case of farm scores and chemical analyses, averages be used containing the results of at least three inspections or chemical analyses. In the publication of bacteria counts I know of nothing better than the method suggested by the National Commission on Milk Standards. This commission recommends that the grade of milk be fixed at 4 out of 5 samples; that is, if 5 samples are taken, one sample may run extremely high in bacteria, while the other 4 are quite low. This would show

that this particular dairy on the average produced milk of a good quality, but through some slip there was something wrong at the farm when one sample was taken. I believe that this system is better than striking an actual average of the counts for this reason: Suppose that 5 counts taken on a certain milk run as follows: 4 counts of 10,000 and one count of a million. If these counts were averaged the average count would be 208,000 bacteria per c. c., and yet four-fifths of the time this dairy was furnishing milk with a count of only 10,000.

In closing, I should like to add just a word of appreciation as to the work that is being done by this association toward the standardization of inspection systems. One of the greatest difficulties that we encounter in our work is the lack of standardization and the corresponding chaotic state of affairs as regards dairy inspection. Dairy inspectors are prone to think that their localities have a problem which is purely local, and while this is true in many minor details, still I have found the country over that the underlying principles of clean milk production are the same and the same methods are desirable. Such an association as this, where inspectors from different parts of the country can meet and discuss problems on a common footing, cannot fail to accomplish great good.

#### DISCUSSION.

MR. L. P. BROWN. It is a great problem to know how to get it to the consumer. I am not going to make the same error that one of my colleagues in another state did, and say that women's clubs are no good at all, that they don't do anything for you. I do say it is very difficult to get the proper attention of women through their clubs. We are undertaking that in Tennessee, and we are getting some results, at least, if we are to judge by the expressions which the ladies have been kind enough to utter. Among the other means which we use in



Tennessee are talks to the various clubs on subjects connected with our work.

As to the proposition of instructing the consumer, we might possibly devise some means of taking a leaf out of our butter-maker friends' book, and get every dairyman in our own district to print a booklet, and whenever he acquires a new customer he would present that customer with that leaflet, with full instructions as to how to take care of that milk, and the consequences of neglect. It shows the customer the dairyman's interest in his work.

MR. A. C. NORRIS. The work we are doing along this line has come to us from the consumers themselves. The Health Department has been asked on several occasions to give talks before the members of the W. C. T. U. I always preface my remarks by saying as they would not allow a man to drink intoxicating liquors, presumably they were in favor of having him drink good milk. We were asked by three or four Brotherhoods of the churches to talk before them, and about this time the Grangers out in the country invited us to come out and tell them about bacteria. They thought the farmers ought to hear about these as much as any one else. There is hardly a week that we do not give a talk, either before the men who produce milk, or before the women, or men, who consume it. The work is bearing fruit. I always advise the consumer to go out and see the farms, and hand them an inspection card.

MR. LOMBARD. Our department has gotten out two publications, one a leaflet on the food value of milk, and the other a card on the care of milk in the home. There are about ten simple rules, and we have given out thousands of these, and the principal ones who have applied for them have been the milk inspectors and milk dealers, and one concern in Boston alone had some three or four thousand copies of "The Food Value of Milk" that they were giving out to their customers. We found this demand exceeded our fondest expectations and

we had to have two or three editions of this pamphlet, and it has proven a great help for the consumers throughout Massachusetts to have some reliable, authentic information on the food value of milk and the way to take care of milk after it is delivered to their homes.

*“It is because the enemy we have to fight is so still, so secret, and, to the uneducated mind, so mysterious, that it is extremely difficult, as we all know, to get the people to realize the danger.”*  
—Richard H. Lewis.

WHERE DOES THE RESPONSIBILITY OF THE  
MILK DEALER BEGIN AND WHERE  
DOES IT END?

JOHN D. NICHOLS, *President, International Milk Dealers'  
Association, Cleveland.*

Over at Oberlin, Ohio, a farmer driving across the Lake Shore Railroad tracks came in contact with a fast moving train; his horses were killed, his wagon demolished, and, as is customary, he had to sue the company for a settlement. The gate tender at this time happened to be an old negro, and of course was a very important witness. During the cross-examination, the attorney for the plaintiff said to him, "What is your name?" "Rastus Johnson." "Rastus, where were you on March 8th, at about 8 P. M.?" "I was right here, sir." "No, you were not right here." "Yes, I was." "I say you were not right here; this court was not open Wednesday night, March 8th." "No, sir, I wasn't right here in dis here room, I was here in dis here town." "Whereabouts were you in this town at the time of the accident?" "I was down at the crossing, sir." "You saw the train coming?" "Yes, sir." "You saw the plaintiff driving up the street toward the track?" "Yes, sir." "What did you do, if anything, to avoid the accident?" "I took a lantern, I stood on the crossing and I waved that lantern just as hard as I could wave it." "What kind of a lantern was that?" "Why, it was one of them lanterns with a tin bottom and a tin top and had wires around it and had a red chimney in it, and I just done waved that lantern until I had to jump out of the way to keep from getting hit by the train." "Did you call to the plaintiff and tell him to stop?" "No, sir, that wouldn't do any good, the noise of that train and the noise of that der wagon, he couldn't hear nothing; I just done waved the lantern." Upon the testimony of the old negro, the defendant won the suit. After the verdict, the defendant's

attorney put his hand on the old negro's shoulder and said to him: "Mr. Johnson, I want to congratulate you upon your ability as a witness. It was your testimony which won us the case." To which Mr. Johnson replied: "Yes, sir, but you know I done wondering all the time what I was going to say if that there lawyer had asked me if dat der lantern was lit." Now what I am wondering is what I am going to say when you boys ask me a lot of questions.

"Where does the responsibility of the milk dealer begin and where does it end?" is a very elastic subject. As you boys well know, there are inspectors who seem to think they have no responsibility, and I am ashamed to say there are a great many milkmen like them. They have no conception of right and wrong, their responsibility is just as great as the health authorities, through the inspectors, make it, and no more. They have no conscience, they slide along any old way, do just as little as they can to keep from being closed up by the Board of Health, and yet, their goods are sold in competition with those of the expert milk dealer, the man who is spending unlimited capital for twentieth century equipment, who is buying the best talent that money can buy. This unscrupulous cuss who just skins through by the skin of his teeth has the endorsement of you gentlemen; the license on his wagon is his authority to do business and proof of my statement.

The responsibility of this type of dealer in the picture that I have painted you—this picture which is true to life and will stand enlarging in every city of the land—rests with the health authorities and their inspectors. Your ordinances should be drawn up on knowledge, not on guess work or debatable experiences. Ordinances drafted on these lines will be sane and just and after they are adopted they should be rigidly enforced. I have known of inspectors replying when asked why they did not make some irresponsible dealer do certain things, "Why, he won't do it, and we cannot make him." I did not force him for his reasons, but I suppose they were political. Out with

politics, in with justice. Again, I must say that the responsibility of the dealer begins and ends with the health board and their inspectors.

The expert milk dealer is a distributor, a middleman, if you please to call him so; he is a necessary link in a very essential chain that extends from the broad fields and stables of the producer to the home of the consumer, and you cannot legislate or put him out of this chain without serious damage to all parties. There is a great and growing tendency on the part of the multitude to leave the producing fields and congregate in the industrial centers. You inspectors who have the field work to do know that this is true, and it has become so serious that it is almost impossible for the producer to secure sufficient intelligent labor to do his dairy work. Although you gentlemen may not appreciate it, this is just as true of the expert milk dealer, and there are men who have to pay salaries of twelve hundred a year to get men to drive a milk wagon, whereas the average teamster gets about one-half this. This is part of the responsibility of the dealer to the consumer, to see that they get good service, and part of his responsibility to you is to see that you boys have intelligent men to talk to when you take their samples.

The consumers in our industrial centers are too busy to spend any time to ascertain the source of their milk supply, or the conditions under which it is handled. They look to the dealer to protect their interests, and now we come back to the irresponsible and unscrupulous dealer in competition with the honest, reliable dealer who takes the responsibility and guards this important, delicate and necessary food product from the producer to the consumer.

In the early days before this congestion of population, the dealer was a producer and had at all times his product under control from the stable to the table. This is still true in some sections, and still further emphasizes the fact that regulations should be based on knowledge of the particular territory that

they are made for, and you gentlemen must realize that regulations which could be easily adopted and carried out in Waterloo, Iowa, and Omaha, Nebraska, would be impossible to enforce in Chicago, New York or Boston. But now it's different. The producer makes milk that he supposes is good. His stable conditions, his water supply, his milk house, his herd of cattle have met the approval of you gentlemen and he has the endorsement of the health board, who may have issued to him a license to make milk for a certain market. Should the fact that this producer has a license, reduce the responsibility to us, the dealers, or should it not? I think the world over, the seller is responsible to the buyer until the goods are delivered into his possession. But here enters one of the unfortunate features of the milk dealer's life. He goes to the receiving platform and receives from one or more producers a few or many cans of milk. This dealer has in his office the list of accepted dairies and may have the score of their stables and surroundings as made out by you gentlemen, and he has the assurance of the health board that the producers whose milk he has bought are A-1. This dealer may sell this milk either in a quart bottle or by the ten-gallon can, within a very few hours of the time that he received it, and it may never have gone through his plant. But along comes one of you young men, you take a look at the milk, it looks good; you smell of it, it smells good; you may taste of it, and it tastes good; it seems all right to you, at least you cannot condemn it; but you take a sample of this milk to the bacteriological laboratory; the milk in the bottle or can goes into the home or restaurant and is consumed within twelve or twenty-four hours. Some twelve or twenty-four hours after this milk has been consumed, the bacteriologist has discovered that this particular sample of milk that looked, smelled, tasted and in all ways seemed good to you, contained from three to five million bacteria. "Where does the responsibility of the milk dealer begin and where does it end?" "Knowledge is power." Who has the knowledge?

I believe that you inspectors will agree with me that the story I have told is undoubtedly true in every city in this land, in every year of our existence; so that you can understand that with a bacterial standard as the base of either a legal or criminal prosecution, the milk dealer would never know where he is at. He would not know whether he was going to spend the coming Sabbath with his family or in the criminal court. It certainly is just that the dealer should be held responsible for his own acts, but he should not be held responsible for the sins of others. Especially is this true, when the sinner has the endorsement of the health board which has been given him through the report of your inspectors. Just so long as you inspectors or your superiors cannot come to the dealer's plant, carefully inspect the milk that he is to deliver the next morning before you are up, and tell him that it is within the law, you should refrain from making a bacterial standard a basis of prosecution. In other words, you should not impose upon the dealer any regulations that modern practice or science has as yet been unable to prove practicable. As to the responsibility of the milk dealer, he is in about the same position as any other merchant who buys the products of the farm and delivers the same to the consuming public, excepting that milk, being a highly perishable article, requires a vast amount of care. The fact is very well established that the larger dealer is so well equipped that milk suffers but little while in his hands. The dealer certainly should be responsible for the milk while it is in his hands, he should be responsible for his plant and its equipment, and the reliable dealer should be, and is, ready at all times to work with the health authorities and their inspectors. The inspector should make it his duty to explain the methods to the dealer that will make it possible for him to comply with the regulations. The inspector should not, and I believe does not, feel it his duty to prosecute, for by so doing you will not get the cooperation of the dealer. The consuming public has a right to expect that milk shall be clean, pure and safe. And the dealer

and the inspector must work together to arrive at standards that are practical and that will give the consuming public this kind of milk.

Chemical standards are easy of enforcement and quick to ascertain and should be watched closely. If the producer or his employee puts water into the milk or takes cream out of the milk, or uses preservatives to keep it sweet, he should be held responsible, and not the dealer. If the dealer puts water in his milk, skims it or adds preservatives, electrocute him; he has no place in society.

I am going to close by saying the responsibility of the milk dealer begins and ends with the board of health and their inspectors. I believe that the inspector should be held responsible for the quality of the milk that is served to the public, and he should not try to shirk his responsibility by putting it up to the distributor, and I wish to say that the up-to-date distributors are now, have been, and will in the future be ready at all times to work hand in hand with the health board and their inspectors to improve the milk supply.

And in conclusion, gentlemen, I wish to say that when you find a dealer who is doing irregular things, who is selling milk below the standard, that you take a sufficient amount of time to fix the responsibility and then secure redress from the guilty party.

*“Inspection is primarily a health proposition. The object of inspection, as applied to the milk industry, is to give us cleaner, fresher and safer milk.”*



## THE DETERMINATION OF BACTERIA IN MILK.

S. HENRY AYERS, Dairy Division, U. S. Department of Agriculture.

The determination of bacteria in milk, while it may seem a rather elementary subject, requires much more consideration than is given to it by most workers in the field of bacteriology. We may spend much time trying to convince people that bacterial counts are of great value and yet we have no reasonable answer to give to the man who says, "I have sent three samples of the same milk to three different laboratories and have received three different results, ranging from tens of thousands to millions, so what value has a bacterial count?"

All bacteriologists can of course answer a question like that, but not without injury to the value of bacterial counts. The reason for the three different results is perfectly plain, three different laboratories each with its *own particular method* for making plate counts, and this explains all.

Now, emphasis must be laid on the fact that in making a bacterial count we are dealing with living organisms which are extremely sensitive to conditions under which they must develop, and in order to determine the number of bacteria in milk we must use exactly the same methods the world over if we wish to carry the bacterial count to its highest degree of accuracy.

A number of points can be discussed which deserve particular attention in the determination of bacteria in milk. Some of these points may seem purely theoretical, but during examinations of many thousands of samples of milk we have found them to be of great practical value.

To say that all glassware, dilution bottles and media must be sterile is unnecessary, but although sterile when fresh they may become contaminated before use. Plates should be sterilized in metal cases and kept in them until used, and should be resteril-

ized at short intervals to destroy air contaminations. While only a few air organisms may be in a plate, and their numbers would not add many to the total count, they are as a rule of the type which forms spreading colonies which restrict the development of other bacteria and so may influence the count to a great extent.

It is desirable when possible to use petri plates with a diameter of 140 to 150 m. m., instead of the small, ordinary sized plates commonly in use. The count is most accurate when the dilution is such that about 200 colonies are on a plate, but with even 200 colonies the ordinary plate is crowded and the colonies are so close that products of growth may exert an influence over nearby colonies and restrict their development. When a large petri plate is used 200 colonies may be spread over the plate at a considerable distance apart, and even 300 or 400 colonies may develop without overcrowding the plate.

The kind of pipette used is of great importance. In many laboratories a pipette is used which delivers one cubic centimeter and has but one mark. When these are used it is the general practice to dip the end of the pipette in the dilution bottle and rinse it out. This, of course, introduces more than one cubic centimeter, for there is always an indefinite amount of milk which sticks on the outside of the pipette. This extra amount is added with the one cubic centimeter. Then, again, when milk is drawn up into the pipette it usually is drawn above the one c. c. mark and then allowed to run down to it, so when the pipette is rinsed the amount which adheres above the mark is also washed in with the one cubic centimeter.

When these pipettes are used the ends frequently become broken off and in consequence less than one cubic centimeter is delivered. To avoid these sources of error we use a one cubic centimeter pipette which delivers one cubic centimeter between two marks, and the pipette is never rinsed into the dilution bottle. It is, of course, true that a small amount of milk may ad-

here to the side of the pipette, but the error is very small compared with the other style of pipette.

Inaccurate dilution bottles are things we should eliminate. Care must be taken to see that the dilution bottles contain exactly the proper amount before sterilization. If a bottle tips over, several cubic centimeters will be lost in the cotton plug and the contents of the bottles will then vary. Such bottles should never be used. Dilution bottles should be stored at a low temperature to avoid evaporation, since this introduces another source of error.

Probably the reason that different laboratories obtain different results is due largely to the fact that different media are used or that the same medium is made in different ways. It is true we have standard methods for making media, but it is not true that every one uses these methods. In fact it is possible to go a step farther, and say that it is impossible, even following the standard method, to make two lots of media exactly alike. The standard method gives the method of procedure and the ingredients, but the steps are not fixed with sufficient accuracy to enable two men to prepare media with exactly the same composition. Some steps can be made definite. Distilled water, for example, should always be used in place of tap water. Tap water in different localities varies greatly and may add to the medium various inorganic salts which may greatly affect bacterial growth. The meat should be infused in a definite way in regard to time and temperature, but from this point on the preparation of plain infusion agar becomes more difficult to control. It is, of course, the object of every medium maker to get a clear infusion agar, and to do this the broth and broth and agar mixture may be filtered again and again whenever a precipitate appears. These precipitates appear usually when the reaction is adjusted and the broth heated. As these precipitates are largely albumen, it will be seen at once that the amount removed will vary greatly and undoubtedly influences the ability of the medium to support

bacterial growth. If time permitted it would be possible to say more regarding this point, for it is a matter of considerable importance.

The reaction of the medium plays a very important part, and we have obtained the best results with a reaction of +1.5, Fuller's scale. Of course it cannot be expected that any one reaction will be equally suitable for all species of bacteria, so it is a question of using a reaction which gives the highest counts. To illustrate this point a few figures may be given.

<i>Reaction of media</i>	<i>Per cent of bacteria</i>
+1.3	100.00
+0.8	76.33
+0.15	3.92

The highest count was obtained with the medium having a reaction of 1.3, and in computing the results it is assumed that the count was 100 per cent of the bacteria present. The medium with a reaction of 0.8 showed only 76.33 per cent of the total bacteria, and when the reaction was +0.15 only 3.92 per cent of the total bacteria developed. This illustrates the importance of reaction of the medium.

For total counts plain infusion agar is generally superior to meat-extract agar, although with certain bacteria meat-extract agar is better. These are, however, special cases.

In general it may be said that plain infusion agar gives higher counts than lactose infusion agar. There are, however, certain cases where the sugar agar may give as high counts. This is true when the majority of the bacteria belong to the acid group.

Another thing to be considered is the age of the medium used for plating. A fresh medium will allow bacteria to develop much better than the same medium that has been allowed to stand and dry. Media consequently should be stored at a

low temperature to prevent drying due to the evaporation of the water.

Besides using exactly the same medium we must use the same temperature for incubation. The standard method allows incubation at 21 degrees C. for 5 days, or 37 degrees C. for 48 hours. It is hardly necessary to say that the counts obtained at these two temperatures will not agree, as a rule not even closely. These temperatures represent perhaps the optimum temperature for two large groups of organisms, those whose normal habitat is the animal body and those whose habitat is the earth, water and air. We have found, however, that a temperature of 30 degrees C. allows a good development of both of these general groups of organisms. I believe that incubation at 30 degrees C. for 5 days gives on the whole the most satisfactory results.

It seems as if our object in making a plate count should be to get the greatest possible number of bacteria and not merely to get a variable proportional part of the whole, as is the case when a 48-hour count is made at 37 degrees C. Our results show that a 48-hour count at 37 degrees C. sometimes shows less than 50 per cent of the total count at 30 degrees C. for 5 days. It does not seem that a 24-hour or 48-hour count at 37 degrees C. has any advantage over incubation for the longer period of 5 days at 30 degrees C. Even with a 24-hour period of incubation the milk has passed from the control of the inspector and the results may just as well be delayed.

In the process of making bacterial counts care must be observed in taking out the sample and making dilutions. It is absolutely necessary that the one cubic centimeter taken for the first dilution represent an average sample. In taking a sample for bacterial analysis, milk from a vat, can or milk bottle must be thoroughly agitated. In taking a sample from a milk bottle we shake it vigorously 25 times. When the one cubic centimeter is removed in a pipette to a dilution bottle, great accuracy must be observed and the bottom of the meniscus should

always be read. Each dilution bottle should be shaken a definite number of times. In our work we find that shaking each bottle 25 times is sufficient. Probably a longer shaking would be just as good, but the point is that it should be uniform in every laboratory since the shaking is to break up bacterial clumps. A uniform shaking probably plays a very important part in obtaining uniform results.

Having shown some of the possible sources of error in making bacterial counts, and having pointed out the need for absolute uniformity in methods, a word may now be said regarding variations in counts which we cannot control.

As stated before, in the determination of bacteria in milk we are dealing with living organisms, and all we can do is to place a definite number on a suitable medium and allow them to develop into colonies which we can see and count. When a definite number of bacteria is spoken of we meet the first difficulty. If all the bacteria in a sample of milk were single cells and were evenly distributed we could then remove theoretically a definite number and in our dilutions we could theoretically carry a definite number. However, we know that it is impossible to take out exactly the same number of bacteria in every cubic centimeter on account of the fact that bacterial cells are often attached in clumps or chains. This is one cause of variation in counts which we cannot control.

Another variation lies in the fact that certain bacteria on a plate exert a restraining action on other forms. This is often shown on plates where a zone about a colony is entirely free from other bacterial colonies. This is a factor of considerable importance, particularly where spreading growths are found.

In view of these factors which we cannot prevent, we should take every precaution to make all the steps within our control as uniform and accurate as possible.

It is going to be hard to get a uniform medium until we come to one which is purely synthetic, but the other details which have been mentioned can and should be made absolutely uni-

form. Every one engaged in bacteriological work should do his part in urging uniformity in bacterial determinations so as to make results comparable for any part of the country and to place the bacterial count on a firm basis. Unless this can be done, milk producers and dealers will scoff at the idea of the bacterial count and claim that it is of no value whatever.

*“One truth discovered is immortal and entitles its discoverer to be so.”*





## THE PRINCIPLES UNDERLYING THE CONTROL OF THE MILK SUPPLY.

DR. WILLIAM C. WOODWARD, President, American Public  
Health Association and Health Officer of the  
District of Columbia.

We hear much of the milk supply and of measures for its improvement, but we can have no intelligent understanding of these matters until we look into the cause out of which the milk supply arises, and that is the milk demand. Without a milk demand there would be no milk supply, and the ideal supply, if it existed, would be one that filled perfectly all of the requirements of the demand. It would be a sufficient supply of pure, sound, wholesome milk, containing in a given quantity not less than a specified amount of nourishing matter, sold at a reasonable price. Out of the effort to produce this ideal adjustment of supply and demand grows the entire milk problem; or I might say, the entire group of milk problems, for there are many of them. Milk demand and milk supply, however, long antedate the problems that now confront us. The milk dealer himself is a comparatively recent factor in the scheme of social evolution, and the milk inspector appears even later on the scene. For it is a far cry from the tribeswoman milking her goat in the shadow of her tent, to the intricate system by which milk reaches the consumer in a populous city of to-day.

In the working of the system that produces the urban milk supply of to-day, the vendor, the inspector, the judge and the consumer play parts, and it is only as each understands the particular part he is to play, alone and in its relation to the part of all others, that smoothness of operation and sufficiency and good quality of output can be expected.

The one person who furnishes the motive power that operates the entire system for the production and distribution of the milk supply is the consumer. It is he who pays the bills. It

is his sense of decency that is outraged when filth is mixed with the milk that is left at his door. It is his health and life that are placed in jeopardy when an unwholesome milk is put upon his table. Certainly, then, it is the consumer who is entitled to say what kind of milk shall be produced and sold, and the vendor, the inspector and the judge are but his agents to execute his commission. Except for the relatively few persons having their own cows and those who use no milk, the consumers make up the entire community. It is natural, therefore, that the conditions governing the sale of milk should have been made largely the basis of community action; that is, action by the legislative body, by whatsoever name it may be known, through which the community acts.

According to the theory of our government, the majority is entitled to rule, and community action when taken through the lawfully established channels is right action. Such action as the community has taken with respect to the milk supply is no exception to the general rule, and there is a presumption that the laws and regulations governing the production and sale of milk are those best suited for their purpose, namely, to secure for the community a sufficient supply of pure, sound, wholesome milk, at a reasonable price. Producers and vendors of milk commonly blame the "scientists" and "faddists" for each and every feature of milk laws that seems to them unnecessary and possibly onerous, forgetting that the legislative bodies by which such laws are produced are not made up of either scientists or faddists, in so far as knowledge and opinions with respect to the milk supply are concerned. The only common bond that binds all legislators together with respect to this matter is that they have been, and most of them are, consumers of milk. Moreover, their constituents are made up of consumers of milk, rather than of inspectors, bacteriologists, physicians or any other one class having a special interest in the milk supply, and the legislators, in whatever they do, act in the interest of their constituents, the consumers. Moreover, in so far as

members of legislatures and of city councils have any special knowledge of the milk supply, it is safe to say that more of them have acquired that knowledge as producers and vendors of milk than as chemists, bacteriologists and physicians. And certainly the producer and vendor have equal access with the chemist, bacteriologist and physician to the legislative body, for the purpose of assisting it in the enactment of the best possible legislation in the interest of the community. If, therefore, in any community legislation for the conservation of the milk supply is not wise legislation, the community must be blamed for it, and not the chemist, the bacteriologist or the physician, and for its unsatisfactory character producers and vendors of milk must accept at least equal responsibility with every other group.

Community action with respect to the milk supply, as represented in legislation governing it, is merely one of the results of the evolution of community life. In the absence of legislation concerning the matter, any person desiring milk of a given quality would have to enter into a contract, written or oral, with some other person, just as he does now, to supply such milk. But under such circumstances, in order that there might be an agreement as to the quality of milk to be served, everything pertaining to it would have to be embodied in the contract; in order to insure such milk as the law now calls for, each and every condition and circumstance now embodied in the laws governing the production and sale of milk in the community in which the transaction took place would have to appear expressly as a part of the private contract. Provision might be made, and if the contract were wisely drawn would be made, for the inspection of the dairy farm, the cattle, the milk, and everything related to them, by the vendor or by some one acting on his behalf. Reasonable penalties would be provided for breach of the contract, and the contract would be enforceable in a court of law. The consumer, unless he purposed to act as his own inspector, would then make a second

contract, supplementing the contract with the vendor, whereby some one would be appointed his agent for the purpose of making all necessary inspections and analyses, to see that the terms of the contract were carried out. And going a step further, the consumer and the vendor might agree to submit to some arbitrator, selected and paid by them, all differences of opinion concerning the quality of the milk furnished. In such an interlocking series of private contracts, you would have all of the elements of the present situation with respect to the milk supply; but every vendor and every consumer would have certain agreed standards of their own for the milk to be furnished, and each pair would have an inspector and a tribunal of its own for the adjustment of differences of opinion and to see that the agreement was carried out.

What the result would be, however, if the relations between each vendor and each purchaser of milk were worked out along the lines laid down in the preceding paragraph can be imagined better than described. Community action has, therefore, prevented such a situation by writing into law many of the elements of a supposedly model contract, so that they are embodied in each and every contract between the vendor and the purchaser of milk without any express agreement between them to that effect. The result is that when the consumer asks for milk, even though he specifies nothing more than the mere quantity, the law at once implies as elements of that contract every legal requirement with respect to the quality of the milk salable generally. Into that simple request there is injected through the force of the law the provision that the milk delivered shall have been subject to inspection by an inspector agreed upon by the vendor and the consumer and paid by them, through their agents, the legislative body and the duly constituted appointing officers. In it there is embodied the further provision that differences of opinion arising out of the terms of this contract may be settled by the courts of the land, either the civil courts for the trial of differences between individuals

generally, or the criminal courts, which are by the legislation constituted a special tribunal for the hearing and determination of these particular causes, or both. And instead of innumerable contracts, each possibly differing in some respect from all others, and instead of a multitude of private inspectors and of private tribunals, there is one standard contract, one corps of inspectors and one clearly defined system of tribunals for the adjudication of differences arising out of all such contracts. And in the system, the vendor still remains the agent of the purchaser; the inspector is the agent of the consumer, appointed in accordance with the terms the vendor agreed to, through his representatives, in the legislative body when the law was enacted, and the judge is the agent of both, appointed in accordance with their statutory agreement.

Complaint is sometimes made of alleged hardship that legislation regulating the production and sale of milk works upon the vendor, but just where the hardship comes in is not apparent so long as the legislation does not undertake to fix the price at which milk shall be sold, which, of course, in any event, it cannot do. For as against any hardship threatened by law, the vendor has the remedy of increasing the price and thus preventing any loss on his part. If there are circumstances that render increase of price difficult, and I know that I will be told that there are such circumstances, they do not arise out of the law but out of trade customs and trade competition, and the law is not responsible for them. The vendor has another remedy, too, for any threatened hardship, and that lies in legislative action; for the legislative body, as has been pointed out, is just as much the creature of the vendor of milk as of the consumer, of the chemist, or the bacteriologist, or the physician; and the vendor of milk, if he have a meritorious case, ought to be quite as able to induce the legislative body to act as is any other agency or faction to prevent action.

The situation of the vendor of milk with respect to this matter is far better in this respect than the situation of the milk

inspector and the judge. The inspector and the judge enter upon the discharge of their duties for fixed salaries and with stated duties. These duties are in many cases onerous and the salaries unduly small. Moreover, the duties may be made more onerous and the salary more inadequate by legislation enacted or conditions arising after the inspector and the judge have entered upon their work. But the only relief they have is through obtaining the enactment of remedial legislation or quitting their offices. They have not even the means of self-help open to the vendor of milk; they cannot increase the price charged for their services as the vendor can increase the price of the milk he sells. And so it is hoped that when the vendor of milk, be he producer or jobber, is commiserating with himself on the small returns on the capital and labor he invests in his business, he will shed an occasional tear for the inspector and the judge, who are really worse off and more helpless than he.

At the beginning of these remarks, the proposition was laid down that smoothness of operation in the system for the production of the milk supply, and proper quantity and quality of the output, required that the vendor of milk, the inspector, and the judge should each understand not only his own duty to the consumer of milk and to the community, but understand also the duties of the others. We may go a step further, and say that each should understand also the difficulties and the grievances that are incident to or arise out of the positions that the others hold with respect to this matter. For cooperation, to reach its highest efficiency among units so loosely correlated as are the vendor, inspector, and judge, must be based not only upon knowledge but also upon sympathy. Cooperation is a fair word to juggle with. Cooperation may or may not sound the keynote to success in our efforts to improve the milk supply. If it is cooperation for the welfare of the consumer alone, success will be assured; but if it is cooperation only for the aggrandizement of a class, then cooperation means fail-

ure. If it is discriminating cooperation, cooperation that refuses to cooperate whenever right and justice to the consumer forbid, then cooperation means progress. If it is cooperation that is blind to its effects on the baby who must drink milk and sees only the dollar that may find its way into some one's pocket, then cooperation is a curse. And no cooperation that is lasting or successful in so far as improving the milk supply is concerned can be established among milk inspectors, judges, and vendors of milk unless it be based on sound respect on the part of each group for both of the others.

*"Let us have faith that right makes might, and in that faith let us to the end dare to do our duty as we understand it."*

LINCOLN.





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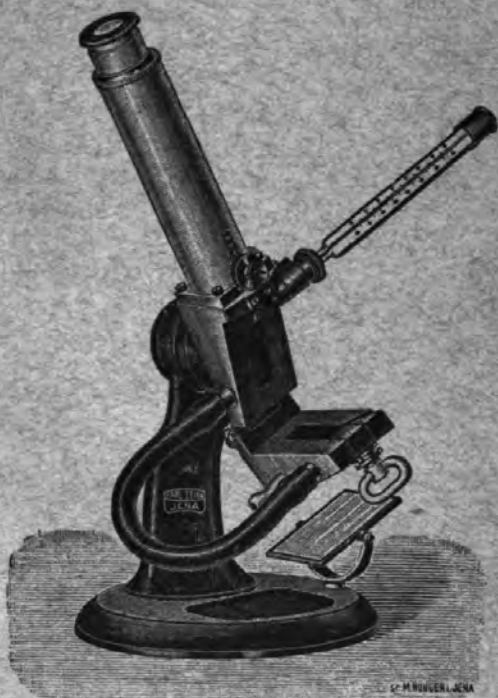
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