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REPORT OF THE COMMISSION ON MILK STANDARDS APPOINTED BY THE NEW YORK MILK COMMITTEE.

INTRODUCTION.

PERSONNEL.

The New York Milk Committee, which is a voluntary organization working in the interests of improving the milk supply of New York City, in March, 1911, decided to appoint a commission on milk standards. The men who have served on the commission are as follows:

Dr. W. A. Evans, professor preventive medicine, Northwestern University; health editor, Chicago Tribune, Chicago, Ill., chairman.

Dr. B. L. Arms, director of bacteriological laboratory, department of health, Boston, Mass.

Dr. John F. Anderson, director of hygienic laboratory, United States Public Health and Marine-Hospital Service, Washington, D. C.

Prof. H. W. Conn, director of bacteriological laboratory, Connecticut State Board of Health, department of biology, Wesleyan University, Middletown, Conn.

Dr. E. C. Levy, health officer, Richmond, Va.

Dr. A. D. Melvin, Chief of Bureau of Animal Industry, United States Department of Agriculture, Washington, D. C.

Dr. William H. Park, director of laboratories, department of health of New York City, foot of East Sixteenth Street, New York City.

Mr. Raymond A. Pearson, commissioner of agriculture, Albany, N. Y.

Dr. M. P. Ravenel, director of hygienic laboratory, University of Wisconsin, Madison, Wis.

Prof. M. J. Rosenau, department of hygiene and preventive medicine, Harvard Medical School, Boston, Mass.

Prof. Henry C. Sherman, department of chemistry, Columbia University, New York City.

Dr. A. H. Stewart, antitoxin laboratories, department of health and charities, Philadelphia, Pa.

Dr. William Royal Stokes, bacteriologist to State and city health departments, Baltimore, Md.

Prof. William A. Stocking, department of dairy industry, Cornell University, Ithaca, N. Y.

Mr. Chester H. Wells, health officer, Montclair, N. J.

Dr. L. L. Van Slyke, department of chemistry, New York Agricultural Experiment Station, Geneva, N. Y.

Dr. Charles E. North, consulting sanitarian, member New York Milk Committee, New York City, secretary.

ORIGIN AND ORGANIZATION.

The appointment of this commission was the direct result of the observation of the New York Milk Committee that there was great incompleteness and lack of uniformity in the milk standards, milk

ordinances, and rules and regulations of public-health authorities throughout the country for the control of public-milk supplies. There was a need that health officers be furnished conclusions drawn from large experience and mature judgment and that ordinances should be as free from erroneous positions and as uniform as possible.

A special committee of the New York Milk Committee was appointed to consider names of more than 200 men of prominence in medicine, sanitation, public health, and laboratory work, particularly those recognized as authorities on the milk question. Since regulations are based on standards and standards are based chiefly on laboratory analyses, the subcommittee selected 20 names of men distinguished for their knowledge of the bacteriological and chemical examination of milk and for the enforcement of standards based on such laboratory examinations. Two of those chosen declined to serve and another resigned after the first meeting, so that there were 17 members who have taken an active part in the work of the commission.

PURPOSES.

While this commission was created by and its expenses were borne by the New York Milk Committee, it has not been the intention of that committee that the commission should have the New York City milk problem solely in mind. It was desired that the commission should make recommendations that might be adopted by any city or town in the country.

MEETINGS.

The first meeting of the commission was held in the New York Academy of Medicine on May 22, 1911. The chief work of that meeting consisted in a general discussion of the scope of the commission's purpose and the appointment of a number of standing committees to which the several divisions of the work were assigned. The subjects included bacteriological standards, chemical standards, grades and classes of milk, standard ordinances, laws, and licenses, and new questions.

The second meeting of the commission was held at the New York Academy of Medicine on October 5 and 6, 1911, at which time the reports of the standing committees were received and modified, and the major part of them tentatively adopted. Special committees were appointed at this time to consider certain specific matters which were presented and final action on all matters was deferred until the third and final meeting.

The third and last meeting of the commission was held in Homer, N. Y., on January 25, and at the New York Academy of Medicine, January 26 and 27, 1912. The commission visited Homer in order that the members might inspect the central station and the dairy farms of the New York Dairy Demonstration Co. as a means of helping them to form a correct judgment of the relative value to be given to methods and equipment in the rules and regulations that they might recommend.

The commission voted to divide its report into a preamble of explanation and a report containing its resolutions regarding milk standards and rules and regulations.

PREAMBLE.

NEED OF MILK CONTROL.

Proper milk standards, while they are essential to efficient milk control by public health authorities and have as their object the protection of the milk consumer, are also necessary for the ultimate well-being of the milk industry itself. Public confidence is an asset of the highest value in the milk business. The milk producer is interested in proper standards for milk, since these contribute to the control of bovine tuberculosis and other cattle diseases and distinguish between the good producer and the bad producer. The milk dealer is immediately classified by milk standards, either into a seller of first-class milk or a seller of second-class milk, and such distinction gives to the seller of first-class milk the commercial rewards which he deserves, while it inflicts just penalties on the seller of second-class milk. For milk consumers, the setting of definite standards accompanied by proper labeling makes it possible to know the character of the milk which is purchased and to distinguish good milk from bad milk. In the matter of public health administration, standards are absolutely necessary to furnish definitions around which the rules and regulations of city health departments can be drawn, and the milk supply efficiently controlled.

PUBLIC HEALTH AUTHORITIES.

While public health authorities must necessarily see that the source of supply and the chemical composition should correspond with established definitions of milk as a food, their most important duty is to prevent the transmission of disease through milk. This means the control of infantile diarrhea, typhoid fever, tuberculosis, diphtheria, scarlet fever, septic throat infections, and other infectious diseases in so far as they are carried by milk.

SEPTIC SORE THROAT.

Septic sore throat deserves special mention because of the frequency in recent years with which outbreaks of this disease have been traced to milk supplies. The suggestion has been made that the infection of the milk is due to udder infection of the cow and on the other hand it has been suggested that it is due to contact with infected persons. The uncertainty can not be dispelled until cases of septic sore throat are regularly reported and tabulated by public health authorities. The commission therefore recommends that public health authorities make septic sore throat a reportable disease.

ECONOMIC PROBLEM.

The commission recognizes the magnitude of the milk industry, and that the improvement of milk supplies is primarily an economic problem. The success achieved by the experiment in milk production, which has been carried out on a very large scale by the New York Dairy Demonstration Co., is an illustration of the fact that an extra price or premium paid to the producer for cleanliness and care will

bring results far more quickly and certainly than instructions or official inspection. But while the basic problem is economic, and must eventually be solved by commerce, public health authorities must show the way and must establish standards and regulations in the interest of consumers, the value of which even the consumers themselves often fail to appreciate.

LEGAL REQUIREMENTS.

A prime requisite of effectiveness is that local milk laws shall not exceed sanitary limitations. The commission has not entered into a discussion of fundamental State laws, but it recommends that State laws be amended wherever necessary in order that every municipality may have the legal right to adopt whatever ordinances it sees fit for the improvement of the milk supply. The commission advocates that local health laws be carefully drawn with regard to their legality under the general laws of the localities to which they apply, since a decision against a milk law in one locality is liable to be used as a precedent against milk laws elsewhere.

STANDARD RULES AND REGULATIONS.

The commission has drawn up a set of standard rules and regulations for the control of milk. These are the result of a study of the printed rules and regulations of the cities of the United States and of foreign countries and represent an immense amount of work on the part of the special committee of the commission to which the task was assigned. Some communities are in a position to adopt all of these rules and regulations at the present time, while other communities will be obliged to adopt a few rules at a time as public sentiment and local conditions warrant. It is realized that some of the rules may have to be modified to meet local conditions. It seems wise to the commission to divide the regulations into two parts: First, requirements, under which head are set down those provisions which are so fundamentally necessary that no community is justified in compromising on them; second, recommendations, under which head are set down provisions which are necessary for a good milk supply, but on which there can be a certain amount of latitude for compromise by those communities in which public sentiment is not ready to support more than a moderate degree of protection of human life.

ADMINISTRATIVE EQUIPMENT.

Another prime requisite is that the administrative departments shall be adequately equipped with men, money, and laboratory facilities. In smaller communities cooperation between local boards of health to the extent of exchanging reports would eliminate much duplication. Where a community can not maintain a laboratory it can enter into laboratory arrangements with other communities, and several can combine in the use of a common laboratory. Much of the expense of tuberculin testing can be borne by the National and State Governments. The commission is of the opinion that results can not be expected from laws where there is not sufficient appropriation and

no machinery for their enforcement. On this subject the commission passed a resolution as follows:

Whereas the appropriations generally made for the purposes of carrying on laboratory analyses of milk are now in most cases entirely inadequate: Therefore be it

Resolved, That this commission recommends for the consideration of the authorities concerned an appropriation of funds commensurate with the importance of laboratory methods, which are of paramount importance in the hygienic control of the milk supply.

CLASSIFICATION OF MILKS.

There is no escape from the conclusion that milk must be graded and sold on grade, just as wheat, corn, cotton, beef, and other products are graded. The milk merchant must judge of the food value and also of the sanitary character of the commodity in which he deals. The high-grade product must get a better price than at present. The low-grade product must bring less. In separating milk into grades and classes the commission has endeavored to make its classification as simple as possible and at the same time to distinguish between milks which are essentially different in sanitary character.

In general two great classes of milk are recognized, namely, raw milk and pasteurized milk. Under these general classes there are different grades, as indicated in the report of the committee on classification.

PASTEURIZATION.

While the process of pasteurization is a matter which has attracted a great deal of attention in recent years, the commission has not entered into any discussion of its merits or demerits, but has given it recognition in its classification as a process necessary for the treatment of milk which is not otherwise protected against infection.

The commission thinks that pasteurization is necessary for all milk at all times excepting certified milk or its equivalent. The majority of the commissioners voted in favor of the pasteurization of all milk, including certified. Since this was not unanimous, the commission recommends that the pasteurization of certified milk be optional.

PASTEURIZING TEMPERATURES.

The destruction of the chemical constituents of milk by heat occurs at higher temperatures than those necessary for the destruction of the bacteria of infectious diseases transmissible by milk. (See chart in appendix.)

The commission passed a resolution regarding the temperature of pasteurization as follows:

That pasteurization of milk should be between the limits of 140° F. and 155° F. At 140° F. the minimum exposure should be 20 minutes. For every degree above 140° F. the time may be reduced by 1 minute. In no case should the exposure be for less than 5 minutes.

In order to allow a margin of safety under commercial conditions, the commission recommends that the minimum temperature during the period of holding should be made 145° F. and the holding time 20 minutes. Pasteurization in bulk when properly carried out has proven satisfactory, but pasteurization in the final container is preferable.

LABELING AND DATING OF MILK.

The commission voted that all milk should be labeled and marked with the grade in which it is to be sold. In dating milk uniform methods should be adopted for all grades of both raw milk and pasteurized milk, both using the day of the week or both using the day of the month. All milk should be dated uniformly with the date of delivery to the consumer. Raw milk should not be dated with the date of production while pasteurized milk is dated with the date of pasteurization, since this places certified milk at a disadvantage by making it possible for pasteurized milk of a lower grade to carry a later date. The stamping on the label of the day of the week is sufficient for dating.

BACTERIA.

The subject of bacteria in milk received more attention than any other matter brought before the commission. The commission recognizes that bacteria in milk in the majority of instances indicate dirt, or lack of refrigeration, or age, while in the minority of instances the bacteria of disease may be present. The routine laboratory methods for examining milk have as their purpose only the control over dirt, refrigeration, and age, and it is a rare thing for a laboratory to undertake the examination of milk for the bacteria of disease. Milk with a high bacterial count is not necessarily harmful, but when used as a food, particularly for children, is a hazard too great to be warranted. Milk with a high bacteria count, therefore, should be condemned. Milks with small numbers of bacteria are presumed to be wholesome, unless there is reasonable ground for suspecting that they have been exposed to contagion.

BACTERIAL STANDARDS.

The commission recognizes the difficulty in interpreting bacterial counts. At times misleading conclusions have been drawn from such counts. In establishing the bacterial standards for a city it is always necessary to take into consideration the necessary age of the milk and in lesser measure the distance hauled and methods employed in its hauling. It will always be possible for a community which consumes milk produced on its own premises, or within 12 hours of its production, to insist upon and maintain a lower bacterial standard than can one where the milk is hauled many miles into town in a wagon, to be consumed within 24 hours after it is produced. In like manner this second type of city can always maintain a lower bacterial standard than a city where the general milk supply is hauled by railroad long distances and is several days old when consumed. In drawing conclusions as to the relative efficacy of milk control in cities comparisons must be made between cities of the same class.

The commission deems it of the utmost importance that some standard method should be adopted for estimating and comparing the bacterial character of milks, since by this means only is it possible to grade and classify milks and to enforce bacterial standards. There is much diversity of opinion as to the best method of valuing bacterial counts. The average of a series gives results which are misleading about as frequently as otherwise. In the average a single high figure

may unduly overbalance a large number of exceedingly low counts. There are objections to the use of the "median" or middle number when the counts are arranged in order of size, for the reason that the middle figure does not distinguish between two groups in one of which there may be some very high counts above the median and in the other of which there are none. The method of dividing results into groups as recommended by the American Public Health Association, while a step in the right direction, is cumbersome and does not clearly indicate whether a milk conforms or not to a given bacterial standard. In this dilemma the commission has adopted some special methods of stating the results of bacterial counts. It recommends the use of a single figure, called "the bacterial content," as the means of determining whether a milk conforms to given bacterial standards and for determining the class to which milk belongs. These methods are described in detail in the appendix.

The bacterial standards given in the report are the work of a special committee of bacteriologists who considered all of the bacterial standards now in use. It is believed that the standards suggested are fair and wise and give full consideration to the state of the industry and of public-health control. The commission believes that the adoption and enforcement of these bacterial standards will be more effective than any other one thing in improving the sanitary character of public milk supplies. The enforcement of these standards can only be carried out by the regular and frequent laboratory examinations of milks for the numbers of bacteria they may contain.

CHEMICAL STANDARDS.

The chemical standards suggested are the work of a special committee, composed of chemists, which has carefully considered the natural composition of milk and the Federal and State standards already established. The standard of 3.25 per cent fat and 8.5 per cent solids, not fat, here proposed is in accordance with the recommendations of the Association of Official Agricultural Chemists and has been adopted by the United States Department of Agriculture and by a larger number of States than has any other standard. The simplification of the Babcock test makes the determination of fats and solids not fat an easy procedure quickly applied. Such chemical examinations of milk can be readily adopted and executed by any health board laboratory at a very moderate expense. It is believed that such chemical standards as are suggested will inflict no real hardship on the milk producers of this country and that the provision regarding substandard milks is a liberal one.

MICROSCOPIC EXAMINATION OF MILK.

Some of the special methods of milk examination recently devised having as their object the determination of the numbers of bacteria directly by the use of the microscope, the presence of pus by sedimentation and microscopical examination, and the presence of gross dirt by filtration were deemed of such importance that the subjects were assigned to a special committee. The committee has made extensive studies of these methods, which are the subject of a special report. (See appendix.)

PUBLICITY.

The commission fully considered the matter of the publication of laboratory examinations of milk by city and town health authorities. When proper standards and regulations are established and adequate facilities furnished for laboratory work, it is believed that the laboratory tests will give an index of the character of the milk delivered to the public by milk sellers which is entirely fair and impartial. There can be no objection to publicity under such circumstances. It is an advantage to the seller of high-grade milk. It is an advantage to the consumer who desires to select a high-grade milk. It has much educational value both to producer and consumer. Therefore the commission recommends "that the reports of laboratory analyses of milk made by departments of health be regularly published."

REPORT.

CLASSIFICATION OF MILK.

Milk should be graded and classified. The classification should be the same for both large and small cities and towns. Milk should be graded into four classes, as follows:

Class A.—Certified milk or its equivalent.

Class B.—Inspected milk.

Class C.—Pasteurized milk.

Class D.—Milk not suitable for drinking purposes.

CLASS A. *Certified milk or its equivalent.*—The use of the term certified should be limited to milk produced in conformity with the requirements of the American Association of Certified Milk Commissions.

Milk of an equivalent character should conform to the following requirements: It should be produced at dairies subjected to periodic inspection and the products of which are subject to frequent analyses. The cows producing such milk must be properly fed and watered, free from tuberculosis as shown by the tuberculin test and physical examination by a qualified veterinarian, and from all other communicable diseases, and from diseases and conditions whatsoever likely to deteriorate the milk. They must be housed in clean, properly ventilated stables of sanitary construction, and must be kept clean. All persons who come in contact with the milk must exercise scrupulous cleanliness and must not harbor the germs of typhoid fever, tuberculosis, diphtheria, dysentery, scarlet fever, and septic throat infections, or other infections liable to be conveyed by the milk. Milk must be drawn under all precautions necessary to avoid infection, and be immediately strained and cooled, placed in sterilized bottles, and kept at a temperature not exceeding 50° F. until delivered to the consumer. Pure water, as determined by inspection and chemical and bacteriological examination, is to be provided for use throughout the dairy farm and dairy. Milk of this class should contain less than 10,000 bacteria per cubic centimeter, and should not be more than 28 hours old when delivered.

CLASS B. *Inspected milk.*—This class should consist of clean raw milk from healthy cows, as determined by the tuberculin test and physical examination by a qualified veterinarian, and from dairies

that score not less than 70 on the Government score card. The cows are to be fed, watered, housed, and milked under good conditions, but not necessarily equal to the conditions prescribed for class A. All persons who come in contact with the milk must exercise scrupulous cleanliness and must not harbor the germs of typhoid fever, tuberculosis, diphtheria, or other infectious diseases liable to be conveyed by milk. This milk is to be delivered in sterilized containers and is to be kept at a temperature not exceeding 50° F. until it reaches the consumer. It should contain less than 100,000 bacteria per cubic centimeters. Pasteurization of milk of this class is optional. If pasteurized it shall then be designated as "pasteurized inspected milk."

CLASS C. *Pasteurized milk.*—Milk from dairies not able to comply with the requirements specified for classes A and B should be pasteurized under official supervision before being sold, and should be sold under the designation "pasteurized milk." Milk for pasteurization should be kept at a temperature not exceeding 50° F. at all times while in transit from the dairy farm to the pasteurizing plant. After pasteurization it should be placed in sterilized containers (if not pasteurized in such containers) and should be cooled at once to 50° F. and kept below that temperature until delivered to the consumer. No cows in any way unfit for the production of milk for use by man, as determined by physical examination, shall be permitted to remain in any dairy producing milk of class C. Such milk before pasteurization should contain less than 1,000,000 bacteria per cubic centimeter, and after pasteurization less than 50,000, and it should not contain colon bacilli in 1 cubic centimeter as determined by cultural methods. Pasteurized milk should be delivered to the consumer within less than 48 hours after pasteurization. The repasteurization of milk should be prohibited.

CLASS D. *Milk not suitable for drinking purposes.*—Milk containing over 1,000,000 bacteria per cubic centimeter, or from farms scoring less than 40 per cent, may be allowed to be sold for cooking and industrial purposes only after having been pasteurized or heated to a higher temperature. Such milk should be delivered in a distinctive container, and should not be allowed to be sold for drinking purposes.

CLASSIFICATION OF CREAM.

Cream should be classified into the same grades as milk, in accordance with the requirements for the grades of milk, with special bacterial standards which should not exceed 30,000 per cubic centimeter in the case of grade A, and 300,000 per cubic centimeter in the case of grade B. Bacterial limits for grades C and D can not at the present time be specified.

BACTERIOLOGICAL STANDARDS.

Class A milk shall contain less than 10,000 bacteria per cubic centimeter.

Class B milk shall contain less than 100,000 bacteria per cubic centimeter.

Class C milk shall contain less than 1,000,000 bacteria per cubic centimeter before pasteurization and less than 50,000 bacteria per

cubic centimeter after pasteurization, and should not contain colon bacilli in 1 cubic centimeter as determined by cultural methods.

On the subject of laboratory examinations of milk for bacteria, the commission passed the following resolutions:

1. That the interests of public health demand that the control of milk supplies shall include regular laboratory examinations of milk by bacteriological methods.
2. That among present available routine laboratory methods for determining the sanitary quality of milk the bacteria count occupies first place.
3. That bacteriological standards should be a factor in classifying or grading milks of different degrees of excellence.
4. That bacteriological examinations of milk are of importance at every stage of production and distribution, but that in the establishment of grades and classes of raw milk such grades and classes should be based on the bacterial content of milk as offered for sale.
5. That there should be bacteriological standards for milk before it is pasteurized and for milk after it is pasteurized.
6. That the bacteria count of milk indicates its quality and history as it is modified by unusual contamination, improper handling, dirt, improper refrigeration, or age. The high count indicates the necessity of investigation and inspection in order that remedies may be applied.
7. That there be adopted as standards for making the bacteria count the standard methods of the American Public Health Association, laboratory section, recommending, however, the following amendments:
 - A. The methods of taking samples for laboratory tests for bacterial counts should be the same and uniform for all grades and classes of milk.
 - B. That 1½ per cent agar be used instead of 1 per cent agar.
 - C. That incubation of plate cultures be made at 37° C. for 48 hours, and that there be no option.
 - D. That the minimum number of bacteria tests of milk necessary to warrant the publication of results be made four consecutive bacteria counts of separate samples within a period of not more than four weeks.

CHEMICAL STANDARDS.

Cow's milk.—Standard milk should contain not less than 8.5 per cent of milk solids not fat and not less than 3.25 per cent of milk fat.

Skim milk.—Standard skim milk should contain not less than 8.75 per cent of milk solids.

Cream.—Standard cream contains not less than 18 per cent of milk fat and is free from all constituents foreign to normal milk. The percentage of milk fat in cream over or under that standard should be stated on the label.

Buttermilk.—Buttermilk is the product that remains when fat is removed from milk or cream, sweet or sour, in the process of churning. Standard buttermilk contains not less than 8.5 per cent of milk solids. When milk is skimmed, soured, or treated so as to resemble buttermilk, it should be known by some distinctive name.

HOMOGENIZED MILK OR CREAM.

The commission is of the opinion that in the compounding of milk no fats other than milk fats from the milk in process should be used and that no substance foreign to milk should be added to it. The commission is opposed to the use of condensed milk or other materials for the thickening of cream unless the facts are clearly set forth on the label of the retail package. Regarding the process of homogenizing the commission resolved as follows:

That homogenized milk or cream should be so marked, stating the percentage of fat that it contains.

ADJUSTED MILKS.

On the question of milks and creams in which the ratio of the fats to the solids not fat has been changed by the addition to or subtraction of cream or milk fat the commission has hesitated to take a position. On the one hand they are in favor of every procedure which will increase the market for good milk and make the most profitable use of every portion of it. On the other, they recognize the sensitiveness of milk, the ease with which it is contaminated, and the difficulty of controlling, standardizing, skimming, homogenizing, souring, etc., so that contaminations do not occur and inferior materials are not used. On this subject the commission passed a resolution presented by a special committee as follows:

Milk in which the ratio of the fats to the solids not fat has been changed by the addition to or subtraction of cream should be labeled "adjusted milk;" the label should show the minimum guaranteed percentage of fat and should comply with the same sanitary or chemical requirements as for milk not so standardized or modified.

REGULATION OF MARKET MILK ON BASIS OF GUARANTEED PERCENTAGE COMPOSITION.

1. Sellers of milk should be permitted choice of one of two systems in handling market milk. Milk can be sold, first, under the regular standard, or, second, under a guaranteed statement of composition.

2. Any normal milk may be sold if its per cent of fat is stated. In case the per cent of fat is not stated, the sale will be regarded as a violation unless the milk contains at least 3.25 per cent of milk fat.

3. As a further protection to consumers, it is desirable that when the guaranty system is used there be also a minimum guaranty of milk solids not fat of not less than 8.5 per cent.

4. Dealers electing to sell milk under the guaranty system should be required to state conspicuously the guaranty on all containers in which such milk is handled by the dealer or delivered to the consumer.

5. The sale of milk on a guaranty system should be by special permission obtained from some proper local authority.

STANDARD RULES FOR THE PRODUCTION, HANDLING, AND DISTRIBUTION OF MILK.

As a basis for the promulgation of rules and recommendations governing the production, handling, and distribution of milk, it is recognized that we have to deal with two kinds of milk, raw and pasteurized, although there may be several grades of each of these two kinds. In order for any grade to be safe, it is recommended that the regulations herein set forth under the heading "Requirements" should be enforced. The regulations herein set forth under the heading "Recommendations" should be adopted wherever practicable as a means of improving the milk supply above the actual point of safety. (The term "milk" shall be construed to include the fluid derivatives of milk wherever such construction of the term is applicable.)

LICENSES.**REQUIREMENTS.**

No person shall engage in the sale, handling, or distribution of milk in _____ until he has obtained a license therefor from the health authorities. This license shall be renewed on or before the 1st day of _____ of each year and may be suspended or revoked at any time for cause.

RECOMMENDATIONS.

The application for the license shall include the following statements:

- (1) Kind of milk to be handled or sold.
- (2) Names of producers with their addresses and permit numbers.
- (3) Names of middlemen with their addresses.
- (4) Names and addresses of all stores, hotels, factories, and restaurants at which milk is delivered.
- (5) A statement of the approximate number of quarts of milk, cream, buttermilk, and skim milk sold per day.
- (6) Source of water supply at farms and bottling plants.
- (7) Permission to inspect all local and out-of-town premises on which milk is produced and handled.
- (8) Agreement to abide by all the provisions of State and local regulations.

PERMITS.**REQUIREMENTS.**

No person shall engage in the production of milk for sale in _____, nor shall any person engage in the handling of milk for shipment into _____ until he has obtained a permit therefor from the health authorities. This permit shall be renewed on or before the 1st day of _____ of each year and may be suspended or revoked at any time for cause.

Raw Milk.**COW STABLES.****REQUIREMENTS.**

1. They shall be used for no other purpose than for the keeping of cows, and shall be light, well ventilated, and clean.
2. They shall be ceiled overhead if there is a loft above.
3. The floors shall be tight and sound.
4. The gutters shall be water-tight.

RECOMMENDATIONS.

1. The window area shall be at least 2 square feet per 500 cubic feet of air space and shall be uniformly distributed, if possible. If uniform distribution is impossible, sufficient additional window area must be provided so that all portions of the barn shall be adequately lighted.
2. The amount of air space shall be at least 500 cubic feet per cow, and adequate ventilation besides windows shall be provided.
3. The walls and ceilings shall be whitewashed at least once every six months, unless the construction renders it unnecessary, and shall be kept free from cobwebs and dirt.
4. All manure shall be removed at least twice daily and disposed of so as not to be a source of danger to the milk either as furnishing a breeding place for flies or otherwise.
5. Horse manure shall not be used in the cow stable for any purpose.

MILK ROOM.**REQUIREMENTS.**

Every milk farm shall be provided with a milk room that is clean, light, and well screened. It shall be used for no other purpose than for the cooling, bottling, and storage of milk and the operations incident thereto.

RECOMMENDATIONS.

1. It shall have no direct connection with any stable or dwelling.
2. The floors shall be of cement or other impervious material, properly graded and drained.
3. It shall be provided with a sterilizer unless the milk is sent to a bottling plant, in which case the cans shall be sterilized at the plant.
4. Cooling and storage tanks shall be drained and cleaned at least twice each week.
5. All drains shall discharge at least 100 feet from any milk house or cow stable.

COWS.**REQUIREMENTS.**

1. A physical examination of all cows shall be made at least once every six months by a veterinarian approved by the health authorities.
2. Every diseased cow shall be removed from the herd at once and no milk from such cows shall be offered for sale.
3. The tuberculin test shall be applied at least once a year by a veterinarian approved by the health authorities.
4. All cows which react shall be removed from the herd at once, and no milk from such cows shall be sold as raw milk.
5. No new cows shall be added to a herd until they have passed a physical examination and the tuberculin test.
6. Cows, especially the udders, shall be clean at the time of milking.
7. No milk that is obtained from a cow within 15 days before or 5 days after parturition, nor any milk that has an unnatural odor or appearance, shall be sold.
8. No unwholesome food shall be used.

RECOMMENDATIONS.

1. Every producer shall allow a veterinarian employed by the health authorities to examine his herd at any time under the penalty of having his supply excluded.
2. Certificates showing the results of all examinations shall be filed with the health authorities within 10 days of such examinations.
3. The tuberculin tests shall be applied at least once every six months by a veterinarian approved by the health authorities, unless on the last previous test no tuberculosis was present in the herd or in the herds from which new cows were obtained, in which event the test may be postponed an additional six months.
4. Charts showing the results of all tuberculin tests shall be filed with the health authorities within 10 days of the date of such test.
5. The udders shall be washed and wiped before milking.

EMPLOYEES.**REQUIREMENTS.**

1. All employees connected in any way with the production and handling of milk shall be personally clean and shall wear clean outer garments.
2. The health authorities shall be notified at once of any communicable disease in any person that is in any way connected with the

production or handling of milk, or of the exposure of such person to any communicable disease.

3. Milking shall be done only with dry hands.

RECOMMENDATIONS.

1. Clean suits shall be put on immediately before milking.
2. The hands shall be washed immediately before milking each cow, in order to avoid conveyance of infection to the milk.

UTENSILS.

REQUIREMENTS.

1. All utensils and apparatus with which milk comes in contact shall be thoroughly washed and sterilized, and no milk utensil or apparatus shall be used for any other purpose than that for which it was designed.
2. The owner's name, license number, or other identification mark, the nature of which shall be made known to the health authorities, shall appear in a conspicuous place on every milk container.
3. No bottle or can shall be removed from a house in which there is, or in which there has recently been, a case of communicable disease until permission in writing has been granted by the health authorities.
4. All metal containers and piping shall be in good condition at all times. All piping shall be sanitary milk piping, in couples short enough to be taken apart and cleaned with a brush.
5. Small-top milking pails shall be used.

RECOMMENDATIONS.

1. All cans and bottles shall be cleaned as soon as possible after being emptied.
2. Every conveyance used for the transportation or delivery of milk, public carriers excepted, shall bear the owner's name, milk-license number, and business address in uncondensed gothic characters at least 2 inches in height.

MILK.

REQUIREMENTS.

1. It shall not be strained in the cow stable, but shall be removed to the milk room as soon as it is drawn from the cow.
2. It shall be cooled to 50° F. or below within two hours after it is drawn from the cow and it shall be kept cold until it is delivered to the consumer.
3. It shall not be adulterated by the addition to or the subtraction of any substance or compound, except for the production of the fluid derivatives allowed by law.
4. It shall not be tested by taste at any bottling plant, milk house, or other place in any way that may render it liable to contamination.
5. It shall be bottled only in a milk room or bottling plant for which a license or permit has been issued.
6. It shall be delivered in bottles, or single service containers, with the exception that 20 quarts or more may be delivered in bulk in the following cases:

(a) To establishments in which milk is to be consumed or used on the premises.

(b) To infant-feeding stations that are under competent medical supervision.

7. It shall not be stored in or sold from a living room or from any other place which might render it liable to contamination.

RECOMMENDATIONS.

1. It shall be cooled to 50° F. or below immediately after milking and shall be kept at or below that temperature until it is delivered to the consumer.

2. It shall contain no visible foreign material.

3. It shall be labeled with the date of production.

RECEIVING STATIONS AND BOTTLING PLANTS.

REQUIREMENTS.

1. They shall be clean, well screened, and lighted, and shall be used for no other purpose than the proper handling of milk and the operations incident thereto, and shall be open to inspection by the health authorities at any time.

2. They shall have smooth, impervious floors, properly graded and drained.

3. They shall be equipped with hot and cold water and steam.

4. Ample provision shall be made for steam sterilization of all utensils, and no empty milk containers shall be sent out until after such sterilization.

5. All utensils, piping, and tanks shall be kept clean and shall be sterilized daily.

RECOMMENDATIONS.

1. Containers and utensils shall not be washed in the same room in which milk is handled.

STORES.

REQUIREMENTS.

1. All stores in which milk is handled shall be provided with a suitable room or compartment in which the milk shall be kept. Said compartment shall be clean and shall be so arranged that the milk will not be liable to contamination of any kind.

2. Milk shall be kept at a temperature not exceeding 50° F.

RECOMMENDATIONS.

1. Milk to be consumed off the premises may be sold from stores only in the original unopened package.

GENERAL REGULATIONS.

REQUIREMENTS.

1. The United States Bureau of Animal Industry score card shall be used, and no milk from a dairy that scores below 70 on such card shall be sold.

2. Every place where milk is produced or handled and every conveyance used for the transportation of milk shall be clean.

3. All water supplies shall be from uncontaminated sources and from sources not liable to become contaminated.

4. The license or permit shall be kept posted in a conspicuous place in every establishment for the operation of which a milk license or permit is required.

5. No milk license or permit shall at any time be used by any person other than the one to whom it was granted.

6. No place for the operation of which a license or permit is granted shall be located within 100 feet of a privy or other possible source of contamination, nor shall it contain or open into a room which contains a water-closet.

7. No skim milk or buttermilk shall be stored in or sold from cans or other containers unless such containers are of a distinctive color and permanently and conspicuously labeled "skim milk" or "buttermilk," as the case may be.

8. No container shall be used for any other purpose than that for which it is labeled.

RECOMMENDATIONS.

1. Ice used for cooling purposes shall be clean and uncontaminated.
2. No person whose presence is not required shall be permitted to remain in any cow stable, milk house, or bottling room.

SUBNORMAL MILK.

REQUIREMENTS.

1. Natural milk that contains less than 3.25 per cent, but more than 2.5 per cent milk fat, and that complies in all other respects with the requirements above set forth, may be sold, provided the percentage of fat does not fall below a definite percentage that is stated in a conspicuous manner on the container; and further provided that such container is conspicuously marked "substandard milk."

CREAM.

REQUIREMENTS AND RECOMMENDATIONS.

1. It shall be obtained from milk that is produced and handled in accordance with the provisions hereinbefore set forth for the production and handling of milk.

STANDARDS FOR MILK.

REQUIREMENTS.

1. It shall not contain more than 100,000 bacteria per cubic centimeter.
2. It shall contain not less than 3.25 per cent milk fat.
3. It shall contain not less than 8.5 per cent solids not fat.

RECOMMENDATIONS.

1. The bacterial limit shall be lowered if possible.

STANDARDS FOR CREAM.**REQUIREMENTS.**

1. It shall not contain more than 300,000 bacteria per cubic centimeter.
2. It shall contain not less than 18 per cent milk fat.

RECOMMENDATIONS.

Same as above for milk.

STANDARDS FOR SKIM MILK.**REQUIREMENTS.**

1. It shall contain not less than 8.75 per cent milk solids.
2. Control of sale of skim milk: Whether skim milk is sold in wagons or in stores, all containers holding skim milk should be painted some bright, distinctive color and prominently and legibly marked "skim milk." When skim milk is placed in the buyer's container, a label or tag bearing the words "skim milk" should be attached.

PASTEURIZED MILK.

Pasteurized milk is milk that is heated to a temperature of not less than 140° F. for not less than 20 minutes, or not over 155° F. for not less than 5 minutes, and for each degree of temperature over 140° F. the length of time may be 1 minute less than 20. Said milk shall be cooled immediately to 50° F. or below and kept at or below that temperature.

COW STABLES.**REQUIREMENTS.**

The same as for the production of raw milk.

RECOMMENDATIONS.

The same as for the production of raw milk.

MILK ROOM.**REQUIREMENTS.**

The same as for the production of raw milk.

RECOMMENDATIONS.

The same as for the production of raw milk.

COWS.**REQUIREMENTS.**

The same as for the production of raw milk, with the exception of the sections relating to the tuberculin test.

RECOMMENDATIONS.

That no cows be added to a herd excepting those found to be free from tuberculosis by the tuberculin test.

EMPLOYEES.

REQUIREMENTS.

The same as for the production of raw milk.

RECOMMENDATIONS.

The same as for the production of raw milk.

UTENSILS.

REQUIREMENTS.

The same as for the production of raw milk.

RECOMMENDATIONS.

The same as for the production of raw milk.

MILK FOR PASTEURIZATION.

REQUIREMENTS.

1. The same as for the production of raw milk, with the exception of sections 1, 2, and 6b.

2. It shall be cooled to 60° F. or below within two hours after it is drawn from the cow, and it shall be held at or below that temperature until it is pasteurized. After pasteurization, it shall be held at a temperature not exceeding 50° F. until delivered to the consumer.

3. Pasteurized milk shall be distinctly labeled as such, together with the temperature at which it is pasteurized, and the shortest length of exposure to that temperature and the date of pasteurization.

RECOMMENDATIONS.

1. No milk shall be repasteurized.

2. The requirements governing the production and handling of milk for pasteurization should be raised wherever practicable.

PASTEURIZING PLANTS.

REQUIREMENTS.

The same as under "Receiving stations and bottling plants" for raw milk.

RECOMMENDATIONS.

The same as under "Receiving stations and bottling plants" for raw milk.

STORES.

REQUIREMENTS.

The same as for raw milk.

RECOMMENDATIONS.

The same as for raw milk.

GENERAL REGULATIONS.

REQUIREMENTS.

1. The same as for raw milk with the exception that the minimum dairy score shall be 40, and no milk from a dairy that scores below 40 shall be pasteurized for sale, except for industrial purposes.

2. Milk from cows that have been rejected by the tuberculin test, but which show no physical signs of tuberculosis, as well as those which have not been tested, may be sold provided that it is produced and handled in accordance with all the other requirements herein set forth for pasteurized milk.

3. Ice used for cooling purposes shall be clean.

RECOMMENDATIONS.

The same as for raw milk.

PASTEURIZED CREAM.

REQUIREMENTS.

1. It shall be obtained only from milk that could legally be sold as milk under the requirements hereinbefore set forth.

2. Pasteurized cream, or cream separated from pasteurized milk, shall be labeled in the manner herein provided for the labeling of pasteurized milk.

STANDARDS FOR PASTEURIZED MILK.

REQUIREMENTS.

1. It shall not contain more than 1,000,000 bacteria per cubic centimeter before pasteurization, nor over 50,000 when delivered to the consumer, and no colon bacilli in 1 cubic centimeter as determined by cultural methods.

2. The standards for the percentage of milk fat and of total solids shall be the same as for raw milk.

RECOMMENDATIONS.

1. The limits for the bacterial count before pasteurization and after pasteurization should both be lowered if possible.

STANDARDS FOR PASTEURIZED CREAM.

REQUIREMENTS.

1. No cream shall be sold that is obtained from pasteurized milk that could not be legally sold under the provisions herein set forth, nor shall any cream that is pasteurized after separation contain an excessive number of bacteria.

2. The bacterial count of pasteurized cream shall not exceed 100,000 bacteria per cubic centimeter when delivered to the consumer.

3. The percentage of milk fat shall be the same as for raw cream.

Penalty.

Every milk ordinance should contain a penalty clause.

APPENDIX.**REPORT OF THE COMMITTEE UPON THE MICROSCOPIC EXAMINATION OF MILK AND UPON THE DETERMINATION OF THE DIRT IN MILK.**

Inasmuch as the subjects referred to this committee are in some respects new to some members of the commission, the report of this committee is presented in two parts. In the first part are given the important facts concerning the method and the utility of a microscopic examination of milk, and in the second part are presented a few resolutions for consideration by the committee. The data upon which this report is based is partly derived from special work by members of the committee and partly from correspondence and published papers. Letters have been addressed to all laboratories where these methods have been in use, so far as the addresses could be obtained, and from the replies received the following conclusion has been reached:

1. The microscopic examination of raw milk has been somewhat widely adopted, but apparently only in a few places has it been extensively used. In at least two laboratories where it has been tried, it has been given up as unreliable; but in general those who have used the method most are most enthusiastic as to its value.

2. There are two different methods of making a microscopic examination of milk:

- (a) The use of centrifugal machine by the Stewart-Slack method. This method involves the centrifugalization of 1 or 2 cubic centimeters of milk and smearing of the sediment upon a slide, subsequently staining the same, and is so well known that it is unnecessary to describe it in detail here. It is the method that has been most commonly used. The results of this method vary considerably with details of individual manipulation, with the speed of the centrifugal machine, with the time allowed for centrifugalization, and with other individual factors. As a result, findings of one laboratory can not be commonly compared accurately with those of another, but they are fairly uniform when compared with each other.

- (b) The direct examination of milk by the Prescott-Breed method. The details of this method are found in the *Cent. f. Bact.* 11, XXX, p. 337, 1911, but since it is somewhat new a brief description of it will be here given. A capillary tube is prepared, arranged to receive a rubber bulb at one end and marked carefully to deliver one one-hundredth of a cubic centimeter. After a most thorough mixing of the milk, one one-hundredth of a cubic centimeter is removed with the sterilized pipette and spread uniformly over a square centimeter on an ordinary microscopic slide. It is allowed to dry and is fixed with methyl alcohol, after which the fat is dissolved from it by the use of xylol. The smear is then stained either with methylene blue or preferably with one of the blood stains, the Jenner stain or Wright stain being useful for this purpose. If the staining is so deep as to make the specimen too opaque for proper study, it is slightly decolorized with alcohol which removes the stain from the general sediment more readily than it does from the bacteria or the tissue cells. The stained smear is studied under a twelve-inch immersion. The draw tube of the immersion is adjusted so that the field of the microscope covers exactly 15 millimeters and under these circumstances the number of bacteria present in the one one-hundredth of a cubic

centimeter is exactly 5,000 times the number found in a microscopic field. The counting of a large number of fields (100 fields) and averaging the results multiplied by this number will therefore give approximately the number of cells or bacteria contained in a one one-hundredth cubic centimeter of milk.

This method has the advantage of eliminating all of the errors that are associated with the irregularity in the action of the centrifugal machine and many of the other individual errors connected with the Stewart-Slack method. On the other hand, it has the disadvantage of examining only a small quantity of milk, one one-hundredth of a cubic centimeter being hardly a fair sample. This disadvantage, however, may be met by making a very thorough mixture of the milk before sampling and by making the examination in duplicate. A second disadvantage is the large multiplier that has to be used to reduce the results to 1 cubic centimeter. This, of course, very greatly increases any error that may appear in the observation and introduces an error the extent of which can not yet be stated accurately. It may in a measure be met by making the examination in duplicate and by averaging a large number of plate counts.

3. The chief advantages derived from the microscopic examination of milk are due to the quickness of the method:

(a) It makes possible the rapid discarding of poor samples of milk, since reports upon it are possible within a very short time.

(b) The quickness with which an examination can be made makes it possible for a single laboratory to examine many more samples of milk than by the older plate method, one person being able to examine and report upon 50 to 100 samples in a half day, and to make the reports upon the same day that the milk is collected.

4. The microscopic study of milk gives information upon the following points:

(a) The abundance of cells which are present in the milk.

(b) The clumping of these cells, which is frequently noticeable in the centrifugal slime but which is rarely if ever seen in milk that is examined by the direct method above mentioned.

(c) The bacterial count.

(d) The presence of chain-forming streptococci (in this report when the term streptococci is used, reference is made to chain-forming organisms with at least six elements in a chain).

(e) General information concerning the nature of the dirt and the source of the bacteria in the milk. With a little experience one can distinguish certain types of bacteria which comes from farm dirt from those that come from unclean vessels.

5. The estimation of the number of bacteria in milk by microscopic study has the following advantages and disadvantages:

(a) It is of no value when the number of bacteria in the milk is low.

(b) The microscopic examination gives numbers of bacteria vastly higher than those given by the plate method. (In a series of 20 comparative tests by one member of the committee there was found an average of 5,000 bacteria by the plate method, 700,000 bacteria by the Stewart-Slack method, and 5,000,000 bacteria by the Prescott-Breed method of microscopic examination.)

(c) In determining the total number of bacteria in milk the microscopic examination is far more accurate than the plate method, since it gives practically all of the bacteria present, while the plate method gives only those that grow in special media under special

conditions. The microscope, however, fails to distinguish between living and dead bacteria.

(d) The Stewart-Slack method of examining milk is of great practical use in those cities which have a bacterial standard of 500,000, since it quickly detects milk which contains bacteria more than this limit without the necessity of making plate count. For samples that contain about 500,000 or less it is necessary to make a plate count in order that the result may be reliable.

(e) The data at hand are as yet insufficient to determine the factor by which the milk could be condemned by the Prescott-Breed method. Data at present at hand would seem to indicate that nearly all samples of milk would approach or surpass this limit of 500,000 when the bacteria are determined by the direct method of examination of Prescott-Breed.

(f) No constant ratio can be found between the number of bacteria disclosed by the microscope and the number found by the plate count. There is a general parallel but with many irregularities.

6. No method has yet been accepted for accurately distinguishing between the pus cells and other cells that may be in the milk that do not have an origin in inflammatory conditions. Some regard all noticeably clumped cells as indicating pus, stating that upon proper incubation, all such clumpings may be found to be accompanied by chain-forming streptococci. Others regard all polymorpho-nuclear neutrophilic cells as pus. Most, however, at the present time fail to recognize any method of clearly distinguishing pus from tissue cells.

7. A general consensus of opinion has been reached that a high cell count should not alone condemn milk, although it is a matter for suspicion. The cell count varies with the same cow upon different days and it may be increased by simply manipulating the udders. Some believe that clumped cells always indicate an inflammatory condition.

8. A high cell count accompanied by streptococci apparently always indicates udder troubles. In many cases these have been followed up to the dairy, and where this has been done it is almost always possible to find the source in some cow suffering from some trouble in its udders.

9. More data is needed before it can be definitely stated whether ill health in children can be traced to milk that would be condemned by the microscope, although this has apparently been done in some cases.

10. At the present time, it is impossible to agree upon any standard for condemning milk by cell count beyond the general rule that a high cell count accompanied by streptococci indicates an inflammatory condition or otherwise diseased udders.

11. Where the source of the milk is known, microscopic method of study is of great value in picking out animals with diseased udders. It is of a special help in directing attention to a herd that needs inspection, and has been extensively and satisfactorily used in this way. In market milk, it is of great value where the source of the milk is known and can be reached, and its chief value is in finding the location of troubles rather than in condemning milk.

12. Concerning the value of the microscopic examination of milk, there are wide differences of opinion among those who have been using it. A few regard it as of little value and have discarded it entirely. Some have thought it of some value, but much less than

the bacteriological plate count. Others regard it of more value than the plate count; and some have looked upon it as of so much value as to lead them to substitute it for the older method of bacteriological examination by plates, this latter method of examining having been quite abandoned. The claim is made in these cases that it gives better and quicker results and has been found of practical value in controlling the milk supply by pointing out the sources of trouble. All who have used this method recognize that it gives valuable data.

13. Concerning the dirt test, the committee would make the following statement: Of the several methods of determining the presence of dirt in milk the committee believe that the most valuable is that of filtering it through a cotton disk. This committee would suggest that a standard disk of an inch in diameter be selected for the filtering of a quart of milk, and proportionate-sized disk for smaller amounts of milk. The Lorenze apparatus is a convenient filter for filtering milk through a cotton disk; but various other types than that distinctly known by this name are equally satisfactory. A Gooch crucible may be used conveniently or any other device in which the cotton disk is supported upon a gauze and in such position that milk can be readily filtered through it. To be most efficient, the cotton disk should be subsequently dried and sent to the individual dairyman.

In order to have the best results, the most desirable plan is to do the filtering in the dairy immediately after milking. For this purpose batteries of filters are needed, and these must be warmed in cold weather in order that milk should pass through them readily. If these are used in the dairy, the results thus demonstrated to the dairyman are very convincing. The test is quick and simple and is proving very useful in locating unclean methods. It is much less cumbersome than the somewhat more expensive method of measuring the amount of dirt, and although it does not give a quantitative, but only comparative result, it is as useful for the purpose of detecting and remedying unclean conditions as the more slow and more expensive quantitative methods.

From these data the committee would present the following recommendations:

RECOMMENDATIONS.

1. The direct microscopical examination of raw milk gives very valuable information, since it presents in a few moments a graphic picture of the bacterial content as well as the number of cells and offers a prompt method of excluding some samples of milk which are manifestly unfit for use, doing this promptly. To give the most valuable results, the committee would recommend the use of some good blood stain like the Jenner or the Wright stain.

2. Because of the irregularities in methods and results, no standard can yet be given for grading milk by the microscopic examination. Special attention is recommended to the presence of polymorphonuclear neutrophilic cells. A high cell count alone is not sufficient to condemn milk, but if accompanied by chain-forming streptococci it is an indication of udder troubles. The presence of streptococci alone is also sufficient to suggest the same conclusion. The microscopic examination is therefore of great use in picking out animals with diseased udders for the purpose of removing them from the dairy herd after a proper examination of individual cows.

3. The data as yet accumulated are insufficient to determine whether the examination of milk by the centrifugal method of the Stewart-Slack type or the direct examination by the Prescott-Breed method gives the most reliable results.

4. The total numbers of bacteria found by the microscopic examination are so out of proportion to those given by those of the plate method that no ratio can be at present drawn between them.

5. The data which have as yet been collected are insufficient to determine whether the microscopic examination of pasteurized milk is of any value.

6. The determination of dirt by filtering a quart of milk through a cotton disk of an inch in diameter is advised as of the greatest value in detecting uncleanly conditions and in conveying a most graphic lesson of the need of cleanliness to the dairyman. Preferably this should be done in the dairy where feasible.

METHODS OF REPORTING BACTERIAL COUNTS.

CLASSIFICATION OF DEALERS' MILKS.

The commission recommends the use of North's modification of Levy's method of giving each bacterial count a rating value. This modification consists in the use of such values as can be obtained from a parabolic curve having as ordinates the ratings and as abscissas the bacteria counts. The final statement of a series of bacterial counts is given as a single figure which expresses the sanitary character of the milk in terms of bacteria per cubic centimeter. This figure, it is recommended, shall be known as the "bacterial content."

To warrant a statement of the class or grade in which a given milk belongs, at least four consecutive counts should be made of separate samples of milk taken within a period of not more than four weeks.

All laboratory workers are familiar with the fact that the differences in sanitary importance of high and low bacterial counts are not proportional to the numerical differences. It is recognized that bacteria multiply in geometric progression. A single germ may divide, under favorable conditions, about once every half hour, so that from 1 it will have increased to 281,474,976,710,656 within 24 hours. This means that under favorable conditions, if there were no interruptions and no deaths, 1 germ in a 40-quart can of milk might multiply in 24 hours, so that 1 cubic centimeter of milk would contain over 7,438,000,000. The ability of some bacteria to multiply with extreme rapidity is the reason why high counts should not be given the same value which is given to low counts.

The method proposed for stating the results of bacterial counts aims to recognize all high counts but at the same time to prevent them from misrepresenting the real character of the milk. The method may at first seem complicated because of its use of higher mathematics, but as a matter of fact is extremely simple.

THE PARABOLIC CURVE.

Without going into a discussion of the properties of the different mathematical curves, it can be stated that a parabola is a regular curve, which increases its distance far more rapidly in a horizontal direction than in a vertical direction, or vice versa, and, consequently, lends itself to the conditions of the problem which faces

the bacteriologist who has, on the one hand, bacteria counts which increase enormously in the higher figures, while on the other he has values which he desires to attach to the same, which do not differ so enormously. The values for bacteria counts obtained from the parabola are as follows:

Where

$$y^2 = 1/100.$$

x = bacteria count.

y = rating corresponding.

Bacteria counts.	Normal rating.	Bacteria counts.	Normal rating.	Bacteria counts.	Normal rating.
100	1.00	9,000	9.5	300,000	54.8
200	1.41	10,000	10.0	400,000	63.2
300	1.73	15,000	12.3	500,000	70.8
400	2.00	20,000	14.1	600,000	77.5
500	2.24	25,000	15.8	700,000	83.7
600	2.45	30,000	17.3	800,000	89.5
700	2.65	35,000	18.7	900,000	95.0
800	2.83	40,000	20.0	1,000,000	100.0
900	3.00	45,000	21.2	2,000,000	141.0
1,000	3.16	50,000	22.4	3,000,000	173.0
2,000	4.47	60,000	24.5	4,000,000	200.0
3,000	5.48	70,000	26.4	5,000,000	224.0
4,000	6.32	80,000	28.3	6,000,000	245.0
5,000	7.08	90,000	30.0	7,000,000	265.0
6,000	7.75	100,000	31.6	8,000,000	283.0
7,000	8.37	200,000	44.7	9,000,000	300.0
8,000	8.95	250,000	50.0	10,000,000	316.0

From the diagram of the parabolic curve shown on page 699 the values in the table given were taken. For any bacterial count a corresponding value can be found by observing the point on the curve intersected by the line leading upward from the bacterial count and following the line of rating value which leads to the right or left at this point. Thus the line leading upward from 10,000 bacteria strikes the curve at a point through which passes the line leading to the left having rating value 10, and bacterial line 40,000 meets curve at point intersected by line of rating value 20; bacterial line 1,000,000 meets rating line 100.

In the figure the curve from 40,000 to 100,000 bacteria is much condensed to save space, and from 100,000 to 1,000,000, and again to 4,000,000, is still further condensed; these shortenings account for disjointed appearance.

This table is used as follows: Assume that a health board laboratory makes four consecutive examinations of the milk of a single dealer, and that these are as follows: 25,000, 70,000, 250,000, and 5,000,000. It desires to determine in what class this milk belongs. To express the character of the milk in a single figure set opposite each bacteria count the normal rating value found in the above table. This would be as follows:

Bacteria count.	Normal ratings.
25,000	15.8
70,000	26.4
250,000	50.0
5,000,000	224.0
	4) 316.2
	79.0 = 600,000 +

After the normal ratings are obtained for each figure, they are added together and averaged, as shown above, giving the average rating 79. Again referring to the table it will be observed that the nearest figure in the normal rating column is 77.5, opposite which is the bacteria count of 600,000. Consequently, the final character of the milk will be expressed by the figure 600,000 bacteria per cubic centimeter. Pursuing this system with all milks makes it possible to express their character in a single figure in terms of bacteria, which it is suggested should be called "the bacterial content."

THE RATING OF A CITY'S ENTIRE MILK SUPPLY.

In the annual report of a city's department of health it is often desirable to compare the results of one year's work with another, or to compare one city's standing with that of another. For these purposes the commission recommends the use of the Levy method of stating the results of bacterial counts. In this method the bacterial counts are first divided into groups, as recommended by the American Public Health Association. To each of these groups certain percentage values are given. The final expression is made as a single figure in terms of percentage.

The groups and the percentage values recommended for each are as follows:

Bacteria.	Rating figure.	Bacteria.	Rating figure.
	<i>Per cent.</i>		<i>Per cent.</i>
Under 10,000.....	100	250,001 to 500,000.....	20
10,001 to 50,000.....	90	500,001 to 1,000,000.....	10
50,001 to 150,000.....	75	Over 1,000,000.....	0
100,001 to 250,000.....	50		

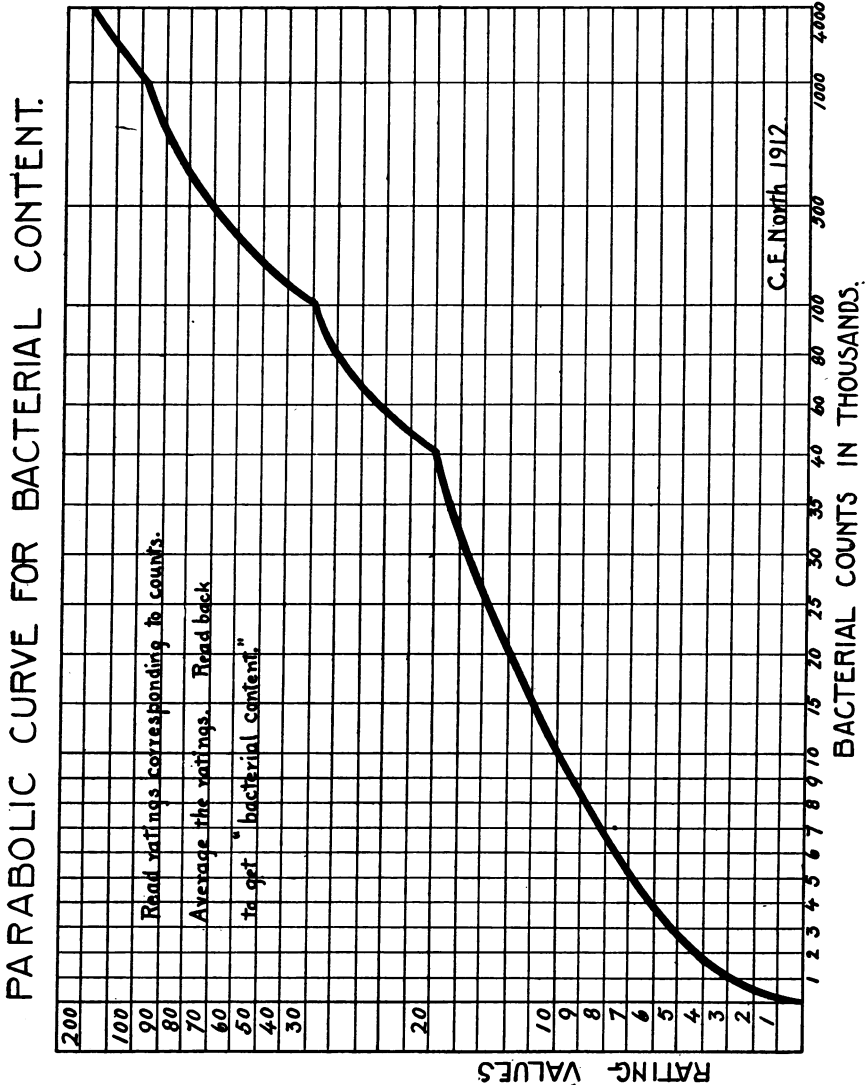
In using the above table all of the bacterial counts are first divided into groups, stating the number in each group. Each number is then multiplied by the percentage value of its group, as illustrated in the following table:

Bacteria.	Number of samples.	Rating figure.	Product.
		<i>Per cent.</i>	
Under 10,000.....	25	100	2,500
10,001 to 50,000.....	73	90	6,570
50,001 to 100,000.....	37	75	2,775
100,001 to 250,000.....	42	50	2,100
250,001 to 500,000.....	53	20	1,060
500,001 to 1,000,000.....	23	10	230
Over 1,000,000.....	12	0	0
Total.....	265		15,235

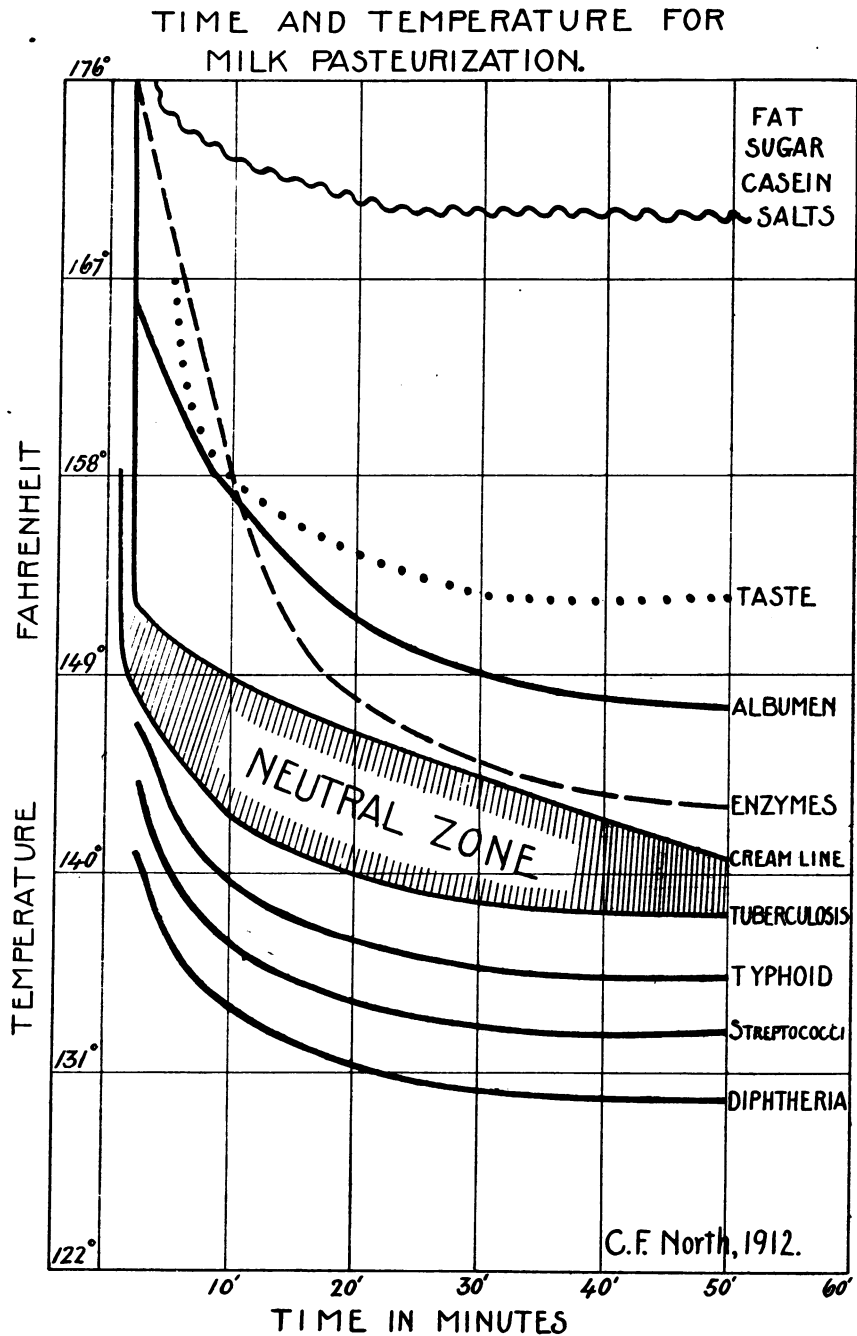
$$\frac{15,235}{265} = \text{Average} = 57 \text{ per cent.}$$

The final statement, which is the average of all percentages, is called by Levy the "bacterial index."

In reporting results of laboratory work under city conditions it is desirable that a more detailed statement be given than the single



figures of "bacterial content" and "bacterial index," and it is therefore recommended that all tests made or at least all in each group be reported when possible as approved by the laboratory section of the American Public Health Association.



NATIONAL QUARANTINE AT PROVIDENCE, R. I.

The city of Providence, R. I., has requested the Secretary of the Treasury to establish a national quarantine station at the port of Providence, R. I.

Copies of the joint resolution of the city council and of an act of the Rhode Island General Assembly, together with the letter of transmittal, follow:

CITY OF PROVIDENCE.
EXECUTIVE DEPARTMENT.
City Hall, April 30, 1912.

HON. FRANKLIN MACVEAGH,
Secretary of the Treasury, Washington, D. C.

SIR: By virtue of authority in me vested, I have the honor to transmit to you, herewith, a copy of a resolution adopted by the city council of Providence, R. I. (together with a copy of a permissive act passed by the Rhode Island General Assembly and approved by his excellency the governor on April 18, 1912), requesting the Secretary of the Treasury of the United States to establish a complete system of national quarantine for the port of Providence, and providing, in the event of such establishment, for a suspension of the duties of the quarantine health officer and sentinel of this port for so long a period as such Federal quarantine inspection shall be maintained.

Most respectfully, yours,

HENRY FLETCHER. *Mayor.*

THE CITY OF PROVIDENCE.

Joint resolution of the city council No. 97, approved March 5, 1912.

Resolved, That the city solicitor is hereby directed to apply to the general assembly for such legislation as will provide that, upon the establishment by the United States of a system of quarantine inspection for the port of Providence, the duties of the quarantine health officer and sentinel thereof shall be suspended for so long a period as such quarantine inspection shall be maintained, and that, upon the establishment of a complete system of national quarantine for said port, the city of Providence shall be relieved of further maintaining its system of quarantine for said port, substantially in conformity with the accompanying draft act; and that upon the passage of such legislation the city of Providence hereby requests the Secretary of the Treasury of the United States to establish a complete system of national quarantine for the port of Providence, and authorizes the mayor to transmit to said Secretary a copy of this resolution, certified by the city clerk.

STATE OF RHODE ISLAND.

In General Assembly, January Session, A. D. 1912.

AN ACT In amendment of and in addition to chapter 114 of the general laws, entitled "Of quarantine."

It is enacted by the general assembly as follows:

SECTION 1. Chapter 114 of the general laws, entitled "Of quarantine," is hereby amended by adding thereto the following section:

"SEC. 17. Whenever the United States of America shall put in force a system of national quarantine inspection for the port of Providence the duties of the quarantine health officer and sentinel of said city shall be suspended for so long a period as such quarantine inspection shall be maintained, and whenever said United States shall establish a quarantine station, ground, or anchorage on or in the Providence River or Narragansett Bay north of Conimicut Point, and put in force a complete system of national quarantine for the port of Providence, the provisions of sections 1 to 12, both inclusive, of this chapter shall not apply to the city of Providence or the port thereof."

SEC. 2. This act shall take effect upon its passage.

STATE OF RHODE ISLAND,
OFFICE OF THE SECRETARY OF STATE,
Providence, April 26, 1912.

I hereby certify the foregoing to be a true copy of the original act approved by his excellency the governor on the 18th day of April, A. D. 1912.

In testimony whereof, I have hereunto set my hand and affixed the seal of the State aforesaid the date first above written.

[SEAL.]

J. FRED PARKER,
Secretary of State.

In compliance with the above request, and under the authority of section 8 of an act entitled "An act granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service," approved February 15, 1893, the Secretary of the Treasury will detail an officer of the Public Health and Marine-Hospital Service to assume charge of the quarantine.

UNITED STATES.

MUNICIPAL ORDINANCES, RULES, AND REGULATIONS PERTAINING TO PUBLIC HYGIENE.

[Adopted since July 1, 1911.]

BEAUMONT, TEX.

MILK—PRODUCTION, CARE, AND SALE.

SECTION 1. That from and after this ordinance becomes operative, it shall be unlawful for any person, firm, or corporation, either as principal or through agents, servants, or employees, to maintain or operate a dairy or dairy farm, or to give, sell, exchange, barter, or have in his possession for gift, sale, exchange, delivery, use, or consumption as food for human beings in the city of Beaumont any milk or cream without having first obtained from the health department of the city of Beaumont a permit so to do as hereinafter provided.

SEC. 2. To obtain such permit the applicant shall present to the said health department a written application, upon a form to be prescribed by the said health department, and shall state therein the name, business, and resident address of said applicant, the dairy or dairy farm where he produces or from which he procures supplies of milk and cream, the number of cows, if any, in the possession of such applicant, the daily average quantity of milk produced or procured, and the average quantity of milk disposed of by said applicant, and the manner and character of such disposition, and, if an itinerant distributor, the usual route pursued in such disposition, or if located at a stand or in any place or store, the usual hours when milk or other dairy products are received, and, in general, the manner in which said applicant complies with the regulations adopted in this ordinance governing dairies, dairy farms, and the traffic and the distribution of milk and cream. Said applicant shall further state the specific brand or business name, if any, under which said milk or cream is to be sold, exchanged, bartered, given, or distributed. Said written application shall be recorded in a register to be provided by the said health department and kept for that purpose.

SEC. 3. That if, upon investigation, the said health department shall conclude that the said applicant has conformed, and will conform to, and comply with, the requirements of this ordinance, it shall issue the permit herein provided, without cost to said applicant. Such permit shall be written upon a form to be prescribed by the said health department.

SEC. 4. A permit shall be required for each dairy or dairy farm, and for each place where milk or cream is sold, exchanged, bartered, given, stored, or distributed as food for human beings, either alone or together with other food or merchandise. Such permits shall be issued only in the name of the owner or distributor of such milk or other dairy product and shall be personal and nontransferable. Said permit shall be subject at all times to revocation by the said health department for cause, provided the applicant shall have five days' notice to show wherein his license should not be revoked.

SEC. 5. It shall be the duty of the person, firm, or corporation having a permit under this ordinance to exhibit the same conspicuously in the dairy or in the place where the milk or cream is kept for sale, exchange, barter, use, or distribution. All vehicles used for such sale or distribution shall display on both sides thereof either painted or metallic figures, not less than 3 inches in height, which number shall correspond with the permit number. All distributors of milk and cream on foot shall carry on their person, ready for exhibition to any sanitary officer or customer, the permit issued to him under this ordinance.

SEC. 6. Milk and cream kept for sale, use, consumption, distribution, exchange, barter, or other disposition as food for human beings, in any store, shop, restaurant,

market, bakery, hotel, or other establishment shall always be kept in a covered cooler box, or refrigerator, which shall be substantially constructed, lined with metal or tiles and elevated at least 6 inches above the floor. Said cooler, box, or refrigerator shall be ventilated and properly drained.

SEC. 7. No cow shall be used in any dairy or dairy farm which is known to be suffering with splenic fever, anthrax, or any local or general disease which is liable to render the milk from said cow unwholesome, and as soon as any contagious or infectious disease is detected in any cow or cows in any dairy herd said cow or cows shall be isolated and the surface of the inclosure where said cattle are isolated shall be disinfected each day and all droppings burned. In the case of charbon or anthrax the same precaution shall be exercised as in other contagious or infectious diseases and the entire herd shall be vaccinated immediately. Where infectious or contagious disease is detected in any dairy herd no milk shall be sold from that dairy for a period of 10 days after the beginning of the last case infected.

SEC. 8. It shall be unlawful for any person or firm or corporation to carry on any wagon or vehicle upon or from which milk or cream is being or is brought, carried, stored, deposited, sold, exchanged, delivered, or distributed, or offered for sale or exposed for sale or distribution as food for any human being, any swill, garbage, refuse, or any decaying or fermenting, putrefying, foul, unwholesome, noxious or filthy matter, or any cans or receptacles containing any material or substance with which cream or milk might be diluted, adulterated, or rendered impure, unwholesome, or unhealthy.

SEC. 9. No person, firm, or corporation shall within the city of Beaumont manufacture for sale, have in his possession with intent to sell, offer, or expose for sale, or sell or exchange any milk or cream which is adulterated within the meaning of this act.

SEC. 10. It shall be unlawful for any person, either by himself or agent, to sell or expose for sale or exchange any unwholesome, watered, adulterated, or impure milk, or swill milk or colostrum, or milk from cows kept upon garbage, swill, or any other substances in the state of putrefaction or other deleterious substance, or from cows kept in connection with any family in which there are infectious diseases, or from sick or diseased cows; provided, "skim milk" may be sold if on the can or package from which such milk is sold, the words "skim milk" are distinctly printed in letters not less than 1 inch in length.

SEC. 11. That for the purpose of this act milk or cream shall be deemed to be adulterated:

(1) If any substance has mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength.

(2) If any substance has been substituted wholly or in part.

(3) If any valuable constituent has been wholly or in part abstracted, or if the product be below that standard of quality, quantity, strength, or purity represented to the purchaser or consumer.

(4) If it be mixed, colored, or stained in any manner whereby damage or inferiority is concealed.

(5) If it contain any added poisonous or other added deleterious ingredient which may render such article injurious to health.

(6) If it contain any filthy, decomposed, or putrid animal or vegetable substance. For the purpose of this act the term "filthy" shall be deemed to apply to milk and cream not securely protected against flies, dust, dirt, and, as far as may be necessary by all reasonable means, from all foreign or injurious contaminations.

SEC. 12. The standard for whole milk sold or exposed for sale or exchange and intended for use and human consumption in the city of Beaumont shall be that adopted by the United States Department of Agriculture and the dairy, food, and drug department of the State of Texas; it shall be whole milk, neither watered nor skimmed in any degree, and must contain of fat not less than 3.25 per cent, of nonfatty solids not less than 8.5 per cent, and of total solids not less than 11.75 per cent.

SEC. 13. The standard for cream shall be the fat contained in 4 gallons of standard whole milk, and standard cream shall contain of fat not less than 13 per cent.

SEC. 14. It shall be the duty of the health officer to cause all dairies, dairy farms, and other establishments from which milk or cream is sold, offered for sale, exchange, or distribution for human consumption in the city of Beaumont, to be inspected from time to time to satisfy such health officer that the provisions and requirements of this ordinance are constantly complied with.

SEC. 15. The said health officer, his officers, agents, and employees shall have the right and it shall be his duty to enter and have full access, egress, and ingress to all places where milk or cream is stored, sold, or kept for sale, and to all wagons, carriages, or other vehicles, railroad cars, steamboats, or other conveyances of every kind used for the conveyance or delivery or distribution of milk or cream for the purpose of human consumption in the city of Beaumont.

Sec. 16. The health officer and his agents and employees shall have the right any time and it shall be his duty to take a sample of milk or cream from any person, persons, or concern selling or exposing for sale, or exchange, or delivering or distributing milk or cream in the city of Beaumont; not exceeding, however, 1 pint thereof, such samples to be taken and sealed in full view and in the presence of the person from whom said sample is taken, and shall then and there furnish to the person from whom such milk or cream is taken one-half of such sample, hermetically sealed, and shall retain the sample so taken hermetically sealed; such sample shall have written thereon the number of the dealer's permit, the date on which the sample was obtained, the name of the person by whom it was taken, and a memorandum thereof shall be made by the person obtaining such sample in a book kept for that purpose in the office of the health department, showing the name of the owner or driver from whom the sample was taken, the date the same was taken, and the number of the dealer's permit.

Sec. 17. Any person who shall violate any of the provisions of this ordinance shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be punished by a fine of not less than \$25 and not more than \$200.

[Ordinance adopted Oct. 3, 1911.]

GRAND RAPIDS, MICH.

MILK—PRODUCTION, CARE, AND SALE.

SECTION 1. No person, persons, firm, or corporation shall bring to the city of Grand Rapids, keep for sale, sell, barter, handle, or traffic in milk, cream, or buttermilk within the city of Grand Rapids without first having been duly licensed so to do.

Sec. 2. Any person, persons, firm, or corporation, except common carriers, desiring to transport, keep for sale, sell, handle, barter, or traffic in milk, cream, or buttermilk within the city of Grand Rapids shall make application in writing for permission therefor to the board of health of said city of Grand Rapids upon blanks to be provided by said board. Said board shall require any such applicant to state in writing upon said blanks:

First. The applicant's full name, residence, and post-office address, and whether such applicant is an individual, firm, or corporation.

Second. The location of applicant's place or places of business, together with the place or places where any milk or cream is kept, handled or sold by said applicant, together with the location of the dairy farms from which the milk so handled or to be handled is obtained or produced.

Third. The names and addresses of all intermediate agencies or persons who handle the milk or cream between the place or places where the milk or cream is produced and the place or places where such milk or cream is received by the applicant, together with a statement of the method of transporting such milk or cream.

Fourth. The manner in which said applicant intends to dispose of milk or cream after receiving a license therefor as herein provided.

Fifth. An agreement that said applicant will notify the board of health of any intended change of supply, as required in paragraph No. 2, before making such change.

Sec. 3. Upon the signing of such application by the applicant, or some one duly authorized by him in writing, said board of health shall make or cause to be made an investigation to ascertain whether such applicant and those who furnish milk and cream for such applicant are in a position to observe, and are willing to observe, the terms and conditions of this ordinance, and said applicant shall agree to permit any duly authorized officer, inspector, or agent of said board of health to go upon the premises of any person, persons, firm, or corporation from which such applicant may receive milk or cream, or may intend to receive milk or cream for consumption in said city of Grand Rapids, and permit said representatives of said board of health to inspect the methods employed by said applicant for handling milk and cream and caring for the same when received, and shall permit the officers of said board or its agents or inspector to examine the utensils used in handling said milk and cream, and give full and complete inspection thereof from the time the same comes into the control of the applicant until the same is sold and delivered by him. And if it shall appear to the board after such investigation that said applicant is in a position to furnish clean, pure, wholesome, healthy, and unadulterated milk, cream, and buttermilk to his customers, if he is licensed so to do by the said board, then the board of health shall indorse upon the application a favorable report and transmit the application to the city clerk of the city of Grand Rapids, and no such application shall be sent to the city clerk unless the same shall be favorably indorsed by the board of health.

SEC. 4. On receipt of such application favorably indorsed the city clerk of said city shall, if said applicant produces all of the milk and cream to be handled by himself, issue a license to such person without charge; but if said applicant handles or expects to handle or deal in milk produced by other persons than himself, the clerk shall issue a license to such applicant on payment to said clerk of the following fees: For the selling of milk, cream, or buttermilk from wagons, for each wagon, \$5; from a dairy, creamery, or milk depot, \$5; from a cart pushed or propelled by hand or from a store, \$2; from a can carried by hand and for selling at houses, restaurants, and other places, \$1. Said license shall not be transferable. The license fee may be required for one full year or any fractional part thereof ending on the first Monday of May.

SEC. 5. It shall be the duty of the city clerk to enter in a book or card index system to be provided for that purpose the name of each person to whom a license shall be issued, stating the name and place of residence of such person, the date of the issuance of such license, and the amount received therefor. But each license shall be numbered consecutively, and upon the issuance of any license the number of the same shall be stamped upon the application therefor, and thereupon such application shall be returned to the board of health and be kept by the board as a part of the records of its department.

SEC. 6. It shall be unlawful for any person, persons, or corporation to keep or offer for sale or consumption, or bring into said city to be sold for consumption any impure, unhealthy, or adulterated milk, cream, or buttermilk.

SEC. 7. Milk or cream under the terms of this ordinance shall be held to be impure or unwholesome or adulterated whenever any of the following conditions exist:

1. When the milk or cream is produced in filthy, foul smelling, and poorly ventilated stables, or when placed, kept, or stored in unclean utensils, cans, or bottles.

2. When the milk or cream at any place between the point of production and the place where it leaves the control or possession of the person holding the license shall be placed, kept, or stored in any utensil, bottle, or vessel of any description that has not been thoroughly washed and scalded with boiling water or live steam within one hour of its use as a milk or cream receptacle, and after its use for any other purpose it shall be washed and scalded as aforesaid before it shall be used as a milk or cream receptacle.

3. When the milk is drawn from the cow without first brushing or removing all material or substances from the cow that would be liable to fall into the milk during the milking process, and without first thoroughly cleansing the udder and teats of the cow and the hands and person of the milker; also when the milking is done with the hands wet with milk and the first two streams or any part thereof, from each teat are milked into the pail or other receptacle used in milking.

4. When the milk is not immediately removed from the stable after milking and cooled to a temperature of 60° or less and thereafter continuously kept at a temperature of not to exceed 60° F. until delivered to the ultimate consumer.

5. Where the owner or owners of the milk or cows refuse to allow the proper officials of the board of health to make inspection and investigation as provided by this ordinance.

6. When milk is drawn from any cow less than 20 days before or within 5 days after calving.

7. When the milk is drawn from any cow suffering from any disease, or disease or injury of the udder or teats, or the milker is afflicted with any communicable disease, or within 24 hours prior to the milking has been in contact with or caring for anyone afflicted with a communicable disease.

8. When the milk is drawn from cows fed wholly or in part upon the waste of distilleries or breweries, or brewers' grains in a fermented condition, or upon any other food or drink that produces tainted, impure, or unwholesome milk.

9. When any milk or cream contains any substance not a natural or normal constituent of milk.

10. When any milk contains more than 87½ per cent of water fluid or less than 12½ per cent of total milk solids, or less butter fat than 3 per cent Babcock test, and when the specific gravity of the milk at 60° F. shall not be between 1.029 and 1.033.

11. When milk shall contain more than 200,000 bacteria per cubic centimeter.

12. When milk or cream contains any substance or substances that have been added thereto for the purpose of preserving the same or preventing the same from souring.

13. When milk is drawn from any cow that shall not within one year last past have been inspected and tested to ascertain whether such animal is affected with tuberculosis or other contagious or infectious disease.

The inspection and test named in this paragraph shall be held complied with if the owner or owners of such cow shall within one year from the going into effect of this

ordinance file in the office of the board of health a certificate of a duly licensed veterinary surgeon, or any other person given authority by the State livestock sanitary commission to make tuberculin tests, on blanks to be furnished by the board of health, stating that such cow has been tested with tuberculin and examined and found free from tuberculosis or other contagious disease. Such certificate shall give a number which has been permanently attached to such cow and a description sufficiently accurate for identification, stating the date and place of such examination, which certificate shall be good for one year from its date and be renewed annually and filed with the board of health. It shall be the duty of the board of health to furnish the blanks herein mentioned and make appropriate rules and regulations for carrying into effect the provisions of this subsection.

14. When cream contains less butter fat than 18 per cent, Babcock test.

15. When milk or cream is kept in any place not screened from flies or protected from fowls or animals.

16. When any milk is bloody or stringy.

17. When conditions are found to exist that makes such milk or cream dangerous or unhealthy or not fit for human use.

18. When the room in which the milk is cooled or stored is immediately connected with a stable in which animals are kept or confined.

Sec. 8. The milk and cream furnished by every hotel keeper, restaurant keeper, or boarding-house keeper to his or their guests shall be in all respects up to the standard herein specified, otherwise such hotel keeper, restaurant keeper, or boarding-house keeper shall be liable to the pains and penalties of this ordinance.

Sec. 9. No person, persons, firm, or corporation shall sell or offer for sale, expose for sale, or keep with the intention of selling, any milk or cream at retail unless the same shall be kept in a tightly covered receptacle or sold in bottles.

Sec. 10. Any producer or dealer in milk or cream who sends his, her, its, or their product to the city of Grand Rapids for consumption in any form and receives compensation therefor according to the per cent of butter fat as shown by a test or tests made by such producer or dealer, is hereby required to make such test or tests accurately and correctly, and to accurately report such to the purchaser, and in case it is found that such producer or dealer is making tests that are inaccurate or incorrect, or false, or is incorrectly or falsely reporting such tests to the purchaser, then and in such case such producer or dealer shall be liable to the pains and penalties of this ordinance.

Sec. 11. All buttermilk kept or offered for sale in the city shall be manufactured from pure cream or milk and shall be kept, handled, and sold in accordance with the provisions hereof made for keeping and handling milk and cream.

Sec. 12. Nothing in this ordinance contained shall prevent the sale of skimmed milk or sour milk, provided, however, that the same shall be sold as such, and skimmed milk shall only be kept for sale in utensils plainly marked "Skimmed milk." Skimmed milk and sour milk shall conform to the standards of purity and temperature required of sweet milk.

Sec. 13. Milk tickets must not be used more than once. All milk, cream, or buttermilk sold or offered for sale in bottles must be bottled at the dairy house, creamery, or milk depot, and milk must not be put in bottles while on the road. The hauling of milk cans, bottles, or other vessels in which milk shall be delivered to or from the place of delivery in wagons used for hauling manure or swill or any other unclean vehicle is expressly prohibited. Bottles used as milk, cream, and buttermilk containers must not be used for other purposes.

Sec. 14. The board of health of the city of Grand Rapids, together with the health officer and milk inspector and duly authorized inspectors of said board of health, are authorized and it is made their duty to conduct such inspections and make such investigations as to enable them to know that the conditions of this ordinance are being observed. And after the first Monday of May, 1912, it shall be unlawful for any person, persons, firm, or corporation to bring into, keep for sale, offer for sale, or sell within the city of Grand Rapids, any milk or cream unless the requirements set forth in this ordinance have been complied with, and after the said date it is made the duty of the board of health to enforce the provisions of this ordinance, and any member of such board or its agent or agents are authorized to enter upon the premises of any milk dealer or any person, firm, or corporation having in his, its or their possession any milk or cream destined for consumption in said city, for the purpose of making the necessary inspection and investigation to ascertain whether the conditions of this ordinance are observed, and said officials are hereby authorized to take samples of milk or cream at any time or place, not exceeding 1 quart in amount, for the purpose of testing the same. If it is found at any time by said board or any of its officers or agents that milk or cream after the first Monday of May, 1912, is being sold, kept for sale, or offered for sale for consumption within said city, that does not comply with

the terms of this ordinance, said board is hereby authorized and it is made its duty to seize said milk or cream and destroy the same, after having given such notice to the owner or person having charge thereof as to the said board seems reasonable, and given such person a hearing thereon, or to make disposition of the same in such a manner as will not be a menace to the health of the residents of the said city. It shall be the duty of the board of health to publish monthly the names, score, condition of equipment, methods, sanitary conditions, or such other data it may think proper to inform the consuming public of the standing and efficiency of every dealer in milk in the city of Grand Rapids.

SEC. 15. Said board of health is hereby empowered in its discretion to revoke the license or permit of any person, persons, firm or corporation who by himself, themselves, or itself, or their servants, agents, or employees ignore and violate the terms and requirements of this ordinance, on conviction thereof, in addition to the other penalties provided in this ordinance, shall be liable to a fine of not less than \$2 nor more than \$100, and the costs of prosecution, and be liable to imprisonment in the county jail of the county of Kent, in the discretion of the court or magistrate before whom the conviction may be had, for a period of not less than 5 days nor more than 90 days, and in case such court or magistrate shall only impose a fine and costs, the offender may be sentenced to any jail of the county of Kent until the payment of such fine and costs for a period of not more than 90 days, and such punishment shall apply to each succeeding day of continuous offense.

[Ordinance adopted Jan. 29, 1912.]

CEREBROSPINAL MENINGITIS.

CASES AND DEATHS REPORTED BY CITY HEALTH AUTHORITIES FOR THE WEEK ENDED APR. 20, 1912.

City.	Cases.	Deaths.	City.	Cases.	Deaths.
Boston, Mass.	2	1	Newark, N. J.	1	1
Chattanooga, Tenn.	2	2	New Orleans, La.		1
Chicago, Ill.	2	1	New York, N. Y.	10	11
Cincinnati, Ohio.	5		Oklahoma City, Okla.	1	1
Cleveland, Ohio.	1	1	Philadelphia, Pa.	1	
Dayton, Ohio.		1	Rockford, Ill.		1
East St. Louis, Ill.	1		Saginaw, Mich.	12	
El Paso, Tex.	4	3	St. Louis, Mo.	5	5
Fort Wayne, Ind.	1		San Antonio, Tex.	6	4
Galveston, Tex.	1	1	San Francisco, Cal.		1
Haverhill, Mass.	3	4	Saratoga Springs, N. Y.	1	
Kansas City, Kans.	10		Spokane, Wash.		3
Kansas City, Mo.	20	20	Springfield, Ill.		1
Los Angeles, Cal.	1	1	Springfield, Mass.	1	1
Nashville, Tenn.	12	5	Wilmington, Del.		1

Chicago, Ill.

The commissioner of health reports May 1 the occurrence of three cases of cerebrospinal meningitis at Chicago, Ill., in young Greek adults who arrived at New York, N. Y., April 19, on the steamship *Macedonia*.

Gary, Ind.

Two cases of cerebrospinal meningitis in persons from the steamship *Macedonia* were reported at Gary, Ind., May 2.

The *Macedonia* left Piraeus, the port of Athens, Greece, April 2, for New York via Greek ports and St. Michaels. Cerebrospinal meningitis has been reported prevalent in many parts of Greece since December 1, 1911.

New York, N. Y.

Surg. Stoner reports May 6: Two cases of cerebrospinal meningitis in Greeks arriving April 19 on the steamship *Macedonia* were removed at quarantine. One of these cases ended fatally April 22. In addition to these, during the month of April, five aliens suffering from cerebrospinal meningitis were admitted to the immigration contagious-disease hospital. One case ended fatally. These cases arrived as follows: Three on steamship *Athani*, 1 on steamship *Verdi*, and 1 on steamship *Kaiserin Auguste Victoria*.

During the month of March, 1912, 11 aliens suffering from cerebrospinal meningitis were admitted to the immigration contagious-disease hospital. Of these 4 died. The cases were removed from several different vessels.

ERYSIPELAS.

CASES AND DEATHS REPORTED BY CITY HEALTH AUTHORITIES
FOR THE WEEK ENDED APR. 20, 1912.

City.	Cases.	Deaths.	City.	Cases.	Deaths.
Binghampton, N. Y.	1		Milwaukee, Wis.	8	1
Boston, Mass.		1	Montclair, N. J.	1	
Cincinnati, Ohio.	4		Newark, N. J.		1
Cleveland, Ohio.	6	1	New York, N. Y.	44	12
Duluth, Minn.	3		Passaic, N. J.	1	
Harrisburg, Pa.	2		Philadelphia, Pa.	3	2
Hartford, Pa.	1		Pittsburgh, Pa.	3	
Jersey City, N. J.		3	St. Louis, Mo.	14	
Kalamazoo, Mich.	1		San Francisco, Cal.	3	1
Kansas City, Mo.	1		Taunton, Mass.		1
Los Angeles, Cal.	4	1	Wilkes-Barre, Pa.	1	
Lowell, Mass.		1	Williamsport, Pa.	1	
Lynn, Mass.		1	York, Pa.	1	

PELLAGRA.

During the week ended April 20, 1912, pellagra was reported by city health authorities as follows: Baltimore, Md., 1 death; Columbus, Ga., 1 death; Lexington, Ky., 1 death.

PNEUMONIA.

CASES AND DEATHS REPORTED BY CITY HEALTH AUTHORITIES
FOR THE WEEK ENDED APR. 20, 1912.

City.	Cases.	Deaths.	City.	Cases.	Deaths.
Alameda, Cal.	2	2	Nashville, Tenn.		4
Altoona, Pa.		4	Newark, N. J.		11
Auburn, N. Y.	2	2	New Bedford, Mass.		6
Aurora, Ill.		3	Newburyport, Mass.		1
Baltimore, Md.		21	New Castle, Pa.	2	
Binghamton, N. Y.	6	5	New Orleans, La.		10
Boston, Mass.		38	Newton, Mass.		2
Bridgeport, Conn.		4	New York, N. Y.		141
Brockton, Mass.		2	Niagara Falls, N. Y.		4
Brookline, Mass.		1	Oklahoma, Okla.		4
Cambridge, Mass.		6	Omaha, Nebr.		3
Camden, N. J.	19		Passaic, N. J.		5
Chicago, Ill.	32	110	Pawtucket, R. I.		8
Chelsea, Mass.		2	Philadelphia, Pa.	18	44
Chicopee, Mass.		5	Pittsburgh, Pa.	35	31
Cincinnati, Ohio.		10	Pittsfield, Mass.		1
Cleveland, Ohio.	22	15	Plainfield, N. J.		1
Cumberland, Md.		1	Providence, R. I.		6
Danville, Ill.		1	Racine, Wis.		2
Dayton, Ohio.		5	Reading, Pa.	3	2
Denver, Colo.		4	Richmond, Va.		3
Duluth, Minn.		1	Roanoke, Va.		1
Dunkirk, N. Y.	2		Rutland, Vt.	2	
East Orange, N. J.		2	Saginaw, Mich.		5
Elmira, N. Y.		1	Salem, Mass.		1
El Paso, Tex.		2	San Diego, Cal.	1	1
Evansville, Ind.		2	San Francisco, Cal.	8	
Fall River, Mass.		1	Schenectady, N. Y.	8	4
Fort Wayne, Ind.	1		Saratoga Springs, N. Y.	3	1
Galesburg, Ill.	2	2	Seattle, Wash.		1
Grand Rapids, Mich.	2	2	South Bend, Ind.		2
Harrisburg, Pa.		7	South Bethlehem, Pa.	1	
Hartford, Conn.		2	South Omaha, Nebr.	7	7
Kalamazoo, Mich.	4	1	Spokane, Wash.		2
Kansas City, Mo.	10	7	Springfield, Ill.		1
Knoxville, Tenn.		1	Springfield, Mass.		2
Lawrence, Mass.		3	Superior, Wis.		1
Lexington, Ky.		2	Taunton, Mass.		1
Los Angeles, Cal.	1	9	Toledo, Ohio.		4
Lowell, Mass.		1	Waltham, Mass.		1
Lynchburg, Va.		1	Washington, D. C.		17
Lynn, Mass.		1	Wilkes-Barre, Pa.		3
Malden, Mass.		1	Williamsburg, Pa.	1	
Marinette, Wis.		1	Williamsport, Pa.	1	1
Medford, Mass.		1	Wilmington, Del.		9
Montclair, N. J.	1		Zanesville, Ohio.		3

POLIOMYELITIS.

During the week ended April 20, 1912, poliomyelitis was reported by city health authorities as follows: Boston, Mass, 1 death; Newark, N. J., 1 case; New York, N. Y., 4 cases; Philadelphia, Pa., 1 case.

RABIES.

During the week ended April 20, 1912, 6 deaths from rabies were reported by the city health authorities of Kearny, N. J., and 13 cases were reported at San Francisco, Cal.

During the period from April 15 to 22, 1912, 4 cases were reported at Jacksonville, Fla.

SMALLPOX IN THE UNITED STATES.

In the following table the States indicated by an asterisk are those from which reports of smallpox are received only from certain city, and in some cases county, boards of health. In these States, therefore, the recorded cases and deaths should not be taken as showing the general prevalence of the disease. In the States not marked by an asterisk the reports are received monthly from the State boards of health and include all cases reported to the State authorities.

REPORTS RECEIVED DURING WEEK ENDED MAY 10, 1912.

Places.	Date.	Cases.	Deaths.	Remarks.
Florida:				
Counties—				
Duval.....	Apr. 16-22.....	7	1	
Escambia.....	do.....	6		
Hillsboro.....	do.....	1		
Leon.....	do.....	3		
Putnam.....	do.....	17		
Total for State.....		34	1	
*Louisiana:				
New Orleans.....	Apr. 21-27.....	13		
*Missouri:				
St. Louis.....	do.....	4		
*Nebraska:				
Omaha.....	do.....	1		
New Jersey:				
Counties—				
Essex.....	Mar. 1-31.....	1		
New York:				
Counties—				
Cattaraugus.....	Mar. 1-31.....	5		
Cayuga.....	do.....	8		
Cortland.....	do.....	9		
Dutchess.....	do.....	2		
Erie.....	do.....	1		
Franklin.....	do.....	2		
Genesee.....	do.....	1		
Jefferson.....	do.....	1		
Monroe.....	do.....	8		
New York.....	do.....	1		
Ontario.....	do.....	1		
Schuyler.....	do.....	1		
Steuben.....	do.....	4		
Tompkins.....	do.....	1		
Wayne.....	do.....	4		
Wyoming.....	do.....	5		
Total for State.....		54		
Oregon.....	Oct. 1-31.....	5		Not included in previous reports.
Do.....	Nov. 1-30.....	6		
Do.....	Dec. 1-31.....	13	1	
Total for State.....		24	1	

SMALLPOX IN THE UNITED STATES—Continued.

Reports Received during week ended May 10, 1912.

Places.	Date.	Cases.	Deaths.	Remarks.
Pennsylvania.....	Feb. 1-29.....	35	1	
Do.....	Mar. 1-31.....	22		
Total for State.....		57	1	
*Tennessee:				
Chattanooga.....	Apr. 21-27.....	1		
Knoxville.....	do.....	5		
Nashville.....	do.....	1		
Total for State.....		7		
Texas.....	Dec. 1-31.....	1	10	Omitted from report, p. 170.
Counties—				
Brazoria.....	Mar. 1-31.....	1	1	
Brown.....	do.....	1		
Coleman.....	do.....	3	1	
Goliad.....	Jan. 1-Mar. 31.....	32	1	
Johnson.....	Mar. 1-31.....	1		
Jones.....	do.....	1		
Lamar.....	do.....	9		
Marion.....	do.....	1		
McCulloch.....	do.....	10	4	
McLennan.....	do.....	1		
San Patricio.....	do.....	5		
Tarrant.....	do.....	126	34	
Travis.....	do.....	2		
Upshur.....	do.....	15		
Total for State.....		208	41	
Washington:				
Counties—				
Asotin.....	Feb. 1-29.....	17		
Chelan.....	do.....	13		
Clark.....	do.....	1		
King.....	do.....	5		
Klickitat.....	do.....	11		
Lincoln.....	do.....	4		
Pacific.....	do.....	4		
Pend Oreille.....	do.....	1		
Pierce.....	do.....	16		
Skagit.....	do.....	6		
Spokane.....	do.....	68		
Stevens.....	do.....	2		
Walla Walla.....	do.....	10		
Whitman.....	do.....	1		
Yakima.....	do.....	2		
Total.....		161		
Chelan.....	Mar. 1-31.....	2		
Clark.....	do.....	3		
Columbia.....	do.....	1		
Garfield.....	do.....	2		
Grant.....	do.....	51		
King.....	do.....	7		
Klickitat.....	do.....	5		
Pacific.....	do.....	1		
Pierce.....	do.....	47		
Skagit.....	do.....	1		
Spokane.....	do.....	68		
Whatcomb.....	do.....	1		
Yakima.....	do.....	3		
Total for State.....		192		
Grand total for the United States.....		757	54	

MORBIDITY AND MORTALITY.

MORBIDITY AND MORTALITY TABLE, CITIES OF THE UNITED STATES, FOR WEEK ENDED APR. 20, 1912.

Cities.	Popula- tion. United States Census 1910.	Total deaths from all causes.	Diph- theria.		Measles.		Scarlet fever.		Small- pox.		Tuber- culosis.		Ty- phoid fever.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cities having over 500,000 inhabitants.														
Baltimore, Md.	558,485	175	30	1	12	12	1				63	30	12	
Boston, Mass.	670,585	259	21		165	4	23	1			70	26	4	
Chicago, Ill.	2,185,283	666	126	15	189	3	251	16	2		150	76	9	2
Cleveland, Ohio.	560,663	172	26	5	53		30	3			42	15	2	1
New York, N. Y.	4,766,883	1,562	271	38	1,704	24	483	28	1		451	192	25	2
Philadelphia, Pa.	1,549,008	483	93	11	23		101	3			103	52	9	4
Pittsburgh, Pa.	533,905	165	11	1	72	2	27				42	17	4	2
St. Louis, Mo.	687,029	245	22	3	40		19		3		42	26	6	1
Cities having from 300,000 to 500,000 inhabitants.														
Cincinnati, Ohio.	364,463	132	8		25		19	1	1		35	20	2	2
Detroit, Mich.	465,766	170	14	2			34	1	1					
Los Angeles, Cal.	319,198	126	4		8		15		1		6	23	3	2
Milwaukee, Wis.	373,857	118	8		105		20	4			16	8	2	1
Newark, N. J.	347,469	97	12		130	1	15				35	13	1	
New Orleans, La.	339,075	140	3		6		11	1	10		27	22	6	2
San Francisco, Cal.	416,912	122	3		40	4	7		3		23	20	2	
Washington, D. C.	331,069	122	4		63		5				29	14	6	
Cities having from 200,000 to 300,000 inhabitants.														
Denver, Colo.	213,381	47	3		2		6		1			11		1
Jersey City, N. J.	267,779	71		1		1						12		
Kansas City, Mo.	248,381	41	3		5	1	4				5	13	1	
Providence, R. I.	224,326		8	2	26	7	16					7	2	
Seattle, Wash.	237,194	47	1		23		5		4		9	4		1
Cities having from 100,000 to 200,000 inhabitants.														
Bridgeport, Conn.	102,054	28	1		2		3				9	3		
Cambridge, Mass.	104,839	28	5		91	1	2				6	3	2	
Columbus, Ohio.	181,548	61	4		20		7				20	9	3	
Dayton, Ohio.	116,577	40		46	46				9		1	7	1	
Fall River, Mass.	119,295	37	2		1		1				7	4	3	
Grand Rapids, Mich.	112,571	32			2		8				5	1	1	
Lowell, Mass.	106,294	40			8		4				5	2	1	
Nashville, Tenn.	110,364	44	1				5				6	2	2	
Omaha, Nebr.	124,066	29	1	1	1		1					1	1	
Richmond, Va.	127,628	54	2		77		2		1		5	8		
Spokane, Wash.	104,402				33				9			1	1	1
Toledo, Ohio.	168,497	51	4	1	67	1						9	2	
Worcester, Mass.	145,986	42	5	1	10		5	1			7	1		
Cities having from 50,000 to 100,000 inhabitants.														
Altoona, Pa.	52,127	13	2				1				1	2		
Bayonne, N. J.	55,545	13						1				2		
Brockton, Mass.	56,878	18	1		55	1	1				1	1		
Camden, N. J.	94,538		2				2				14		1	
Duluth, Minn.	78,466	14	1		1		11				1	1		
Erie, Pa.	66,525	20	4		4		7				2	3	1	
Evansville, Ind.	69,647	13	1		1		4					3	4	
Fort Wayne, Ind.	63,933	14			9		1				11			
Harrisburg, Pa.	64,186	26	4		207	1			1		6		1	
Hartford, Conn.	98,915	34	11	2	33		11				5	1		
Hoboken, N. J.	70,324				4		1				5	2		
Johnstown, Pa.	55,482	30	4				1					2		
Kansas City, Kans.	82,331		1		5						3		2	
Lawrence, Mass.	85,892	31	4		9		5	1			6	6		
Lynn, Mass.	89,336	22	2		8		7	1			1	1		

¹ Pulmonary.

MORBIDITY AND MORTALITY—Continued.

Morbidity and mortality table, cities of the United States, for week ended Apr. 20, 1912—Continued.

Cities.	Popula- tion, United States Census 1910.	Total deaths from all causes.	Diph- theria.		Measles.		Scarlet fever.		Small- pox.		Tuber- culosis.		Ty- phoid fever.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cities having from 50,000 to 100,000 inhabitants—Continued.														
Manchester, N. H.	70,063	21			8		2				1	1		
New Bedford, Mass.	96,652	35			5		3				8	2	1	
Oklahoma City, Okla.	64,205	18										1		
Passaic, N. J.	54,773	19	2	1	27					3		1		
Pawtucket, R. I.	51,622			1					1			1		
Reading, Pa.	96,071	27	6	2	2		2					1	1	
Saginaw, Mich.	50,510	19	3		1		2				1	1		
San Antonio, Tex.	96,614	61	1		4				1			9	3	
Schnectady, N. Y.	72,826	21	4		81						1	3		
South Bend, Ind.	53,684											1	1	
Springfield, Ill.	51,678						2					1	3	
Springfield, Mass.	88,926	36	4		17		1				6	3		
Trenton, N. J.	96,815	34	2				4				11	3	1	
Wilkes-Barre, Pa.	67,105	23	4		5						9			
Wilmington, Del.	87,411	34										1		
Yonkers, N. Y.	79,803	19	10	2	15		7				7	1		
Cities having from 25,000 to 50,000 inhabitants.														
Atlantic City, N. J.	46,150	13	1		1		2						1	
Auburn, N. Y.	34,668	14					2				1	2		
Aurora, Ill.	29,807	13										1		
Berkeley, Cal.	40,434	5			27						1			
Binghamton, N. Y.	48,443	23	2	1	2		1				2	2	3	
Brookline, Mass.	27,792	10			6		1				2			
Chattanooga, Tenn.	44,604		1						1		3			
Chelsea, Mass.	32,452	12	1		26		2				4			
Chicopee, Mass.	25,401	10	1		5		1				2	1		
Danville, Ill.	27,871	9	1		4							2		
East Orange, N. J.	34,371	10	4		20		1					1		
Elmira, N. Y.	37,176	10	1		7									
El Paso, Tex.	39,279	31					1				1	7	1	1
Everett, Mass.	33,484	7			21						5	1		
Fitchburg, Mass.	37,826	14	1				4				1	1		
Haverhill, Mass.	44,115	15	1		9						3	1	1	
Kalamazoo, Mich.	39,437	14							3		1			
Knoxville, Tenn.	36,346	11			9				2			2		
La Crosse, Wis.	30,417	12	3	1			1		2			1		
Lexington, Ky.	35,099	19			2		1				4	2		1
Lima, Ohio	30,508	10			2		1					1		
Lynchburg, Va.	29,494	6			39		2				3	2		
Malden, Mass.	44,404	10			8		2					3		
Newcastle, Pa.	36,280		3				1						1	
Newport, Ky.	30,309	12					7				1	1		
Newton, Mass.	39,806	13			45						1			
Niagara Falls, N. Y.	30,445	14	2				2		5			2		
Norristown, Pa.	27,875	6	1		7		1					1		
Orange, N. J.	29,630		2	3	6		6				2	1		
Pasadena, Cal.	30,291	10	3	1										
Pittsfield, Mass.	32,121	6	5		2		1				4			
Portsmouth, Va.	33,190	11							5					
Racine, Wis.	38,002	10	2									2		
Roanoke, Va.	34,874	14			26		1				4	2	1	
Rockford, Ill.	45,401	22	1				6					6	10	1
Salem, Mass.	43,697	12							26			1		
San Diego, Cal.	39,578	4			3		6		3		4	3		
South Omaha, Nebr.	26,259	17	1											
Superior, Wis.	40,384	8										2		
Taunton, Mass.	34,259	15	2	1			1				2	1		
Waltham, Mass.	27,834				43						1		2	
West Hoboken, N. J.	35,403		4		2		3				2			
Williamsport, Pa.	31,860	5			23						1	1		
York, Pa.	44,750		2		1						4		1	
Zanesville, Ohio.	28,026	12					1					1		

MORBIDITY AND MORTALITY—Continued.

Morbidity and mortality table, cities of the United States, for week ended Apr. 20, 1912—Continued.

Cities.	Popula- tion, United States census 1910.	Total deaths from all causes.	Diph- theria.		Measles.		Scarlet fever.		Small- pox.		Tuber- culosis.		Ty- phoid fever.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
<i>Cities having less than 25,000 inhabitants.</i>														
Alameda, Cal.	23,833	5			15								1	
Ann Arbor, Mich.	14,817	16			2						4			
Beaver Falls, Pa.	12,191												2	1
Bennington, Vt.		4			3		1							
Braddock, Pa.	19,357	4	3	1										
Cambridge, Ohio.	11,327	2												
Carbondale, Pa.	17,040	5			21		2							
Clinton, Mass.	13,075	4												
Coffeyville, Kans.	12,687												1	
Columbus, Ga.	20,554	4												
Columbus, Ind.		0							5					
Concord, N. H.	21,497	5	1		11	1						1		
Cumberland, Md.	21,839	6			48							1		
Dunkirk, N. Y.		5									2		1	
Galesburg, Ill.	20,089	6									1		1	
Gloucester, Mass.	24,398	4									1			
Harrison, N. J.	14,498	3												
Homestead, Pa.	18,713	6			1							1	1	
Kearny, N. J.	18,659	9			6		3		1			1	1	
La Fayette, Ind.	20,081	5												
Logansport, Ind.	19,050	9					1		1				12	2
Marinette, Wis.	14,610	5												
Marlboro, Mass.	14,577	3	1	1	2									
Massillon, Ohio.		3												
Medford, Mass.	23,156	3			22		1				1			
Melrose, Mass.	15,715		1		16									
Moline, Ill.	24,199	10												
Montclair, N. J.	21,150	4			13		3				3			
Morristown, N. J.	12,507	3			4		2							
Nanticoke, Pa.	18,507	4	1									1		
Newburyport, Mass.	19,240	5					1					1	1	
North Adams, Mass.	22,012	5			4						1			
Northampton, Mass.	19,431	6			7		1					1		
Plainfield, N. J.	20,550	6			36		2							
Pottstown, Pa.	15,599	5												
Rutland, Vt.	13,546	4			1									
Saratoga Springs, N. Y.		4									1			
South Bethlehem, Pa.	19,973	9			7						1	1	1	
Steelton, Pa.	14,246	5			2				2					
Warren, Pa.	11,080	4					1					2	1	
Wilkinsburg, Pa.	18,924	6					1				3			
Woburn, Mass.	15,308	2			13		1				4	1		

STATISTICAL REPORTS OF MORBIDITY AND MORTALITY, STATES OF THE UNITED STATES (Untabulated).

FLORIDA.—Week ended April 22, 1912. Reports from the State board of health show diphtheria present in 3 localities with 5 cases, malaria in 3 localities with 29 cases, smallpox in 5 counties with 34 cases, tuberculosis in 9 localities with 14 cases, typhoid fever in 4 localities with 7 cases.

IOWA.—Month of February, 1912. Population, 2,224,771. Total number of deaths from all causes 1,894, including diphtheria 11, measles 1, scarlet fever 5, tuberculosis 125, typhoid fever 18.

MARYLAND.—Month of March, 1912. Population, 1,295,346. Total number of deaths from all causes from infectious diseases

include diphtheria 15, measles 3, tuberculosis 89, typhoid fever 13. Cases reported: Diphtheria 41, measles 168, scarlet fever 59, typhoid fever 54. The typhoid fever cases were distributed as follows: Potomac River watershed 18, Patapsco River watershed 8 cases, Patuxent River watershed 3 cases, Herring Run watershed 2 cases.

NEW JERSEY.—Month ended April 10, 1912. Population, 2,537,167. Total number of deaths from all causes 3,344, including diphtheria 36, measles 37, scarlet fever 18, tuberculosis 429, typhoid fever 14.

NORTH DAKOTA.—Month of March, 1912. Population, 577,056. Total number of deaths from all causes 311, including scarlet fever 1, tuberculosis 1, typhoid fever 1. Cases reported: Diphtheria 13, measles 5, scarlet fever 25, smallpox 23, tuberculosis 9, typhoid fever 14.

PENNSYLVANIA.—Month of January, 1912. *Mortality*.—Total number of deaths, 10,345, including typhoid fever 128, scarlet fever 38, diphtheria 274, measles 73, whooping cough 63, smallpox 1, influenza 157, malaria 3, tuberculosis of the lungs 822, tuberculosis of other organs 111, cancer 452, diabetes 74, meningitis 43, acute anterior poliomyelitis 3, pneumonia 1,594, diarrhea and enteritis under 2 years 153, diarrhea and enteritis over 2 years 62, Bright's disease 654, early infancy 587, suicide 70, accidents in mines 106, railway injuries 134 other forms of violence 476, all other diseases 4,267.

Morbidity.—Month of February, 1912. Total number of cases of communicable diseases reported, 11,988, including anterior poliomyelitis 4, anthrax 1, cerebrospinal meningitis 14, chicken pox 1,530, diphtheria 1,139, erysipelas 192, German measles 39, malarial fever 6, measles 3,569, mumps 887, pneumonia 837, puerperal fever 2, scarlet fever 949, smallpox 35, tetanus 4, trachoma 1, tuberculosis 1,145 typhoid fever 575, whooping cough 1,069.

FOREIGN AND INSULAR.

SANITARY SURVEILLANCE OF VESSELS AT MEXICAN PORTS.

Under the provisions of section 2 of the act of February 15, 1893, "An act granting additional quarantine powers and imposing additional duties upon the Marine Hospital Service," Acting Asst. Surg. J. A. Campbell has been assigned to duty in the office of the American consul at Vera Cruz, and Acting Asst. Surg. C. Milo Brady has been detailed in the office of the American consul at Tampico.

Under this assignment these officers will sign bills of health in connection with the American consuls, and during the close quarantine season will fumigate vessels destined to United States ports, prior to their departure from the above-named ports. They will also transmit regularly information concerning the sanitary status of said ports and the country contiguous thereto.

BRAZIL.

Bahia—Yellow Fever.

Vice Consul Mueller reports March 25 the occurrence of 6 cases of yellow fever, with 1 death at Bahia.

CHILE.

Yellow Fever.

Consul Winslow at Valparaiso reports April 6: Yellow fever is still reported prevalent at Tocopilla, with a total to date of 90 cases, with 25 deaths.

CHINA.

Hongkong—Plague—Smallpox.

Surg. Brown reports: During the week ended March 16, 1912, 10 cases of plague, with 9 deaths, and 36 cases of smallpox, with 27 deaths, were reported at Hongkong, and during the week ended March 23, 20 cases of plague, with 18 deaths, and 30 cases of smallpox, with 25 deaths.

Plague-infected Rats.

During the two weeks ended March 23, 1912, 3,804 rats were examined for plague infection. Three plague-infected rats were found.

GREECE.

Cerebrospinal Meningitis.

Consul General Gale reports: During the week ended April 6, 180 cases of cerebrospinal meningitis were reported in Greece, occurring in 34 localities and during the week ended April 13, 28 cases occurring in 12 localities. The reports for the week ended April 13 are incomplete.

HAWAII.

Record of Plague Infection.

The last case of human plague at Honolulu occurred July 12, 1910. The last plague-infected rat was found at Aiea, 9 miles from Honolulu, April 12, 1910.

A case of human plague was reported at Kapulena, Hawaii, October 28, 1911.

At Hilo the last case of human plague occurred March 23, 1910. At Honokaa, 60 miles from Hilo, a fatal case occurred February 9, 1912; 2 fatal cases February 25, 1912; and a fatal case March 18, 1912. During the week ended March 2, 1912, 49 plague-infected rats were found. The last plague-infected rat was found April 17, 1912. At Hilo a plague-infected rat was found during the week ended June 10, 1911, and 2 plague-infected rats were reported found February 29, 1912.

Honolulu—Plague-prevention Work.

Chief Quarantine Officer Trotter reports:

Week ended Apr. 13, 1912.

Total rats and mongoose taken.....	544
Rats trapped.....	538
Mongoose trapped.....	6
Rats examined bacteriologically.....	460
Classification of rats trapped:	
<i>Mus alexandrianus</i>	26
<i>Mus musculus</i>	96
<i>Mus norvegicus</i>	43
<i>Mus rattus</i>	373
Average number of traps set daily.....	1,720

ITALY.

Rome—Smallpox.

According to information received from the American Embassy, smallpox was reported present in Rome during the three months ended March 31, 1912, as follows: January, 4 cases with 1 death; February, 16 cases with 2 deaths; March, 11 cases.

Examination of Emigrants.

Passed Asst. Surg. Robinson, at Naples, reports:

Vessels inspected at Naples, Messina, and Palermo, week ended April 20:

NAPLES.

Date.	Name of ship.	Destination.	Steerage passengers inspected and passed.	Pieces of baggage inspected and passed.	Pieces of baggage disinfected.
Apr. 15	San Guglielmo.....	New York.			
18	do.....	do.....	1,252	140	1,380
19	Mendoza.....	do.....	726	55	950
19	Konig Albert.....	do.....	1,181	145	1,620
	Total.....		3,159	340	3,950

MESSINA.

Date.	Name of ship.	Destination.	Steerage. passengers inspected and passed.	Pieces of baggage inspected and passed.	Pieces of baggage disinfected.
Apr. 16	San Guglielmo	New York	343	69	459

PALERMO.

Apr. 17	Alice.....	New York.....
17	San Guglielmo.....	do.....	387	300	200
18	Mendoza.....	do.....	95	130	50
	Total.....	482	430	250

MEXICO.

Typhus Fever.

At Acapulco, Consul Edwards reports the occurrence of 1 death from typhus fever during the week ended April 13.

At Aguascalientes Consul Schmutz reports 1 new case of typhus fever and 4 deaths from the same disease for the week ended April 21.

At Saltillo the American consul reports May 3 the presence of 5 cases of typhus fever.

RUSSIA.

Typhus Fever.

At Moscow Consul General Snodgrass reports the occurrence of 7 cases of typhus fever with 3 deaths.

At Odessa Consul Grout reports the occurrence of 52 cases of typhus fever with 2 deaths during the week ended March 30.

VENEZUELA.

La Guaira—Yellow Fever.

Acting Asst. Surg. Stewart reports: During the two weeks ended April 1, 2 deaths from yellow fever occurred at La Guaira.

WEST INDIES.

Trinidad—Plague.

The American consul reported May 1 the presence of a case of plague at Port of Spain.

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX.

REPORTS RECEIVED DURING THE WEEK ENDED MAY 10, 1912.

[These tables include cases and deaths recorded in reports received by the Surgeon General, Public Health and Marine-Hospital Service, from American consuls through the Department of State and from other sources.]

CHOLERA.

Places.	Date.	Cases.	Deaths.	Remarks.
India:				
Bassein.....	Mar. 10-16.....	3	2	
Moulmine.....	do.....	2	2	
Indo-China:				
Saigon.....	Mar. 12-18.....	24	16	
Siam:				
Bangkok.....	Jan. 28-Mar. 24.....		489	
Turkey in Asia:				
Aleppo.....	Apr. 6-13.....	5	2	

YELLOW FEVER.

Venezuela:				
La Guaira.....	Mar. 17-Apr. 1....	2	2	

PLAGUE.

Chile:				
Iquique.....	Mar. 24-Apr. 6....	3		
China:				
Hongkong.....	Mar. 10-23.....	30	27	
Peru:				
Salaverry.....	Mar. 27-Apr. 3....	2		
Trujillo.....	Apr. 10.....			22 cases in the lazaretto.
Siam:				
Bangkok.....	Feb. 25-Mar. 23...		2	
Straits Settlements:				
Singapore.....	Mar. 3-16.....	2	1	
Trinidad				
Port of Spain.....	May 1.....	1		
Venezuela:				
Caracas.....	Mar. 27-Apr. 13...		2	

SMALLPOX.

Austria-Hungary:				
Galicia.....	Mar. 31-Apr. 6....	3		
Trieste.....	do.....	1		
Canada:				
Hamilton.....	Apr. 21-27.....	8		
Montreal.....	do.....	3		
Ottawa.....	Apr. 14-20.....	6	1	
Quebec.....	Apr. 21-27.....	13		
Vancouver.....	Apr. 14-20.....	1		
Winnipeg.....	do.....	1		
China:				
Dalny.....	Mar. 24-30.....	1		
Hongkong.....	Mar. 10-23.....	66	52	
Germany.....	Apr. 14-20.....	16		
Hamburg.....	Apr. 7-13.....	1		
Great Britain:				
London.....	Apr. 7-20.....	2		
Indo-China:				
Saigon.....	Mar. 12-18.....	1		
Italy:				
Genoa.....	Apr. 1-15.....	2		
Naples.....	Apr. 14-20.....	3		
Palermo.....	Apr. 7-13.....	16	5	
Rome.....	Jan. 1-31.....	4	1	
Do.....	Feb. 1-29.....	16	2	
Do.....	Mar. 1-31.....	11		
Mexico:				
Juarez.....	Apr. 21-27.....	2		
San Luis Potosi.....	Feb. 18-24.....	2	1	

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued.

Reports Received during week ended May 10, 1912.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Russia:				
Libau.....	Apr. 8-14.....	1		
Odesa.....	Mar. 24-Apr. 6.....	3		
Riga.....	Mar. 17-Apr. 13.....	11		
Warsaw.....	Feb. 18-24.....	13	2	
Siam:				
Bangkok.....	Jan. 28-Mar. 23.....		849	
Spain:				
Cadiz.....	Mar. 1-31.....		2	
Straits Settlements:				
Singapore.....	Mar. 3-16.....	4	2	
Turkey in Europe:				
Constantinople.....	Apr. 8-14.....		21	

REPORTS RECEIVED FROM DEC. 30, 1911, TO MAY 3, 1912.

[For reports received from July 1, 1911, to Dec. 29, 1911, see PUBLIC HEALTH REPORTS for Dec. 29, 1911. In accordance with custom, the tables of epidemic diseases are terminated semiannually and new tables begun.]

CHOLERA.

Places.	Date.	Cases.	Deaths.	Remarks.
Arabia:				
Hodeida.....	Jan. 21.....	2	1	
Ras-el-Ketib.....	Dec. 27-Jan. 1.....			Total cases, 22; deaths, 12; mainly in the military hospital.
Austria-Hungary:				
Coastland—				
Capodistria.....	Dec. 14-24.....	2	2	
Croatia and Slavonia.....				Total Oct. 22-Dec. 16: Cases, 36.
Sriem.....	Oct. 22-Dec. 16.....	36		
Hungary.....				Total Nov. 19-Dec. 23: Cases, 37. Free Dec. 28.
Backs-Bodog.....	Dec. 10-16.....	9	5	
Jasz-Nagykun-Szolnok.....	Dec. 3-23.....	11	7	
Torontal.....	Nov. 19-Dec. 16.....	17	2	
Bahrein Island.....	Nov. 27-Dec. 30.....		200	In the Persian Gulf.
Bulgaria:				
Burgas.....	Nov. 22-23.....	2	2	
Varna.....	Nov. 6.....	1		
China:				
Hongkong.....	Jan. 14-20.....	1	1	
Dutch East Indies.....				Total year 1911: Cases, 3,624; deaths, 2,919, including report, p. 2092, vol. 1. Free Dec. 31.
Batavia.....	Nov. 12-Dec. 23.....	21	8	Year 1911: Deaths, 323,237.
India:				
Bassein.....	Jan. 14-Mar. 9.....	113	94	
Calcutta.....	Nov. 5-Mar. 16.....		944	
Madras.....	Nov. 26-Mar. 30.....	548	446	Madras Presidency, Nov. 1-Dec. 31: Cases, 10,436; deaths, 6,545; Jan. 1-Feb. 29: Cases, 18,267; deaths, 11,563.
Moulmine.....	Feb. 18-24.....	2	2	
Negapatam.....	Jan. 14-Feb. 24.....		79	
Pondicherry.....	Feb. 22-28.....	4	4	
Rangoon.....	Oct. 1-Feb. 29.....	104	86	
Indo-China:				
Saigon.....	Nov. 20-Mar. 4.....	1,520	1,066	
Italy.....				Total June 8-Dec. 31: Cases, 15,985; deaths, 6,022.
Caltanissetta.....	Nov. 26-Dec. 31.....	9	7	
Girgenti.....	do.....	105	57	
Messina.....	Nov. 26-Dec. 2.....	3	2	
Syracuse.....	Nov. 26-Dec. 23.....	15	9	
Malta.....	Nov. 19-Dec. 10.....	6	6	Dec. 23 declared free from cholera.
Montenegro.....	Nov. 4-11.....	9	5	
Persia:				
Adaban.....	Nov. 4.....	1	1	
Kermanshah.....	Dec. 18-26.....		37	

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued.

Reports Received from Dec. 30, 1911, to May 3, 1912.

CHOLERA—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Philippine Islands.....				Third quarter, 1911: Manila 1, fatal case; Provinces, 27 cases and 22 deaths. Fourth quarter, 1911: Manila, no case and no death; Provinces, 22 cases, 20 deaths.
Province— Union.....	Oct. 29-Dec. 4....	5	5	
Roumania.....				Total Sept. 9-Dec. 13: Cases, 192; deaths, 42, including report, p. 2094, vol. 1. Free Dec. 19.
Districts— Braila.....	Sept. 11-Dec. 13...	84	11	Including cases previously reported.
Convoluri.....	Oct. 31-Nov. 28...	21	1	
Dolju.....	Nov. 6-Dec. 13...	19	4	
Jalonitza.....	Oct. 31-Nov. 28...	4		
Konstanza.....	Oct. 30-Nov. 28...	8		
Prahova.....	Nov. 6-23.....	1	1	
Talomita.....	do.....	2		
Tulcea.....	Nov. 24-Dec. 13...	15	1	
Servia.....				Total year 1911: Cases, 95; deaths, 51, including report, p. 2096, vol. 1. Declared free Dec. 31.
Belgrade district.....	Nov. 26-Dec. 16...	6	4	
Siam: Bangkok.....	Nov. 5-Jan. 27.....		755	
Straits Settlements: Singapore.....	Nov. 5-Feb. 3.....	4	4	
Tripoli: Tripoli.....	Oct. 13-Jan. 24.....			Cases, 2,000; deaths, from 1,000 to 1,200.
Tunis Regency.....				Total Nov. 25-Jan. 4: Cases, 462; deaths, 323. No cases since Jan. 10.
Beja district.....	Nov. 25-Dec. 21...	71	20	
Bizerta district.....	Nov. 25-Dec. 5....	9	15	
Turkey in Asia.....				Provinces in Asia and Europe, Apr. 16-Dec. 30, 1911: Deaths, 6,111, excluding Constantinople. Mainly among troops. Jan. 6-Feb. 27: Cases, 101; deaths, 126.
Acre.....	Jan. 21.....		33	In vicinity.
Adana.....	Dec. 2-Mar. 20....	21	5	
Aleppo.....	Jan. 26-Mar. 9....	36	23	
Amara.....	Oct. 15.....	1	1	
Basra.....	Oct. 22-28.....	14	10	
Erzeroum, vilayet.....	Sept. 11-16.....	50	28	
Erzeroum.....	do.....	11	8	
Kaifa.....	Dec. 8.....			Present.
Kerbelah.....	Oct. 20-28.....	10	10	
Kharput.....	Nov. 19-Dec. 30...	47	47	
Jiddah.....	Dec. 2-24.....	323	310	
Mekka.....	Dec. 4-24.....	905	879	Sept. 1-Dec. 24: Cases, 1,648; deaths, 1,565.
Mersina.....	Dec. 1-7.....	2	1	
Osmania.....	Dec. 1-6.....	2	4	
Sinope.....	Dec. 7.....	2	1	
Tor.....	Dec. 14-26.....	29		
Trebizond and vicinity.....	Sept. 18-23.....	64	34	
Tripoli.....	Jan. 4.....			Present.
Turkey in Europe: Constantinople.....	Oct. 24-Feb. 3....	8	2	
Durazzo.....	Dec. 7-13.....	2		
Janina.....	Jan. 14-22.....	17	8	
Loros.....	Jan. 22.....	12	7	
Saloniki, vilayet.....	Nov. 6-19.....	4	3	In Serres.

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued.

Reports Received from Dec. 30, 1911, to May 3, 1912.

YELLOW FEVER.

Places.	Date.	Cases.	Deaths.	Remarks.
Brazil:				
Bahia.....	Mar. 23-25.....	6	1	
Ceara.....	Jan. 1-Feb. 29.....		5	
Manaos.....	Nov. 19-Mar. 30.....		54	
Para.....	Mar. 3-9.....	2	2	Dec. 9-16: 1 fatal case.
Pernambuco.....	Jan. 1-Mar. 15.....		14	
Canal Zone:				
Culebra Island quarantine.....	Jan. 1-31.....	1		From a vessel from Guayaquil.
Chile:				
Tocopilla.....	Apr. 11.....	90	25	And vicinity.
Ecuador:				
Bucay.....	Nov. 16-Feb. 29.....	7	2	
Duran.....	Dec. 1-Feb. 29.....	13	6	
Guayaquil.....	Nov. 16-Feb. 29.....	118	54	
Huigra.....	Feb. 1-29.....			1 case.
Milagro.....	do.....	16	7	
Naranjito.....	do.....	2	2	
Yaguachi.....	do.....			1 case.
Mexico:				
Espita.....	Dec. 31-Jan. 6.....	1		
Kambul, hacienda.....	Feb. 21-27.....		7	
Maxcanu.....	Dec. 31-Jan. 6.....	1		
Merida.....	Nov. 12-Mar. 23.....	20	9	Total Aug. 1-Mar. 23: Cases, 65; deaths, 29.
Puerto Mexico (Coatzacoalcos).....	Feb. 28.....		1	
Salina Cruz.....	Feb. 4-7.....			7 cases in the lazaretto from s. s. Ikalis from Guayaquil.
Temax.....	Dec. 31-Jan. 6.....	1		
Portuguese Guinea:				
Bolama.....	Dec. 19-25.....	1	1	In an engineer on a vessel.
Venezuela:				
Caracas.....	Nov. 16-Feb. 15.....	30	13	
Macutó.....	Mar. 16-19.....	1	1	
Maiquetia.....	Feb. 24-Mar. 9.....	3	1	A suburb of La Guaira.
Sabana Grande.....	Dec. 12.....			Epidemic.
West Indies:				
St. Vincent.....	Feb. 19.....	1		
At sea.....	Dec. 17-23.....	1	1	On a vessel en route from Manaos to Para.

PLAGUE.

Algeria:				
Philippeville.....	Oct. 19-Nov. 11.....	8	2	Including 5 cases, p. 2096, Vol. XXVI.
Arabia:				
Aden.....	Mar. 5-25.....	2	1	
Azores:				
Fayal.....	Jan. 10.....			Still present.
Terceira.....	do.....			Do.
Brazil:				
Bahia.....	Sept. 1-30.....		2	
Para.....	Dec. 24-Apr. 6.....	20	13	
Pernambuco.....	Oct. 1-Feb. 29.....		9	
Rio de Janeiro.....	Nov. 12-Feb. 10.....	7	3	
British East Africa:				
Kismayu.....	Oct. 15-25.....	2		1 case pneumonic.
Chile:				
Iquique.....	Nov. 12-Mar. 27.....	21	11	
Pisagua.....	Nov. 1-30.....	8		
China:				
Amoy.....	Jan. 13.....		1	
Chaochowfu.....	Mar. 10-16.....			Present.
Hongkong.....	Dec. 9-Mar. 9.....	50	44	
Dutch East Indies:				
Java.....				Total Mar. 1-Dec. 30: Cases, 1,817; deaths, 1,324. Dec. 31-Feb. 9: Cases, 65, deaths, 63.
Paserocean Residency, Malang District.....	Nov. 12-Mar. 23.....	116	72	
Soerobaya.....	Oct. 17-27.....	2		
Ecuador:				
Duran.....	Feb. 1-29.....	1		
Guayaquil.....	Nov. 16-Feb. 29.....	124	52	Dec. 16-Jan. 31: Reports not available because of revolution.

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued.

Reports Received from Dec. 31, 1911, to May 3, 1912.

PLAGUE—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Egypt.....				Total Jan. 1-Dec. 31, 1911: Cases, 1,656; deaths, 1,041, including cases previously reported.
Alexandria.....	Mar. 22.....	1	1	
Provinces—				
Assiout.....	Jan. 1-Mar. 22.....	50	32	Sept. 11-16: Cases, 50; deaths, 28.
Assouan.....	Jan. 1-Mar. 22.....	29	18	
Behera.....	Jan. 1-Mar. 16.....	4	2	Sept. 11-16: Cases, 11; deaths, 8.
Beni Souef.....	Feb. 16-Apr. 4.....	23	7	
Fayoum.....	Jan. 1-26.....	1		
Galioubeh.....	Jan. 1-Mar. 10.....	4	3	Oct. 5-Dec. 26: Case, 1.
Garbieh.....	Jan. 1-Mar. 17.....	18	8	
Girgeh.....	Mar. 28.....	1	1	
Kena.....	Jan. 1-Apr. 4.....	69	51	Nov. 20-Dec. 13: Cases, 3; deaths, 3.
Menouf.....	Feb. 2-Mar. 7.....	3	1	
Minieh.....	Jan. 1-Apr. 4.....	22	4	Dec. 13: Case, 1.
German East Africa:				
Dar-es-Salaam.....	Nov. 13-15.....	1	1	From the interior via Bergamogo.
Hawaii:				
Honakaa.....	Feb. 9-Mar. 18.....	4	4	
India:				
Bombay.....	Nov. 19-Mar. 23.....	419	375	
Calcutta.....	Nov. 11-Mar. 16.....		196	
Karachi.....	Nov. 26-Mar. 30.....	547	408	Total year 1911: Cases, 3,273; deaths, 3,046.
Madras.....	Jan. 1-6.....	1	1	
Rangoon.....	Oct. 1-Feb. 29.....	166	158	
Bombay Presidency and Sind.....	Oct. 29-Mar. 23.....	58,396	42,824	
Madras Presidency.....	do.....	10,129	7,869	
Bengal.....	do.....	37,491	31,764	
United Provinces.....	do.....	86,612	76,987	
Punjab.....	do.....	10,541	8,082	
Burma.....	do.....	1,428	1,302	
Eastern Bengal and Assam.....	Jan. 1-Feb. 24.....	2	2	
Central Provinces.....	Oct. 29-Mar. 23.....	26,600	21,144	
Coorg.....	do.....	88	52	
Mysore State.....	do.....	8,631	6,688	
Hyderabad State.....	do.....	25,820	23,394	
Central India.....	do.....	9,096	7,453	
Rajputana and Ajmere.....	do.....	1,533	1,234	
Merwara.....				
Kashmir.....	Feb. 3-Mar. 23.....	114	51	
North West Province.....	Oct. 29-Feb. 24.....	2	2	Total for India, Oct. 29-Mar. 23: Cases, 276,483; deaths, 228,848. Total year 1911: Cases, 828,535; deaths, 691,849.
Indo-China:				
Saigon.....	Nov. 13-Mar. 4.....	33	5	
Japan:				
Formosa.....	Mar. 7-16.....	13	7	
Mauritius.....	Nov. 3-Feb. 22.....	70	36	
Persia:				
Bushire.....	Feb. 4-Mar. 2.....	31	14	
Peru:				
Departments—				
Callao.....	Oct. 1-21.....	1		City, in November, 1 case; in January, 3 cases with 2 deaths; Mar. 1-26, 12 cases.
Chiclayo.....	do.....	12	4	
Chosica.....	do.....	1	1	
Lambayeque.....	do.....	3		
Libertad.....	do.....	8		Mar. 13, 30 cases in the lazaretto at Trujillo.
Lima.....	do.....	13	6	
Philippine Islands:				
Cebu quarantine station.....	Dec. 4.....	1		On s. s. Montrose from Shanghai.
Russian Empire:				
Astrakhan, government.....	Sept. 21-Jan. 7.....	201	180	Including 73 cases and 63 deaths reported on p. 2098, Vol. 1.
Siam:				
Bangkok.....	Nov. 4-Jan. 27.....		3	
South Africa:				
Durban.....	Jan. 14-Apr. 5.....			Total: Cases 24, deaths 19.
Straits Settlements:				
Singapore.....	Nov. 5-Feb. 24.....	27	24	

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued.

Reports Received from Dec. 30, 1911, to May 3, 1912.

PLAGUE—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Turkey in Asia:				
Basra.....	Feb. 13.....	1	1	A stoker on a vessel from Bushire.
Jiddah.....	Jan. 13-Mar. 13....	9	5	
Venezuela:				
Caracas.....	Mar. 12.....	1		Apr. 22, present.
West Indies:				
Trinidad.....	Apr. 2-26.....	5		
At sea.....	Mar. 1-11.....	1	1	On s. s. Macedonia from Bombay to Aden.

SMALLPOX.

Algeria:				
Algiers.....	Nov. 1-30.....		1	
Oran.....	Jan. 1-31.....	2	1	
Arabia:				
Aden.....	Nov. 28-Mar. 25....	18	9	And vicinity.
Argentina:				
Buenos Aires.....	Jan. 1-31.....		2	Oct. 1-31, 6 deaths. No deaths in Nov. or Dec., 1911.
Rosario.....	Oct. 1-Jan. 31.....		40	
Australia:				
Thursday Island.....	Jan. 2.....	1		From s. s. Taiyuan.
Austria-Hungary:				
Bohemia.....	Jan. 14-20.....	2		
Budapest.....	Jan. 4-10.....	25		
Galicia.....	Dec. 24-Mar. 30.....	25	1	
Krain.....	Jan. 14-20.....	7		
Trieste.....	Dec. 3-9.....	1		From s. s. Baron Call from Beirut.
Tyrol.....	Jan. 14-Mar. 9.....	3		
Vienna.....	Mar. 25-30.....	1		
Brazil:				
Bahia.....	July 1-31.....		1	
Para.....	Mar. 24-Apr. 6.....	2	1	Case Mar. 30 from Alagoas.
Pernambuco.....	Oct. 1-Mar. 15.....		732	
Rio de Janeiro.....	Nov. 26-Mar. 2.....	28	1	
Santos.....	Dec. 12-23.....		1	
Canada:				
British Columbia—				
Fernie.....	Feb. 26-Mar. 16....	5		
Nelson.....	Dec. 24-30.....	1		
Victoria.....	Feb. 4-10.....	1		
Manitoba—				
Winnipeg.....	Jan. 14-Apr. 13....	3		
Nova Scotia—				
Halifax.....	Mar. 24-Apr. 6.....	2		
Ontario—				
Hamilton.....	Apr. 14-20.....	8		
Kingston.....	Dec. 19-23.....	1		
Ottawa.....	Dec. 10-Mar. 23....	91		
Sarnia.....	Oct. 17-Mar. 23....	43		
Toronto.....	Jan. 6-Mar. 24.....	3	1	
Windsor.....	Feb. 4-Mar. 16.....	8		
Quebec—				
Montreal.....	Dec. 17-Apr. 13....	24		
Quebec.....	Dec. 10-Apr. 13....	270	2	
Yukon—				
Dawson.....	Apr. 1-6.....	1		
Ceylon:				
Colombo.....	Nov. 12-Feb. 10....	3		And vicinity.
Chile:				
Iquique.....	Dec. 10-Mar. 16....	4	2	
La Serena.....	Nov. 21-30.....	14		
Santiago.....	Nov. 1-30.....	685	343	
Talcahuano.....	Nov. 26-Dec. 23....	14	3	
Valparaiso.....	Dec. 3-Mar. 9.....	68		Feb. 17—Decreasing.
China:				
Canton.....	Nov. 11-Dec. 30....	40	6	
Chaochowfu.....	Mar. 30.....			Present.
Chenghai.....	Jan. 29-Mar. 30....			Do.
Chungking.....	Nov. 18-Mar. 16....			Do.
Dalny.....	Mar. 3-23.....	9	2	
Hankow.....	Jan. 21-Feb. 17....	2	1	
Hongkong.....	Nov. 12-Mar. 9.....	558	414	
Kityang.....	Jan. 21-Mar. 30....			Do.
Nanking.....	Dec. 10-Mar. 30....			Do.
Shanghai.....	Dec. 11-Feb. 18....	1	6	Deaths among natives.
Swatow.....	Mar. 2.....			Present.

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued.

Reports Received from Dec. 30, 1811, to May 3, 1912.

SMALLPOX—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Cuba:				
Habana.....	Dec. 19-Jan. 19....	2		Case Dec. 19 from German s. s. Frankenwald, from Spain and Canary Islands; case Jan. 19 from s. s. Mexico.
Dutch East Indies:				
Java—				
Batavia.....	Nov. 12-Mar. 23....	48	13	
Egypt:				
Cairo.....	Dec. 10-Mar. 25....	10	1	
Port Said.....	Jan. 30-Feb. 4.....	1		
France:				
Havre.....	Mar. 10-16.....		4	
Marseille.....	Jan. 1-Mar. 31.....		5	Nov. 1-30, 1 death.
Paris.....	Dec. 3-Apr. 6.....	118	2	
Germany.....				Total, Dec. 31-Apr. 13: Cases, 101
Hamburg.....	Jan. 21-Apr. 6.....	3		
Gibraltar.....	Feb. 27-Mar. 3.....	1		
Great Britain:				
Bristol.....	Jan. 29-Feb. 3.....	2		
Liverpool.....	Mar. 17-Apr. 17....	2	1	Case Apr. 13, an American from the s. s. Arabic.
London.....	Jan. 14-Apr. 6.....	8	1	
Southampton.....	Mar. 3-9.....	1		
West Hartlepool.....	Feb. 18-Mar. 9.....	2		
India:				
Bombay.....	Nov. 19-Mar. 23....	637	216	
Calcutta.....	Nov. 19-Mar. 16....		26	
Madras.....	Nov. 26-Mar. 30....	179	71	
Rangoon.....	Oct. 1-Feb. 29.....	220	55	
Indo-China:				
Saigon.....	Nov. 13-Mar. 4.....	37	7	
Italy:				
Genoa.....	Dec. 1-Mar. 15.....	45	2	
Leghorn.....	Dec. 16-Apr. 13....	101	1	
Messina.....	Nov. 19-Jan. 31....		6	
Naples.....	Dec. 3-Apr. 13.....	97	1	
Palermo.....	Nov. 26-Apr. 6.....	2,614	890	
Turin.....	Jan. 15-Apr. 7.....	2		
Japan:				
Arima-Mura.....	Nov. 12-18.....	6	1	11 miles east from Kobe.
Formosa.....	Mar. 3-16.....	3		
Kanagawa, ken.....	Dec. 17-23.....	1		
Kobe.....	Jan. 22-28.....	2	1	Jan. 20, 1 case from s. s. Suveric from Hongkong; Jan. 28, 1 case from Shingo Maru.
Nagasaki.....	Feb. 12-18.....	1		
Nogahama.....	Mar. 17-23.....	1		On s. s. Tenyo Maru from Hongkong.
Yokohama.....	Jan. 22.....	1		From s. s. Hydra from New York via Suez.
Malta.....	Dec. 24-Jan. 6.....	2	1	
Mexico:				
Agascalientes.....	Dec. 18-Mar. 3.....		7	
Chihuahua.....	Nov. 20-Feb. 11....	92	36	
Coahuila, State.....	Oct. 1-30.....		16	
Guadalajara.....	Jan. 14-Apr. 13....	8	4	
Juarez.....	Dec. 19-Mar. 9.....	14	5	
Magdalena.....	Dec. 23-Mar. 12....	91	50	Mar. 12, 10 cases present.
Manzanillo.....	Feb. 18-24.....	1		
Mazatlan.....	Dec. 11-Mar. 19....		11	Mar. 16, 25 cases in the lazaretto.
Mexico.....	Nov. 26-Mar. 2.....	167	79	
Monterey.....	Dec. 11-24.....		2	
Porfirio Diaz.....	Dec. 3-Mar. 23....		35	
Salina Cruz.....	Feb. 11-Mar. 9.....	4	2	Mar. 23, present in vicinity.
San Antonio.....	Jan. 1-21.....	12	9	
San Carlos.....	do.....			Present.
Sandoval.....	Dec. 16.....			Do.
San Ignacio.....	Jan. 8.....	3		
Saric.....	Jan. 21-27.....		6	
Santa Ana.....	Jan. 8.....	4		
San Luis Potosi.....	Nov. 12-Feb. 10....	4	1	
Tampico.....	Dec. 1-Mar. 30....		15	
Tapachula.....	Nov. 1-Jan. 31....		18	
Philippine Islands.....				Third quarter, 1911: Manila, 9 cases; no deaths. Fourth quarter, 1911: 38 cases.
Portugal:				
Lisbon.....	Dec. 9-Apr. 13....	55		

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued.

Reports Received from Dec. 30, 1911, to May 3, 1912.

SMALLPOX—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Russia:				
Batum.....	Dec. 1-31.....	1		
Libau.....	Dec. 17-23.....	1		
Moscow.....	Nov. 19-Mar. 23.....	52	8	
Odessa.....	Nov. 26-Mar. 23.....	31	1	
Reval.....	Nov. 1-30.....	1		
Riga.....	Dec. 24-Jan. 27.....	16		
St. Petersburg.....	Nov. 19-Mar. 23.....	170	36	
Warsaw.....	Nov. 5-Feb. 17.....	377	183	
Siam:				
Bangkok.....	Nov. 5-Jan. 27.....		1,326	
Siberia:				
Omsk.....	Jan. 1-31.....	7		
South Africa:				
Durban.....	Jan. 21-Feb. 24.....	4		
Johannesburg.....	Jan. 7-Feb. 10.....	36		
Spain:				
Barcelona.....	Feb. 6-12.....		1	
Cadiz.....	Nov. 1-Feb. 29.....		27	
Madrid.....	Dec. 1-Mar. 31.....		16	
Malaga.....	Nov. 1-30.....		45	
Seville.....	Dec. 1-Mar. 31.....		10	
Valencia.....	Dec. 3-Apr. 13.....	371	16	
Straits Settlements:				
Penang.....	Feb. 11-17.....	1		
Singapore.....	Nov. 19-Mar. 2.....	32	11	
Switzerland:				
Cantons—				
Oberwalden.....	Jan. 14-20.....	1		
Zurich.....	Dec. 3-23.....	6		
Teneriffe:				
Santa Cruz.....	Dec. 3-Apr. 6.....		53	
Turkey in Asia:				
Beirut.....	Dec. 3-Mar. 30.....	1,475	107	
Turkey in Europe:				
Constantinople.....	Dec. 4-Apr. 7.....		141	
Uruguay:				
Montevideo.....	Sept. 1-Dec. 31.....	25	4	
Venezuela:				
Caracas.....	Nov. 1-Jan. 15.....	11	2	
Zanzibar:				
Zanzibar.....	Oct. 28-Dec. 15.....	3	2	

MORTALITY.

WEEKLY MORTALITY TABLE, FOREIGN AND INSULAR CITIES.

Cities.	Week ended—	Estimated population.	Total deaths from all causes.	Deaths from—									
				Tuberculosis.	Plague.	Cholera.	Yellow fever.	Smallpox.	Typhus fever.	Typhoid fever.	Scarlet fever.	Diphtheria.	Measles.
Aberdeen.....	Apr. 6	163,084	49									1	
Aguscalientes.....	Apr. 21	40,000	63	3					3			1	4
Amsterdam.....	Apr. 13	582,586	103	21								2	
Antwerp.....	Apr. 6	316,604	66	5								3	
Barcelona.....	do.....	591,271	240	34								1	
Do.....	Apr. 13			36					5			3	
Basel.....	Apr. 6	138,000	27	5								1	
Belfast.....	Mar. 16	385,492	147	27								1	4
Do.....	Apr. 6		145	13				1				1	
Do.....	Apr. 13		147	16									9
Belgrade.....	do.....	90,050	47							4		1	
Berlin.....	Mar. 23	2,085,857	576	82					1	7	12	5	8
Do.....	Mar. 30	2,086,127	575	85					1	4	11	11	8
Do.....	Apr. 6		521	68					1	2	11	5	4

MORTALITY—Continued.

Weekly mortality table, foreign and insular cities—Continued.

Cities.	Week ended—	Estimated population.	Total deaths from all causes.	Deaths from—										
				Tuberculosis.	Plague.	Cholera.	Yellow fever.	Smallpox.	Typhus fever.	Typhoid fever.	Scarlet fever.	Diphtheria.	Measles.	Whooping cough.
Birmingham	Apr. 13	842,512	203							1	1	1	1	14
Bordeaux	do.	253,000	94	13									6	
Do.	Apr. 20		103	11						2		3	7	
Bradford	Apr. 13	289,618	95	9						1		2	1	
Bremen	Mar. 30	246,850	75	19							2	1	1	2
Brunswick	Apr. 6	145,000	3	3									1	
Brussels	do.	649,846	164	14								8	6	
Do.	Apr. 13	739,684	176	24							13	8	2	1
Budapest	Mar. 30	1,000,000								2	2	2	5	1
Cairo	Mar. 25	689,439	371	19				1	1	2			2	
Calcutta	Mar. 16	890,493	553	31	106	79						2	2	
Catania	Apr. 12	207,000	85	4							2	2	1	
Do.	Apr. 19										1	1		1
Chemnitz	Apr. 6	299,000	81	6				1						
Christiania	do.	246,000	118	14								2		1
Do.	Apr. 13		101	12										
Cologne	Apr. 6	527,663	128	25						2				
Copenhagen	Mar. 30	465,000	145	21								1	2	1
Dalny	do.	45,539	27	1										
Dresden	do.	556,200	139	30						2		3		1
Dublin	Apr. 30	406,536	216	35								14		2
Dundee	Apr. 13	171,006	55	3								2	1	1
Edinburgh	Apr. 6	321,200	113	7								4	1	
Do.	Apr. 13		99	9								10		
Fiume	do.	51,500	25	10										1
Frankfort on the Main	Mar. 30	423,000	96	5								1		4
Glasgow	Apr. 19	782,110	254					1	1	1		3	15	
Gothenburg	Apr. 6	170,100	33	8										1
Guadalajara	Apr. 13	119,468	97					2						
Do.	Apr. 20		98	1					3					
Halifax	Apr. 19	46,000	23							1		1		
Hamburg	Apr. 6	953,079	266	35						1		4	2	6
Kingston	Apr. 13	59,584		1						2				
Kobe	Mar. 31	418,646	118						1			1		
Konigsburg	Mar. 30	252,200	92	9						1				2
Do.	Apr. 6		102	20								1	2	
Kurrachee	Mar. 30	159,270	147		68								16	
La Guaira	Mar. 31	10,000	29	3			2							
Leeds	Apr. 13	445,568	121							1	1	2	1	
Leipzig	Mar. 30	605,755	135	23										3
Do.	Apr. 6		138	25								1		2
Leith	Apr. 13	81,000	21	1								1	3	1
Liege	Apr. 6	167,643	56	6									4	1
Liverpool	Apr. 13	752,055	249	22				1		2	2	4	9	7
London	do.	7,340,125	1,726							2	3	16	30	57
Lubeck	do.	100,000	28	3						1		1		
Madras	Mar. 30	518,660	352			6		6		1			4	
Manaos	do.	52,000	47	4					3					
Do.	Apr. 6		48	5					2					
Manchester	Apr. 13	714,427	219	20							1	1	14	15
Mannheim	Mar. 23	200,200	49	3							1		1	
Do.	Mar. 30	201,201	39	5										1
Mazatlan	Apr. 16	22,000	17					2						
Monterey	Apr. 21	100,000	55	7					1	2	1	1		
Montreal	Apr. 20	466,197	205	26					3	2	1			
Do.	Apr. 27		190	24					4	2	1			3
Moscow	Mar. 23	1,500,000	766	115				3	3	18	11	15		9
Munich	Mar. 30	610,000	175	19								3		
Nantes	Apr. 7	170,525	71	18						2		1		
Newcastle-on-Tyne	Apr. 13	269,193	79	9							1			
Nottingham	Apr. 6	260,000	88	9								1	9	3
Nuremberg	Mar. 9	334,797	105	16							2	2		2
Do.	Mar. 16		91	11										
Odessa	Mar. 30	575,000	179	32					2	1		2	1	1
Palermo	Apr. 6	340,000	142	6				5			1			
Para	do.	185,000	84	8	2									
Palermo	Apr. 13	340,000	159	14				5						1
Paris	Apr. 6	2,888,110	1,027	249					5	5	7	31		8
Patras	Apr. 7	40,000	11	3					1					
Port of Spain	Mar. 30	60,000	28	7					1					

MORTALITY—Continued.

Weekly mortality table, foreign and insular cities—Continued.

Cities.	Week ended—	Estimated population.	Total deaths from all causes.	Deaths from—										
				Tuberculosis.	Plague.	Cholera.	Yellow fever.	Smallpox.	Typhus fever.	Typhoid fever.	Scarlet fever.	Diphtheria.	Measles.	Whooping cough.
Port of Spain	Apr. 6		26	6						1			1	
Port Said	Mar. 25	52,811	22	2								1		
Prague	Mar. 30	225,204	90	17						1		2	2	1
Do	Apr. 6		86	12								2	4	
Rangoon	Mar. 23	293,316	177	3	14	3		12						
Rio de Janeiro	Mar. 2	921,987	381	66						4		1	2	5
Do	Mar. 9		349	66									5	5
Do	Mar. 16		353	59						1			3	5
Rotterdam	Apr. 13	438,774	99									1		
Saigon	Mar. 18	220,000				16								
St. John, N. B.	Apr. 20	40,711	27								1	1		
St. Petersburg	Mar. 30	907,708	512	141				8		11	16	8	16	8
San Luis Potosi	Feb. 17	82,476	35	3						4				
Do	Feb. 24		57	3				1		2				1
Santa Cruz de Tenerife	Apr. 6	46,000	12	2										
Santiago de Cuba	do.	53,614	23	2						1				
Do	Apr. 13		23							1				
Santos	Jan. 28	85,000	81	7									1	1
Do	Feb. 24		77	2						1				1
Do	Mar. 2		36	10						1				
Shanghai	Mar. 24	500,000	194	21										
Singapore	Mar. 9	303,328	172	27				2		2	6	4	35	
Do	Mar. 16		175	30	1									
Southampton	Apr. 13	120,891	33	1						1				3
Stettin	Apr. 6	240,000	64	4								1	2	
Stockholm	Mar. 30	343,832	106	21								2	2	2
Do	Apr. 6		114	18								2	4	2
Stoke-on-Trent	Apr. 13	217,153	53	3							1			
Swansea	Mar. 30	117,150	35	5								1	1	4
Do	Apr. 6		33	1						1		1	1	
Do	Apr. 13		29	2									1	
Trieste	Mar. 30	232,822	103									1		
Do	Apr. 6	235,999	105										2	2
Tripoli-in-Barbary	Apr. 7	50,000	72	4				1		8				
Turin	Apr. 14	430,770	141	13						2		2	1	2
Valencia	Apr. 6	235,000	90	3				1						
Do	Apr. 12		92	4										
Vancouver	do.	110,000	19									1	1	
Do	Apr. 20		21	2										
Vienna	Mar. 30	2,064,583	712	125					1	4	7	8	4	
Warsaw	Feb. 24	797,093	250	28				2		7		2	2	1
Winnipeg	Apr. 20	151,958	63	3								1	1	
Yokohama	Apr. 8	444,039										1		

MORTALITY—FOREIGN AND INSULAR COUNTRIES AND CITIES
(Untabulated).

ALGERIA—*Algiers*.—Month of March, 1912. Population, 172,397. Total number of deaths from all causes 361, including diphtheria 3, tuberculosis 72, typhoid fever 3.

FRANCE—*Marseille*.—Month of March, 1912. Population, 550,619. Total number of deaths from all causes 879, including diphtheria 3, smallpox 1, tuberculosis 164, typhoid fever 8.

Roubaix.—Month of March, 1912. Population, 122,723. Total number of deaths from all causes 175, including diphtheria 2, scarlet fever 1, tuberculosis 27.

GREAT BRITAIN.—Week ended April 6, 1912.

England and Wales.—The deaths registered in 95 great towns correspond to an annual rate of 14 per 1,000 of the population, which is estimated at 17,639,830.

Ireland.—The deaths registered in 21 principal town districts correspond to an annual rate of 20.9 per 1,000 of the population, which is estimated at 1,157,014. The lowest rate was recorded at Queenstown, viz, 6.6, and the highest at Wexford, viz, 36.4 per 1,000.

INDIA—*Rangoon.*—Month of February, 1912. Population, 293,316. Total number of deaths from all causes 878, including cholera 16, smallpox 28, tuberculosis 31, typhoid fever 3.

ITALY—*Florence.*—Month of March, 1912. Population, 239,295. Total number of deaths from all causes 335, including diphtheria 3, measles 24, tuberculosis 43, typhoid fever 1.

JAPAN—*Formosa.*—Two weeks ended March 9, 1912. Population, 3,341,217. Total number of deaths from all causes not reported. The deaths include diphtheria 4, typhoid fever 6.

PORTUGUESE EAST AFRICA—*Lourenço Marquez.*—Month of December, 1911. Population, 10,000. Total number of deaths from all causes 48, including tuberculosis 12, typhoid fever 2.

SOUTH AFRICA—*Johannesburg.*—Two weeks ended March 23, 1912. Population, 237,220. Total number of deaths from all causes 171, including diphtheria 2, tuberculosis 26, typhoid fever 10.

SPAIN—*Cadiz.*—Month of March, 1912. Population, 67,306. Total number of deaths from all causes 203, including smallpox 2, tuberculosis 27, typhoid fever 1.

Seville.—Month of March, 1912. Population, 158,235. Total number of deaths from all causes 377, including diphtheria 2, measles 1, smallpox 2, tuberculosis 70, typhoid fever 1.

By authority of the Secretary of the Treasury:

RUPERT BLUE,

Surgeon General,

United States Public Health and Marine-Hospital Service.

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