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COMMISSION ON MILK STANDARDS.

THIRD REPORT OF THE COMMISSION ON MILK STANDARDS APPOINTED BY THE NEW YORK MILK COMMITTEE.[1]

PREAMBLE.

Purposes of Milk Standards.

Proper milk standards are essential to efficient milk control by public health authorities. In the first place health authorities must ascertain that the chemical composition corresponds with established definitions of milk as food, but their more important duty is to prevent the transmission of disease. This means the prevention of the transmission by milk of infant diarrhea, typhoid fever, tuberculosis, septic throat infections, scarlet fever, diphtheria, and other infectious diseases. In the interests of milk consumers public health authorities must take positive action to prevent the transmission of any of these diseases, in addition to their duty of preserving the food value of milk.

The milk producer is interested in proper standards for milk, and should support a movement to secure proper standards, for the reason that these contribute to the well-being and dignity of the milk industry itself. Proper standards, rightly enforced, distinguish between the good-milk producer and the bad-milk producer. This inevitably will lead to the improvement of dairy farming, and eventually to an increase in the financial prosperity of the milk producer himself through better prices for better milk. It will enable the producer to get properly paid for the quality of milk he produces, and thus put that industry for the first time upon a dependable basis.

The milk dealer finds the classification of milk resulting from milk standards to his financial advantage for the reason that it identifies clearly first-class milk and distinguishes it from second-class milk. Such a distinction gives to the seller of first-class milk the commercial

[1] Previous reports were published in the Public Health Reports, May 10, 1912, pp. 673-700; and Aug. 22, 1913, pp. 1733-1756.

rewards which such milk deserves, and the official label creates a market for first-class milk which the dealer alone is unable to create.

For milk consumers the setting of definite standards accompanied by labeling with official control of the labels makes it possible to know the character of the milk which is purchased, and to distinguish good milk from bad milk. The establishment of standards for quality, and of labels on retail packages indicating the quality, compels the industry not only to purchase milk on a quality basis, but also to sell milk on a quality basis. The selling of milk strictly on a quality basis, which includes not only chemical composition but sanitary character, makes it possible for consumers by an inspection of the label intelligently to select milk which in quality and price is most suitable for their needs.

Administrative Equipment.

Standards are useless unless properly guarded and enforced. The chief objection that has been raised to a grading system for milk is the difficulty of insuring that milk labeled as of a certain grade is actually of that grade when sold to the consumer.

The prime requisite for efficient milk control is that health departments shall be adequately equipped with men, money, and laboratory facilities. The commission is of the opinion that satisfactory results can not be expected from laws when there is not sufficient appropriation, and when there is no machinery for their enforcement. A survey of the money appropriated for milk control shows that in the majority of municipalities this is entirely insufficient for public needs.

The key to the solution of the problem of the proper use of grade labels is the laboratory. The establishment and operation of an efficient milk testing laboratory is commonly supposed to be an item of great expense. This, however, the commission is convinced, is a mistake, since there are numerous laboratories scattered all over the land not only private, but public, which are inexpensive and operated at low cost. By efficiency methods a large number of tests can be made at a very low cost. Even small communities can afford to maintain and operate such laboratories. Where for any reason it is not possible to do this, it has proven to be practicable for one community to enter into laboratory arrangements with another, and even several can combine in the use of a common laboratory.

Grading of Milk.

There is no escape from the conclusion that milk on the market must be graded just as other commodities such as wheat, grain, beef, etc., are graded. The milk merchant must judge not only of the food value but also of the sanitary characteristics of the commodity in which he deals. There is no good reason for believing that fruit

beginning to decay is particularly unhealthful, but it should not be sold on a par with sound fruit. Small apples have as much food value as an equal quantity of large ones, but the latter properly command a higher price. So, too, with milk; the high-grade product, fresh and cold, will cost more to buy from the producer, and should sell for more to the consumer than does the low-grade product. The commission's most important work has been the attempt to separate milk into grades and classes. The commission has endeavored to make its grading system as simple as possible, and at the same time to distinguish between milks which are essentially different in their sanitary and other character. The commission is convinced that the experience of the last three years has fully demonstrated the value of the grading system in the communities in which it has already been applied, both from a public health and an economic standpoint. The commission believes that the grading of milk offers a satisfactory solution for most of the sanitary and economic problems which have hitherto prevented efficient milk control, and that it is feasible for small communities as well as large communities to adopt a grading system and to secure its benefits.

CHIEF SUBJECTS CONSIDERED.

The commission during its deliberations over a period of five years and on the occasions of its eight meetings and the numerous meetings of its subcommittees has given attention to a great variety of subjects. The more important conclusions it has reached are the following:

(1) Chemical Standards for Milk.

The lack of uniformity in chemical standards used by different municipalities and States throughout the United States and Canada has led the commission to believe that it is desirable for them to give expression to their opinion concerning proper chemical standards for milk. The commission recognizes that chemical standards do not involve public health questions excepting in so far as they safeguard the food value of milk. Nevertheless, as milk is a food, chemical standards are necessary for defining its nutritive value.

The chemical standards suggested are the work of a special committee, composed of chemists, which has carefully considered the natural composition of milk, as well as 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 word "standard" used in connection with milk is not intended to imply excellence, but simply to express the lowest possible standard

or limit that the law permits for a pure or normal milk. The same meaning applies to the word used in connection with milk products.)

The Babcock test makes easily practicable the determination of fat and solids-not-fat in milk. Such 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 help to raise the standards of dairying in this country, and that the provision regarding substandard milk is a liberal one.

Cow's milk.—Standard milk should contain not less than 8.5 per cent of 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 should contain not less than 18 per cent of milk fat, and should be 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.

Adjusted milks.—On the question of milks and creams in which the ratio of the fat 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 such processes as standardizing, skimming, homogenizing, souring, adjusting, etc., so as to prevent contamination and the use of inferior materials. On this subject the commission passed a resolution presented by a special committee, as follows:

> The committee believes that it is probably necessary to admit standardized and adjusted milk. They believe that such manipulation should be controlled and that such milk should be distinctly labeled as to its modifications.
>
> Milk in which the ratio of the fat 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.

The committee very carefully considered the subject of the agitation which has taken place regarding percentage of solids-not-fat due to the fact that in some large cities much of the milk contains less than 8.5 per cent solids-not-fat. While the commission is disposed to admit that these conditions may exist, yet it believes that these conditions can be remedied, if not immediately at least gradually. On the other hand, experience has shown that to lower the standard would in a few years result in the lowering of the general quality of the milk placed on the market, since commerce always tends to approach the minimum standard. The commission there-

fore thinks it is unwise to reduce the standard for solids-not-fat below the percentage of 8.5. In those communities where such a standard can not be rigidly enforced at the present time the commission suggests that the standard be gradually applied.

Regulation of market milk on basis of guaranteed percentage composition.—(*a*) Sellers of milk should be permitted choice of one of two systems in handling market milk. They may sell milk, first, under the regular standard; or, second, under a guaranteed statement of composition.

(*b*) Any normal milk may be sold if its percentage of fat is stated. In case the percentage of fat is not stated the sale should be regarded as illegal unless the milk contains at least 3.25 per cent of milk fat.

(*c*) 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.

(*d*) 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.

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

(2) Bacteria and Bacterial Testing.

Bacteria and bacterial testing have undoubtedly occupied more of the commission's time than any other subject, this topic being considered at each of its meetings, Every phase of the relationship of bacteria to the sanitary character of milk, as well as to the infectious diseases transmissible by milk, has been discussed by the seven bacteriologists who are members of the commission. The significance of bacteria in milk and methods of bacterial testing have been considered in detail, not only from the personal standpoint of the bacteriologist, but from the administrative standpoint of the eight health officers who are members of the commission, as well as the two agricultural experts. Because of frequent conferences with members of the dairy industry, as well as a knowledge of the action taken by municipalities on this subject, it is believed that all phases of the relationship of bacteria to milk have been impartially considered and that the conclusions reached fairly represent the place which bacterial testing should occupy.

The commission recognizes that the number of bacteria in milk is controlled in the majority of instances by three factors: Dirt, temperature, or age. Only in the minority of instances are the bacteria of specific diseases present. The routine laboratory methods for examining milk have therefore as their chief purpose the control over dirt, temperature, and age. The difficulties of detecting the specific bacteria of disease by laboratory methods prevent laboratories from

undertaking such detection as a routine. For this reason laboratory methods are as yet of little value in safeguarding milk against specific diseases. The only practical way for protecting milk from infection by the bacteria of infectious diseases is by medical, veterinary, and sanitary inspection, and by pasteurization. Nevertheless the commission believes that large numbers of bacteria that are not specific disease germs have a health significance.

The routine laboratory methods for determining the total numbers of bacteria in milk are believed to furnish a general indication of the safety of milk. Small numbers indicate fresh milk produced under cleanly conditions, and kept cool, and such milk is safer than milk containing large numbers of bacteria which is either dirty, warm, or stale. In addition to this, the relation which large numbers of bacteria bear to the sanitary character of milk is shown by certain facts, among which the following are worthy of mention:

Relation of large numbers of bacteria to infant mortality.—The commission believes that the numbers of bacteria in milk have a relation to the infant mortality, for the following reasons:

(*a*) Evidence furnished by clinical observations of groups of children fed on milk containing small numbers of bacteria and large numbers of bacteria shows a higher death rate in the latter than in the former.

(*b*) In general, a reduction in infant mortality in cities results from a substitution of milk containing small numbers of bacteria for milk containing large numbers of bacteria.

(*c*) Bacteria causing no specific intestinal infections in adults may cause infant diarrhea, and milk containing large numbers of bacteria more often contains species capable of setting up intestinal inflammation in infants than milk containing small numbers of bacteria.

Bacterial counts and decency.—On this subject the commission passed the following resolutions:

(*a*) Because high bacterial counts indicate milk is either warm, dirty, or stale, the bacterial count is an indicator of decency in milk character, entirely apart from its significance as an indicator of the safety of milk.

(*b*) In determining the sanitary character of milk and the grade in which it belongs, decency must be considered as desirable for its own sake, entirely apart from the consideration of safety. Decency is important as a characteristic of foods and drinks, because it gives pleasure to the consumption of food, while the lack of decency means distaste, displeasure, and even disgust.

(*c*) The bacterial count is a sufficiently accurate measure of decency to justify the health officer in condemning milk with a high bacterial count because it is lacking in this characteristic.

Bacteriological laboratory testing of milk.—On the subject of laboratory examinations of milk for bacteria the commission believes that the interests of public health demand that the control of milk supplies, both as to production and distribution, should include regular laboratory examinations of milk by bacteriological methods. They stated by resolution that—

Among present available routine laboratory methods for determining the sanitary quality of milk the bacterial count occupies first place, and that bacterial standards should be a factor in classifying milk of different degrees of excellence.

The adoption and enforcement of 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 be carried out only by the regular and frequent laboratory examinations of milk for the numbers of bacteria it may contain.

It is of the utmost importance that standard methods should be adopted by all laboratories for comparing the bacterial character of milks, since by this means only is it possible to grade and classify milks and properly enforce bacterial standards.

Concerning the methods which should be used by milk laboratories for determining the numbers of bacteria the commission unanimously resolved:

That there be adopted as standards for making the bacterial count the standard methods of the American Public Health Association Laboratory Section.

One of the chief objections raised against pasteurization is the claim that it is frequently employed to cover filthy methods, the milk producer using less care in his methods if he knows that the milk is to be subsequently pasteurized. To meet this objection the commission believes there should be bacterial standards for raw milk as well as bacterial standards for pasteurized milk. In the case of pasteurized milk, standards should be required of the milk before pasteurization as well as after pasteurization.

Reliability of bacterial tests.—The commission has considered the numerous criticisms that have been raised as to the unreliability of bacteriological analyses, and has made extensive inquiry as to the force of these criticisms. An opinion concerning the reliability of laboratory tests for numbers of bacteria has been reached based on voluminous statistics secured for the most part by groups of observers working together, as well as by individuals. One of these researches alone carried out by members of the commission in cooperation with others included the testing of over 20,000 samples of milk. In other instances repeatedly the same sample of milk was tested 100 times. Some variations in the analysis of duplicate samples are inevitable, due to the fact that the bacteria are not in solution, but are floating in the milk more or less clustered together in clumps, each of which will count only as a single colony. Under such conditions only an approximate agreement can be expected.

The results of extensive study justify the commission in the conclusion that the analysis of duplicate samples of milk made by routine

methods in different laboratories may be expected to show an average variation of about 28 per cent, with occasional samples of wider variation. In some good laboratories the variation may not be greater than 10 per cent. Variations in results diminish with the numbers of samples analyzed. If five samples of the same milk are tested, the results may be relied upon as fairly accurate, and always sufficiently accurate to place any particular milk supply unhesitatingly in grade A, B, or C. The object of bacterial tests of milk samples for the numbers of bacteria should be primarily to determine the sanitary character of the milk supply from which the sample is taken, rather than the character of a single sample of milk. It is strongly urged by this commission that no grading of milk should be made upon the analysis of single samples, and that no prosecutions or court cases should be brought upon the bacterial analysis of a single sample of milk.

Interpretation of bacterial tests.—The commission has put its opinions on this subject in the form of resolutions, as follows:

Whereas milk is one of the most perishable foods, being extremely susceptible to contamination and decomposition; and

Whereas the milk consumer is justified in demanding that milk should be clean, fresh, and cold, in addition to having the element of safety; and

Whereas milk which is from healthy cows and is clean, fresh, and which has been kept cold, will always have a low bacterial count; and

Whereas milk that is dirty, stale, or has been left warm, will have a high bacterial count; therefore it is resolved:

First. That the health officer is justified in using the bacterial count as an indicator of the degree of care exercised by the producer and dealer in securing milk from healthy cows and in keeping the same clean, fresh, and cold; and

Second. That the health officer is justified in condemning milk with a high bacterial count as being either unhealthy or decomposed, or containing dirt, filth, or the decomposed material as a result of the multiplication of bacteria due to age and temperature.

Third. That the health officer is justified in ruling that large numbers of bacteria are a source of possible danger, and that milk containing large numbers of bacteria is to be classed as unwholesome, unless it can be shown that the bacteria present are of a harmless type, as for example, the lactic acid bacteria in buttermilk or other especially soured milks.

Grading by the bacterial count.—Concerning the number of tests which should be made in order to determine the grade of a milk supply, the commission recommends that the grade into which a milk falls shall be determined bacteriologically by at least five consecutive bacterial counts, taken over a period of not less than one week, nor more than one month, and that at least four out of five of these counts (80 per cent) must fall below the limit or standard set for the grade for which classification is desired.

The grading of milk has necessarily been based on its sanitary character, primarily as determined by the bacterial test. The enforcement of grading, therefore, requires the application of the bacterial test in a manner sufficiently comprehensive to fairly determine

the sanitary character of milk so that it may be assigned to the grade in which it belongs. Such an administrative system greatly modifies the former conception of milk inspection by public health officials. The inspection service under the grading system becomes subordinate to the bacterial laboratory, or at least must look to the bacterial laboratory as a guide. If bacterial tests are recognized as an indication of the sanitary character of milk, then the bacterial laboratory tests should precede the dairy inspection since they will point out to the dairy inspector the location of unsanitary milk. In the enforcement of the grading system, therefore, the milk inspection service should be reorganized in such a manner that the bacterial laboratory makes its tests first, in order to determine the sanitary character of the various milks offered for sale on the city market, and the inspection service then takes up the task of discovering the location and causes of the defects which the laboratory has discovered and of remedying them. The laboratory service and inspection service consequently must be centralized under one head and their work thoroughly coordinated in order to give the greatest economy and efficiency.

Bacterial standards for cities of different sizes.—In establishing the bacterial standards for a city it is important to take into consideration the necessary age of the milk, the distance it is hauled, and the methods employed in its hauling, in addition to the sanitary condition of the milk at its source. It will always be possible for a community having very few dairies, easily controlled, which consumes milk produced within its own limits, or within transportation of 12 hours or less from the sources of supply, to insist upon and maintain a better bacterial standard than can a city where the milk is hauled many miles into town to be consumed within 24 hours after it is produced from numerous dairies difficult to control. The small city for these reasons can and should always maintain a better bacterial standard than the large city.

Microscopic examination.—Under certain conditions the examination of milk for bacteria by the microscopic method serves a useful purpose. In its favor it has the advantage of quick and immediate results, which in the hands of reliable workers have proven to agree remarkably well with the results obtained by the plate method. At times it gives useful information as to the types of bacteria present. On the other hand, the microscopic method fails to distinguish between dead and living bacteria, and therefore its value in the examination of pasteurized milk is uncertain. Its chief value has been in securing quick information regarding the character of raw milk, and for this reason it is most useful at the producing and shipping end of the line rather than at the city end.

(3) Pasteurization.

The pasteurization of milk has been discussed at every meeting held by the commission. Its effect on bacteria, its effect on milk, its effect on public health, the questions of time and temperature and efficient control have all been repeatedly and carefully considered in detail. It is believed that the commission has not neglected to take into account any of the important contributions which have been made to modern knowledge on this subject. In connection with pasteurization the commission has also carefully considered the subject of the degrees of safety furnished to milk by the tuberculin testing of cattle and medical inspection of dairy employees.

After a thorough consideration of the various times and temperatures used, and different forms of apparatus recommended by various authorities, the commission decided upon the following definition of pasteurization:

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 30 minutes.

Regarding the methods of pasteurization, the commission believes that pasteurization in bulk when properly carried out has proven satisfactory, but that pasteurization in the final container is preferable.

The commission thinks that pasteurization is necessary for all milk, excepting grade A raw milk. The majority of the commissioners voted in favor of the pasteurization of all milk, including grade A raw, but since the action was not unanimous the commission recommended that the pasteurization of grade A raw milk be optional.

The process of pasteurization should be under efficient supervision. The supervision should consist of a personal inspection by the milk inspector. The intervals between inspections should be not more than one month. The inspector should score the pasteurizing plant by a score card.

Specimens of milk for bacterial analysis should be taken at the different stages in pasteurization and subsequent handling.

All plants handling 1,000 quarts of milk or more a day should be required to be equipped with automatic temperature regulators, flow regulators, and recording thermometers. The records of these must be examined by the Department of Health not less often than once a month.

Where pasteurization is done with small apparatus not so equipped, the proprietor should be required to examine the temperature of the milk in the heater at the first and last of each run, and keep a record of such temperatures, which record shall be submitted to the department of health not less often than once a month.

For the use of small dealers in cities, and small producers for towns and villages, efficient pasteurizers costing less than $200 are available. The commission, therefore, thinks that milk ordinances for towns and villages, as well as for large cities, and also State milk laws, should provide compulsory pasteurization, except for grade A raw milk.

The efficiency of pasteurization should be controlled by bacterial tests before and after heating.

Scurvy and pasteurization.—The commission has assumed that the low temperature of 145° F. for 30 minutes as recommended by this commission for pasteurization destroys none of the food constituents of milk. Inquiry conducted by the New York City Department of Health into the records of the infant-milk depots, where sometimes over 25,000 infants are fed daily on pasteurized milk, appears to bear out this assumption. In view of the fact, however, that recent hospital experimental studies suggest that an exclusive diet of pasteurized milk may give rise to a subacute scurvy or similar nutritional disease in infants, which was entirely prevented, and even cured, by the feeding of orange juice or other antiscorbutic food, the commission recommends that orange juice be added to the diet of infants that are fed on pasteurized milk. The commission wishes also to reaffirm its advocacy of the adoption of pasteurization by municipalities as a public-health measure.

The tuberculin testing of dairy cows.—The commission has noted recent developments in connection with the manner of administering tuberculin as a diagnostic agent and goes on record as approving the use of tuberculin by the usual subcutaneous method, always, however, in connection with physical diagnosis, and with due regard to the methods prescribed by the United States Bureau of Animal Industry. Other methods of using tuberculin should be regarded still as under judgment.

The commission believes that health officers should encourage the use of tuberculin as an ideal diagnostic agent when in proper hands, and extend its use as rapidly as possible, realizing its practical limitations owing to the enormous number of cattle and their migrations and the limited number of veterinarians qualified to use this test.

It should be remembered also that tuberculin testing is a means of meeting only one of the many problems of milk control.

(4) Grades of Milk.

The commission believes that all milk should be classified by dividing it into three grades, which shall be designated by the letters of the alphabet. It is the sense of the commission that the essential part is the lettering and that all other words on the label are explanatory. In addition to the letters of the alphabet used on caps or labels, the use of other terms may be permitted so long as such terms are not the cause of deception. Caps and labels shall state whether milk is raw or pasteurized. The letter designating the grade to which the milk belongs shall be conspicuously displayed on the caps of bottles or the labels of cans.

The requirements for the three grades shall be as follows:

GRADE A.

Raw milk.—Milk of this class shall come from cows free from disease as determined by tuberculin tests and physical examinations by a qualified veterinarian, and shall be produced and handled by employees free from disease as determined by medical inspection of a qualified physician, under sanitary conditions, such that the bacterial count shall not exceed 10,000 per cubic centimeter at the time of delivery to the consumer. It is recommended that dairies from which this supply is obtained shall score at least 80 on the United States Bureau of Animal Industry score card.

Pasteurized milk.—Milk of this class shall come from cows free from disease as determined by physical examinations by a qualified veterinarian, and shall be produced and handled under sanitary conditions, such that the bacteria count at no time exceeds 200,000 per cubic centimeter. All milk of this class shall be pasteurized under official supervision, and the bacteria count shall not exceed 10,000 per cubic centimeter at the time of delivery to the consumer. It is recommended that dairies from which this supply is obtained shall score at least 65 on the United States Bureau of Animal industry score card.

GRADE B.

Milk of this class shall come from cows free from disease as determined by physical examinations, of which one each year shall be by a qualified veterinarian, and shall be produced and handled under sanitary conditions, such that the bacteria count at no time exceeds 1,000,000 per cubic centimeter. All milk of this class shall be pasteurized under official supervision, and the bacterial count shall not exceed 50,000 per cubic centimeter when delivered to the consumer.

It is recommended that dairies producing grade B milk should be scored, and that the health departments or the controlling departments, whatever they may be, strive to bring these sources up as rapidly as possible.

GRADE C.

Milk of this class shall come from cows free from disease, as determined by physical examinations, and shall include all milk that is produced under conditions such that the bacteria count is in excess of 1,000,000 per cubic centimeter.

All milk of this class shall be pasteurized, or heated to a higher temperature, and shall contain less than 50,000 bacteria per cubic centimeter when delivered to the consumer.

Whenever any large city or community finds it necessary, on account of the length of haul or other peculiar conditions, to allow the sale of grade C milk, its sale shall be surrounded by safeguards such as to insure the restriction of its use to cooking and manufacturing purposes.

Grades for small cities and towns.—This commission recognizes that because of climate, size of the community, nearness to the sources of supply, ease of transportation, and progress already made in improving the general milk supply, and in educating the dairymen and the public, different communities are in position to secure varying degrees of excellence in their standards for the grades of milk. This commission, therefore, urges that its standards for grades A, B, and C milk be regarded as minimum standards, and that any community may adopt higher requirements for its grades if its conditions make this feasible and desirable.

As a guide to health officers in the establishment of grades best adapted for their local communities, the following general broad principles are offered:

(1) A careful preliminary survey of the milk situation should be made before the requirements of the several grades are adopted.

(2) No matter how excellent the general milk supply of a community, it is not all of a single standard of excellence, hence there are actually different grades of milk in every community, and the recognition of such grades is always advantageous.

(3) Grades in any community should always be such as to separate into two, or at most three, classes the milk supply of that special community. Where little or nothing has been done toward improving the general milk supply, it may be desirable to adopt temporary grades (but not below the minimum requirements suggested by this commission), with a time limit as to when more rigid requirements for the grades will be enforced.

(4) Grades as adopted in any community should be such as not, under any circumstances, to sanction the sale of milk below the minimum standards which it is feasible for that community to require.

(5) Whatever departures are made by any community from the exact definition of grades as recommended by this commission, several fundamental principles are recognized by the commission as of universal application, and from these there should be no variation. These fundamental principles are:

(*a*) Grade A milk, in a general way, is milk which complies with requirements of such character and degree that, for all practical purposes, no real advantage would be gained by further and higher requirements. The standards for this grade should therefore be placed high enough to attain this end, but not so high as to limit too greatly the supply, or, through unduly raising the price to the consumer, to limit too greatly the demand.

(*b*) Grade B milk is all the remaining milk of the community which is suitable for drinking purposes, after pasteurization, but which does not comply with the high requirements for grade A milk.

(*c*) Grade C milk is milk which falls below the minimum requirements for milk suitable for drinking purposes, even after pasteurization. Its use must be confined to cooking and manufacturing purposes. Recognition of this grade of milk is not recommended by this commission except in communities in which such recognition is an economic necessity.

(6) The fundamental objects in grading milk are:

(*a*) To aid in making safe for human consumption all milk which can legally be sold for drinking purposes;

(*b*) To distinguish between classes of milk which, while all are safe, are of different degrees of excellence in respect to cleanliness and care in handling.

Each community should, therefore, endeavor to grade its milk supply so as best to attain these objects without departure from the broad general principles above laid down.

(5) Cream.

Cream should be classified in the same grades as milk in accordance with the requirements for the grades of milk, excepting the bacterial standards, which in 18 per cent cream shall not exceed five times the bacterial standard allowed in the same grade of milk.

Cream containing other percentages of fat shall be allowed a modification of this required bacterial standard in proportion to the change in fat.

(6) Butter.

There is evidence that much of the butter offered for sale on city markets is produced from cream of an inferior grade. The source of such cream is in many instances farms where dairying is only incidental and there are no facilities for sanitary care or refrigeration. The stations where this cream is gathered, and the plants where it is manufactured into butter are often in a most unsanitary condition. It is believed that sanitation in the production and handling of fluid milk is far in advance of sanitation in the butter industry. It is the opinion of the commission that steps should be taken at once to bring about a reform in the production and handling of butter, and that this can best be done by the establishment of standards and grades which will distinguish between the superior and inferior product. The commission has deliberated on the subject of butter for a period of three years, and has made a detailed study through several of its standing committees, in addition to conferences with leading representatives of the industry itself. The conclusion of the commission on this subject is as follows:

Definition.—Standard butter is the clean, nonrancid product made by gathering, in any manner, the fat of fresh or ripened cream or milk into a mass, which also contains a small portion of other milk constituents, with or without salt, or added harmless coloring matter, and contains not less than 82 per cent of milk fat.

Butter should be graded as to its sanitary quality and market score, and this commission recommends such methods as were recently adopted by law in Minnesota and Iowa, whereby the grading of butter on such a basis will be started as a voluntary matter.

In the interest of public health, cream used in the manufacture of butter should be pasteurized before being used.

Grade A butter should be made from grade A milk or cream.

Grade B butter should be made from grade B milk or cream.

The sale of butter should be restricted to the product obtained from milk or cream that has been produced in such a manner that it could be sold when fresh as grade A or grade B milk or cream, as defined by this commission. Such milk or cream shall be handled before manufacture under strictly sanitary conditions by persons free from communicable disease.

If the sale of butter that is made from an inferior grade of milk or cream is permitted, such milk or cream should in all cases be pasteurized, and the butter properly labeled.

If butter is manufactured from rectified milk or cream, the fact shall be so stated on the label, and such butter should be considered as of the same class as renovated butter. Such butter shall be classified as grade C.

All containers in which butter is sold shall be marked with the grade of the poorest milk or cream that is used, with the name and location of the plant at which it is manufactured, and with the date of manufacture.

(7) Ice Cream.

The commission has had the subject of ice cream under consideration for three years. It has been in the hands of a special committee.

In 1914 several series of bacteriological examinations of ice cream were carried out by the bacteriologists of the commission, all of whom handed in reports to the commission showing the character of ice cream from samples taken in their own localities. There was also made available for the commission special work done on this subject by the Department of Agriculture at Washington, and by a number of public health authorities.

The commission voted that ice cream shall be regarded as a food rather than a confection in the sense of the pure-food law. The commission also voted that the milk and cream used in the manufacture of ice cream should conform to the standards recommended by the commission for milk and cream; also, that all milk and cream used in the manufacture of ice cream be pasteurized.

Concerning the definition of ice cream, which was discussed at several meetings, the commission decided upon the following:

Ice cream is a frozen product made from pasteurized cream and sugar, or pasteurized cream and pasteurized milk and sugar, and shall contain not less than 8 per cent milk fat. It shall not contain any preservatives, neutralizing agent, saccharine, renovated or process butter, fats, or oils foreign to milk or to other ingredients allowed. It may contain wholesome eggs, harmless coloring matter, flavoring, sound, clean, mature fruits and nuts, pastries, and approved thickening not to exceed 0.5 per cent.

Ice cream should be kept frozen until dispensed. Synthetic cream (the product made by emulsifying homogenized butter with milk or skim milk) should not be recognized for ice cream or other cream purposes unless the methods and ingredients used be approved by the proper authorities.

Health officers are advised to allow nothing to be sold under the name of ice cream unless it comes under the above definition, with the further provision that it be manufactured and handled in a sanitary manner, the method of determining proper sanitation to be controlled by local officials.

Where there are no bacterial standards, the bacterial content should be used as a guide in checking sanitary conditions.

The use of substitutes for cream, such as emulsified fats, other than milk fats, should not be allowed for ice cream or other cream

purposes. If used, the finished product should not be labeled ice cream.

Grading.—Concerning the character of the products used in ice cream, the commission decided to recommend that milk products used in the manufacture of ice cream be restricted to the products of the grade A and grade B classes.

Grade A ice cream should be made from grade A milk or cream, and the finished product should contain not more than 100,000 bacteria per cubic centimeter.

Grade B ice cream should be made from milk or cream not lower than grade B, and the finished product should contain not more than 1,000,000 bacteria per cubic centimeter.

The commission recommends the use of a suitable score card in grading the sanitary condition of ice-cream factories.

A suggested score card is included in the appendix of this report.

(8) Condensed Milk.

The commission recognizes that in the manufacture of condensed milk, evaporated, powdered, and condensed milk products, the sanitary character of the raw milk used affects not only the keeping qualities but also the safety and decency of the finished product. It is clearly to the best interests of the public and the condensed-milk industry that condensed milk should be so labeled that the product prepared from fluid milk of a good quality may be distinguished from that prepared from inferior milk.

The commission therefore recommends the passage of Federal, State, and municipal legislation which will permit the manufacturer to state upon the label that his product has been prepared from grade A milk, and he shall be protected in the use of such a label.

(9) Skim milk.

The commission passed a resolution regarding the chemical standards for skim milk at one of its earliest sessions, recommending that skim milk should contain not less than 8.5 per cent of milk solids not fat.

In addition to this, regarding the food value of skim milk, the commission recommends that:

Whereas the pressure of the cost of living is increasing rapidly and vast quantities of nutritious and available food are now going to waste, and laws prohibiting the sale of skim milk have no public health significance; therefore, the commission recommends that the use of skim milk as a food be approved, and urges the repeal of laws wherever they exist that prohibit the sale of skim milk as a food.

(10) Buttermilk.

Concerning buttermilk the commission considered the subject at three of its sessions. As a definition of buttermilk the commission suggests:

That the sale of buttermilk should be restricted, first, to the product resulting from the churning of milk or cream that is produced under such conditions that when fresh it could be sold as grade A or grade B milk or cream, as such grades have been defined by this commission; or, second, to the product resulting from the skimming, souring, or treatment in any way of grade A or grade B milk, so that it resembles buttermilk (the true character of such imitation or artificial buttermilk to be distinctly stated on the container in every case), provided that all such buttermilk shall be handled during and after manufacture in a sanitary manner approved by the local health authorities, and that it shall be kept at a temperature below 50° F. from the time of manufacture until delivered to the consumer.

The commission recommends that all milk, cream, or skim milk entering into the manufacture of buttermilk be pasteurized, unless it can be shown that such milk or cream corresponds to grade A raw milk.

All buttermilk should be sold in bottles or cans that are properly sealed and labeled, with the name of the manufacturing plant, with either the day or date of manufacture, with the grade of milk from which it was manufactured, and with a statement as to whether it is manufactured from a raw or pasteurized product, and whether it is artificially or naturally prepared.

(11) Clarification.

The process of the clarification of milk has come into such wide use that the commission has felt it necessary to take cognizance of it, but it does not believe that it should be recommended as a required standard method. In its favor are the following points:

(*a*) It removes visible dirt.
(*b*) It removes inflammatory products, including many of the causative germs.
(*c*) It performs the work of the strainer, but in a much more efficient manner.

Against it are the following points:

(*a*) It removes visible dirt, but not all disease-producing germs and hence misleads the consumer as to the real purity of the milk.
(*b*) It does not remove urine or the soluble portions of feces; nevertheless, the milk appears clean.
(*c*) It adds another process requiring handling of the milk, complicating the situation.
(*d*) It largely destroys the value of the dirt test, though not more so than good straining.
(*e*) It breaks up clumps of bacteria and distributes them through milk.
(*f*) The exact nature of the material removed is not yet fully understood.

(12) Homogenization.

Concerning the subject of homogenized milk or cream, the commission bases its attitude on the principle of correct labeling. It is of the opinion that in the compounding of milk or cream, no fat other than milk fat from the milk in process should be used, and that no substance foreign to milk should be added to it.

The use of condensed milk or other materials for the thickening of cream is opposed unless the facts are clearly set forth on the label of the retail package.

Homogenized milk or cream should be marked as such, stating the percentage of fat it contains.

(13) Licenses.

A milk dealer should be required to have a permit or license to sell any grade or class of milk, and to use a label for such grade or class. Such permit or license should be granted only after the local health board has determined that the milk of the dealer actually belongs to the grade, and it should be revoked and the use of the label forbidden when it is determined that the milk is not in the grade or class designated.

(14) Labeling.

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. Besides the letter of the grade and the words "raw" or "pasteurized," there should be added sufficient statements to identify the milk as to its source and the time at which it was produced, bottled, or pasteurized; and no term descriptive of the quality of the milk other than the officially adopted grades should be authorized, unless such term is of a generally accepted meaning.

In dating milk uniform methods should be adopted for all grades of both raw milk and pasteurized milk, using the day of the week or the day of the month.

The sale of milk which is mislabeled or misbranded should be punished by revoking the dealer's license, reducing the milk to a lower grade, or by fines, or suitable penalties.

APPENDIX I.—FACTORS OF PRIMARY IMPORTANCE IN DAIRY PRACTICE FOR CONTROLLING THE SANITARY CHARACTER OF MILK.

In its last report the Commission placed in an appendix detailed regulations for the control of sanitary conditions in dairies and milk receiving stations.

The regulations given there have varying degrees of value in controlling the character of milk. Many add expense to the cost of production, and some, while they improve external appearances in the dairy, do not materially affect the quality of milk. The grading

system deals primarily with the character of the product, and the dairyman should give his special attention to such factors as will most effectively improve the character of the product.

Hence dairy inspectors should aim to place primary emphasis upon the factors that most largely affect the quality of the milk. The Commission urges all health officers and dairymen to separate the factors of primary importance from those of secondary importance. The following statements are not intended to replace more elaborate regulations given elsewhere but to show where the primary emphasis should be laid and to distinguish the more important measures from those that are of secondary importance in controlling the quality of milk.

In what follows it is assumed that other standard regulations are adopted, and that no milk is to be shipped from cows evidently diseased, or with sore udders, or milk handled by employees sick with any infectious disease, or carriers of disease germs.

Where milk is to be sold in a raw state, it is assumed that all cows will be under veterinary supervision, and tuberculin tested once each year, and dairy employees will be under regular medical inspection.

Under these conditions it is the opinion of the Commission that the following factors are most essential in putting on the market milk which is clean and contains a low bacterial count.

1. Financial Stimulus.

This factor underlies all others. Unless the dairyman can be convinced that it is to his financial advantage to produce clean milk, any attempt to purify the milk supply by legal statutes will be largely futile. To produce such a financial stimulus some form of grading milk is necessary in which the public will have confidence as being thoroughly reliable. This will involve:

(a) *The health officer.*—The milk must be graded by the proper authorities, and this should include constant bacteriological examination of the milk furnished by each producer for the purpose of grading.

(b) *The dealer.*—The milk should be paid for by the dealer according to its grade. The most effective results will be obtained so far as concerns cleanliness and sanitary character when the dealer pays the producer for milk on a scale based upon its bacterial count in addition to other factors.

The dealer should also thoroughly sterilize all milk containers by steam before returning them for refilling. It has been found that one of the greatest sources of trouble is the fact that the dealer returns to the producer cans which are not only not sterilized, but sometimes not even washed clean. No producer can furnish good

milk in such cans, but the dairyman is almost sure to be blamed for a condition for which the dealer is wholly responsible.

2. To produce milk of grade A or B, the producer will find the following factors the most efficient in controlling its cleanliness and its bacterial count:

(*a*) *Milking.*—Cows should have clean udders. Hands of the milker should be clean and dry. A small-topped milk pail should be used. With clean methods no strainer is needed, but if one is used it is preferably of cloth (cheese cloth) which has been sterilized by boiling. It is important that the same cloth shall not be used for the morning's milking and again for the night's milking. Two strainer cloths should be boiled, one used for the morning and the other for the night's milking.

(*b*) *Sterilizing.*—All milk vessels should be washed with a brush and with washing soda, or with alkaline powder and water, should be rinsed in clean water and sterilized. Where steam is available, this should be used for sterilizing, either as a jet of live steam or under pressure. Where steam is not available an abundance of boiling water should be used.

(*c*) *Cooling.*—The milk shall be cooled promptly to as low a temperature as is feasible with facilities available. Where this is done in a water tank and it is desired to stir the milk to facilitate the process, a wooden paddle of any kind must not be used. A metal stirrer may be used, which must be thoroughly washed and sterilized with boiling water each day. The lower the temperature to which the milk can be cooled, the easier it will be to produce milk of low bacterial count.

While other factors in milk production have their influence, extended tests show that 90 per cent of the high bacterial counts are attributable to the neglect of the above.

The above sanitary measures have special reference to the preservation of the sanitary character of milk during the process of milk production on the dairy farm. It is recognized that in addition to these, precautions must be observed in the milk factory or shipping station and on the railroad and in the city delivery station. In some cases the chief trouble is after the milk has left the dairy. In shipment three factors control the quality of the milk at its destination: Time, temperature, and cleanliness of utensils. Thorough refrigeration of milk in its progress from the dairy farm through the shipping station, on the railroad, and in the city station is essential to prevent large multiplication of bacteria. Washing and sterilizing of all vessels in which milk is contained, and of all apparatus with which it comes in contact is vital if contaminations are to be prevented that can easily destroy the sanitary character of milk which may have left the dairy farm in first-class condition. There is very little value in the practice of sanitary measures by the dairy farmer if the milk in the hands of the dealer is not properly refrigerated and handled in a sanitary manner.

Score Card for Ice-Cream Manufacturing Plants.

		Perfect.	Allow.
Location		15	
Above ground	5		
Free from contaminating surroundings (no score if bad)	3		
Protected from street dust	3		
Not connected with any other room	2		
No other business in same establishment	2		
Construction		15	
Well lighted (natural)	2		
Well ventilated	1		
Thoroughly screened	2		
Water-closet does not open directly into establishment	2		
Separate room for washing utensils	2		
Floor: Smooth, water-tight, well drained	4		
Walls and ceiling: Smooth and tight	2		
Equipment		30	
Steam at all times	5		
Hot water at all times (no credit unless running hot water)	3		
Sterilizer for utensils	3		
Connections for sterilizing apparatus	2		
Pasteurizer:			
Holding machine	4		
Automatic recording device	1		
Refrigeration: Mechanical (proper ice box, 1)	2		
Freezer: Type, connections, etc	2		
Sanitary piping	2		
Wash basins and towels ample	1		
Utensils:			
Condition	1		
Ample for the service	1		
Racks for	1		
Employees:			
Health certificates for	1		
Clean suits provided	1		
Methods		40	
Freedom from flies	2		
Protection of material:			
Before manufacture	3		
During manufacture	3		
After manufacture	3		
Utensils and apparatus sterilized (washed in hot water, 1)	3		
Cleanliness:			
Floors	3		
Windows	1		
Apparatus	3		
Walls and ceiling	1		
Utensils	3		
Employees	3		
Character of materials used:			
Milk and cream, grade A (grade B, 4; grade C, 1)	6		
Condensed milk, eggs, etc	2		
Thickeners, none used	1		
Artificial coloring, none	1		
Degree of refrigeration of final product	2		
Total		100	

APPENDIX 2.—HISTORY OF THE COMMISSION ON MILK STANDARDS APPOINTED BY THE NEW YORK MILK COMMITTEE.

Milk Grading Previous to the Commission's Organization.

In 1907 there was held a milk conference in Washington called by the Commissioners of the District of Columbia to report upon the milk supply of that city. At this conference Dr. A. D. Melvin offered a resolution proposing that milk be classified into three classes:

Class 1, certified milk; class 2, inspected milk; class 3, pasteurized milk.

In the first two classes the cows were to be tuberculin tested and the milk to have bacterial standards. The conference recommended this classification. The proposal was notable because it provided

for the pasteurization of all milk, with the exception of milk from tuberculin-tested cows, produced under sanitary conditions.

In 1908 the Board of Health of New York City adopted a classification of milk as follows:

Class 1, milk (ordinary market milk, raw or pasteurized); class 2, selected milk; class 3, inspected milk; class 4, guaranteed milk; class 5, certified milk.

Class 1 represented the bulk of the supply, and no provision was made requiring either pasteurization or a bacterial standard.

Organization of the Commission on Milk Standards.

In 1910, December 2 and 3, the New York Milk Committee held a conference on milk problems of leading milk authorities in America, at which the following resolution was adopted:

Resolved, That pending the adoption of national standards the conference on milk problems of the New York Milk Committee indorse the classification of milk recommended by A. D. Melvin, Chief of the Bureau of Animal Industry of the United States Department of Agriculture, approved by the milk conference of the District of Columbia, 1907, and published in Circular 114 of the Bureau of Animal Industry, and in Bulletins Nos. 41 and 56 of the United States Public Health and Marine Hospital Service.

(This classification designates three kinds of milk: Certified; inspected; pasteurized.)

This same conference also passed the following resolution:

Whereas it has been demonstrated by the papers and the discussions at this conference held at the invitation of the New York Milk Committee that it is imperative that definite standards and regulations should be adopted to govern the production and handling of dairy products for the prevention of disease and the saving of lives;

Resolved, That the New York Milk Committee be requested to invite between 12 and 20 recognized experts on milk problems to meet in conference, and that those experts be asked to make a unanimous report, recommending proper milk standards on which Congress or State authorities may formulate milk legislation.

In accordance with this resolution, in March, 1911, the New York Milk Committee, which is a voluntary organization working for the improvement of the milk supply of New York City and the reduction of infant mortality, invited 20 experts to become members of a commission on milk standards. These men were selected from a list of more than 200 men of prominence in medicine, sanitation, public health, and laboratory work, who were recognized as authorities on the milk question.

The members at the present time are as follows:

Dr. Carl L. Alsberg, Chief, Bureau of Chemistry, United States Department of Agriculture, Washington, D. C.

Dr. John F. Anderson, of E. R. Squibb & Sons, New Brunswick, N. J.

Dr. B. L. Arms, State Bacteriologist, Montgomery, Ala.

Prof. H. W. Conn, Director of Laboratory of State Board of Health, Middletown, Conn.

Dr. W. A. Evans, Department of Preventive Medicine, Northwestern University, Chicago, Ill.

Dr. Charles J. Hastings, Medical Officer of Health, Toronto, Canada.

Dr. J. N. Hurty, Secretary, State Board of Health, Indianapolis, Ind.

Dr. J. H. Landis, Health Officer, Cincinnati, Ohio.

Dr. E. C. Levy, Health Officer, Richmond, Va.

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

Dr. J. S. Neff, Narberth, Pa.

Dr. Charles E. North, 30 Church Street, New York City.

Dr. William H. Park, Director of Laboratories, Department of Health, New York City.

Mr. R. A. Pearson, President, College of Agriculture, Ames, Iowa.

Dr. M. P. Ravenel, Department of Preventive Medicine, University of Missouri, Columbia, Mo.

Prof. M. J. Rosenau, Department of Preventive Medicine and Hygiene, Harvard University, Cambridge, Mass.

Prof. H. C. Sherman, Department of Chemistry, Columbia University, New York City.

Dr. L. L. Van Slyke, Agricultural Experiment Station, Geneva, N. Y.

Mr. C. H. Wells, Health Officer, Montclair, N. J.

Dr. William C. Woodward, Health Officer, Washington, D. C.

In the list of names above there are eight public health officers, seven bacteriologists, three chemists, and two agricultural experts. Thirteen out of the number have been educated as physicians; two of the members have had long practical experience in the milk industry; six have been connected with the production and control of certified milk.

Purposes.

While this commission was created by and its expense is borne by the New York Milk Committee, it has not been the intention of the committee that the commission should have the New York City milk problem solely in mind. It was desired that the commission should make recommendations regarding milk standards and legislation that might be adopted by any city or town in the United States or Canada.

Meetings.

The first meeting of the commission was held at the New York Academy of Medicine on May 22, 1911. The subjects discussed included bacterial standards, chemical standards, and the grading and classification of milk. Several committees were appointed to report at the next meeting.

The second meeting of the commission was held at the New York Academy of Medicine, October 5 and 6, 1911, at which the reports of standing committees were received and resolutions adopted concerning bacterial standards, chemical standards, and grades and classes of milk. Special committees were appointed to consider certain specific matters. The commission tentatively recommended

that milk should be classified as follows: Certified; inspected; market; cooking; that there be bacterial standards and that the last two classes should be pasteurized.

January 4, 1912, the New York City Department of Health made an amendment to its sanitary code providing for a new classification of milk, as follows:

Grade A, for infants and children, including: Certified, guaranteed, inspected (raw), selected (pasteurized); grade B, for adults, including: Selected (raw), pasteurized; grade C, for cooking, including both raw and pasteurized.

It is noteworthy that this grading system made some use of the recommendations of the Commission on Milk Standards, but omitted any bacterial standards for grade B or grade C milk, and permitted the sale of raw, unpasteurized milk in all grades. At the same time it was recognized that this action of New York City was a great step in advance, and an indication that the commission's work gave promise of taking practical form.

First Report.

The third meeting of the commission was held at Homer, N. Y., January 25, and at the New York Academy of Medicine, January 26 and 27, 1912. At this meeting minor matters were voted upon and preparations made for the publication of a report of all of the commission's work. The first report appeared in the Public Health Reports of the United States Public Health Service, volume 27, No. 19, May 10, 1912; 70,000 copies of this report were distributed.

The fourth meeting of the commission was held in Chicago, October 29 and 30, 1912, at the time of the National Dairy Show. At this meeting the commission attended the annual convention of the International Milk Dealers' Association, and took part in a discussion of the classification of milk and milk standards with the leading representatives of the milk industry of the United States and Canada.

The fifth meeting of the commission was held in Richmond, Va., on May 2 and 3, 1913. By this time the commission had the benefit of numerous criticisms and suggestions which had been called forth by the first provisional report. At this meeting the commission made some radical modifications of its standards and grades, as follows:

(1) That in classifying milk the grades be designated by letters only, and not by such words as "certified," "inspected," "selected," etc.

(2) That the classification be changed to include only three grades:

Grade A, consisting of two classes, raw milk with a bacterial standard of 100,000 per cc., from tuberculin-tested cows (employees medically inspected); pasteurized milk with a bacterial standard of 100,000 per cc. before pasteurization and 10,000 per cc. after pasteurization.

Grade B, consisting of one class, with a bacterial standard of 1,000,000 before pasteurization and 50,000 after pasteurization.

Grade C, consisting of one class, over 1,000,000 before pasteurization and 50,000 after pasteurization.

Second Report.

The second report of the Commission on Milk Standards was published by the United States Public Health Service in the Public Health Reports of August 22, 1913, and contained the new grading system as above recommended. This report was endorsed by the American Public Health Association at its annual meeting at Colorado Springs, September 9–13, 1913.

(January 1, 1914, the New York City Department of Health amended their grading system so as to conform in its essential features to the new grading system recommended by the Commission on Milk Standards. This was soon followed by action by the New York State Department of Health in establishing a grading system for all towns and cities in the State. Later on the cities of Newark, N. J., Jersey City, N. J., Richmond, Va., Kansas City, Mo., adopted similar though not identical grading systems. The grading of milk is also being considered at the present time by the public health authorities of several other municipalities as well as States.)

The sixth meeting of the commission was held at the New York Academy of Medicine, April 13, 1914. At this time special attention was given to milk products and reports presented by the members of their own investigations on the sanitary and bacterial conditions of the ice cream and butter in various parts of the United States and Canada.

The seventh meeting of the commission was held in the Hotel Biltmore and the New York Academy of Medicine, May 7 and 8, 1915. On this occasion the Commission met the officers of a number of commercial organizations, including the National Ice Cream Dealers' Association, the National Creamery and Butter Makers' Association, and the International Milk Dealers' Association. The deliberations dealt chiefly with the subjects of butter, ice cream, and other milk products, and also with the questions of the control of certified milk and dairy inspection.

A special committee of the commission met in Washington on January 17, 1916, with the Joint Committee on Definitions and Standards appointed by the Bureau of Chemistry of the United States Department of Agriculture. The object of this meeting was to permit the members of the Commission on Milk Standards to present to the joint committee the results of the work of the Commission on Milk Standards, and to urge the Joint Committee on Definitions and Standards, which represents the food and dairy commissioners of the various States, the agricultural chemists, and the United States Department of Agriculture, to approve of the adoption of uniform milk standards for all of the States, and of the bacterial testing and grading of milk according to its sanitary character.

The eighth meeting was held May 19 and 20, 1916, in the New York Academy of Medicine. This meeting was especially effective because of the extensive work performed by the standing committees of the commission which held their own independent meetings in various parts of the United States several weeks in advance of the general meeting. As a consequence of this preparatory work, each committee brought in most complete and extensive reports of the subjects with which they had to deal. These subjects included: Ice cream, butter, condensed milk, standards for small communities, the significance of bacterial counts, essentials of dairy scoring, adjusted milk, clarification, pasteurization, tuberculin testing and other minor matters. This present report is a summary of the conclusions reached by the commission as a result of all of the sessions, and may be regarded as superseding the previous reports.

PREVALENCE OF DISEASE.

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring.

UNITED STATES.

ANTHRAX.

Massachusetts Report for January, 1917.

During the month of January, 1917, one case of anthrax was reported in Massachusetts.

CEREBROSPINAL MENINGITIS.

State Reports for January, 1917.

Place.	New cases reported.	Place.	New cases reported.
Massachusetts:		Massachusetts—Continued.	
Bristol County—		Worcester County—	
New Bedford	1	Milford (town)	1
Hampden County—		Worcester	1
Springfield	1		
Hampshire County—		Total	11
Northampton	1		
Ware (town)	1	Wisconsin:	
Middlesex County—		Langlade County	1
Lowell	1	Milwaukee County	2
Suffolk County—			
Boston	4	Total	3

State Reports for December, 1916.

During the month of December, 1916, one case of cerebrospinal meningitis was reported in Hamakua District, Hawaii, and two cases were reported in Billings, Mont.

City Reports for Week Ended Jan. 27, 1917.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
Binghamton, N. Y.	1	1	New York, N. Y.	9	2
Boston, Mass.	1	1	Philadelphia, Pa.	1	2
Chicago, Ill.	2	1	Pittsburgh, Pa.	1	1
Detroit, Mich.	1	.....	Providence, R. I.	2	1
Dubuque, Iowa	1	1	St. Joseph, Mo.	1	1
Hartford, Conn.	1	.....	St. Louis, Mo.	4	2
Kansas City, Mo.	.....	1	San Francisco, Cal.	1	1

DIPHTHERIA.

See Diphtheria, measles, scarlet fever, and tuberculosis, page 304.

ERYSIPELAS.

City Reports for Week Ended Jan. 27, 1917.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
Ann Arbor, Mich	1		New York, N. Y		6
Binghamton, N. Y	2		Niagara Falls, N. Y	1	
Bridgeport, Conn	3		Omaha, Nebr	1	
Buffalo, N. Y	5	1	Pasadena, Cal	1	
Butler, Pa	1		Philadelphia, Pa	7	1
Chicago, Ill	40	3	Pittsburgh, Pa	6	2
Cincinnati, Ohio	1		Portland, Oreg	1	
Cleveland, Ohio	9	2	Providence, R. I		1
Cumberland, Md	1		Reading, Pa	1	
Denver, Colo	2	1	Rochester, N. Y	7	1
Detroit, Mich	6	2	St. Joseph, Mo	2	
Duluth, Minn	4		St. Louis, Mo	22	2
Erie, Pa	2		St. Paul, Minn	3	1
Grand Rapids, Mich	2	1	San Diego, Cal	2	
Jackson, Mich	1		San Francisco, Cal	2	1
Kalamazoo, Mich	3		Springfield, Ill	1	
Lincoln, Nebr	1		Toledo, Ohio	1	2
Los Angeles, Cal	1		Troy, N. Y		1
Milwaukee, Wis	4	1	Wichita, Kans	2	1
Newark, N. J	8		Wilkinsburg, Pa	1	

GLANDERS.

Massachusetts—Springfield—Human Case.

Collaborating Epidemiologist Kelley reported the occurrence of a case of glanders at Springfield, Mass., in a colored woman, A. J., age 45 years, residence 217 Tyler Street. The patient was admitted to hospital December 17, 1916, and died January 8, 1917. The diagnosis was confirmed bacteriologically, but the source of infection was not determined.

LEPROSY.

Hawaii Report for November and December, 1916.

During the month of November, 1916, one case of leprosy was reported in the Territory of Hawaii, and during the month of December, 1916, eight cases were reported.

MEASLES.

Alaska—Ketchikan.

Acting Asst. Surg. Story reported that during the week ended January 27, 1917, 14 new cases of measles were notified at Ketchikan, Alaska, making a total of 78 cases, with 1 death, reported since the beginning of the present outbreak, about December 15, 1916.

Washington—Seattle.

Surg. Lloyd reported that during the period from January 21 to February 3, 1917, 335 cases of measles, with 1 death, were notified at Seattle, Wash., making a total of 6,286 cases of the disease, with 10 deaths, reported since the beginning of the outbreak, February 15, 1916.

See also Diphtheria, measles, scarlet fever, and tuberculosis, page 304.

PELLAGRA.

District of Columbia Report for January, 1917.

During the month of January, 1917, one case of pellagra was reported in the District of Columbia.

City Reports for Week Ended Jan. 27, 1917.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
Charleston, S. C.	.....	1	New York, N. Y.	1	1
New Orleans, La.	2	2			

PNEUMONIA.

City Reports for Week Ended Jan. 27, 1917.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
Alameda, Cal.	3	1	McKeesport, Pa.	2	3
Allentown, Pa.	1	.....	Newark, N. J.	81	19
Baltimore, Md.	40	31	New Castle, Pa.	2	.....
Binghamton, N. Y.	6	1	Norristown, Pa.	1	.....
Birmingham, Ala.	1	15	Oakland, Cal.	1	8
Braddock, Pa.	2	.....	Pasadena, Cal.	1	1
Chicago, Ill.	319	156	Philadelphia, Pa.	140	88
Cincinnati, Ohio.	1	16	Pittsburgh, Pa.	32	46
Cleveland, Ohio.	44	38	Racine, Wis.	2	2
Coffeyville, Kan.	2	.....	Reading, Pa.	3	4
Detroit, Mich.	6	36	Rochester, N. Y.	21	5
Dubuque, Iowa.	2	2	Rockford, Ill.	4	3
Flint, Mich.	6	.....	Saginaw, Mich.	4	2
Grand Rapids, Mich.	4	5	St. Paul, Minn.	1	7
Harrison, N. J.	1	.....	Sandusky, Ohio.	1	.....
Johnstown, Pa.	2	4	San Francisco, Cal.	11	5
Kalamazoo, Mich.	7	3	Schnectady, N. Y.	3	2
Kansas City, Mo.	5	20	Toledo, Ohio.	1	6
Lancaster, Pa.	3	.....	Topeka, Kans.	1	.....
Lexington, Ky.	4	4	Wichita, Kans.	3	1
Lincoln, Nebr.	3	4	Wilkinsburg, Pa.	4	.....
Los Angeles, Cal.	12	8	York, Pa.	2	1
Manchester, N. H.	9	9			

POLIOMYELITIS (INFANTILE PARALYSIS).

State Reports for January, 1917.

Place.	New cases reported.	Place.	New cases reported.
Massachusetts:		Massachusetts—Continued.	
Bristol County—		Plymouth County—	
Easton (town)	1	Abington (town)	1
Essex County—		Suffolk County—	
Haverhill	1	Boston	5
Lawrence	1		
North Andover (town)	1	Total	11
Rockport (town)	1		
Franklin County—		Wisconsin:	
Shelburne (town)	1	Milwaukee County	1
Hampden County—		Racine County	1
Springfield	1		
Middlesex County—		Total	2
Somerville	1		

POLIOMYELITIS (INFANTILE PARALYSIS)—Continued.

Montana Report for December, 1916.

Place.	New cases reported.
Montana:	
Blaine County	1
Flathead County	1
Musselshell County	1
Total	3

City Reports for Week Ended Jan. 27, 1917.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
Boston, Mass	3	.....	New York, N. Y	3	3
Chicago, Ill	2	.....	Niagara Falls, N. Y	1	.....
Cleveland, Ohio	1	.....	Philadelphia, Pa	4	.....
Harrisburg, Pa	1	.....	San Francisco, Cal	.....	1
Lincoln, Nebr	.....	1	Zanesville, Ohio	1	1

RABIES IN ANIMALS.

City Reports for Week Ended Jan. 27, 1917.

During the week ended January 27, 1917, five cases of rabies in animals were reported in Buffalo, N. Y., one case was reported in Detroit, Mich., and one case in Rochester, N. Y.

SCARLET FEVER.

See Diphtheria, measles, scarlet fever, and tuberculosis, page 304.

SMALLPOX.

California—San Francisco.

Passed Asst. Surg. Williams reported February 9, 1917, the presence of smallpox in San Francisco, Cal., 22 cases of the disease, with 1 death, having been notified to date of report.

Connecticut.

Collaborating Epidemiologist Black reported that during the week ended February 10, 1917, 8 new cases of smallpox were notified in Connecticut as follows: Stonington 2, Waterbury 6.

Minnesota.

Collaborating Epidemiologist Bracken reported that during the week ended February 10, 1917, 7 new foci of smallpox infection were reported in Minnesota, cases of the disease having been notified as follows: Hubbard County, Akeley 5; White Oak Township 2; Lyon County, Balaton 1; Morrison County, Morrill Township 5; Sherburn County, Elk River 2; Stearns County, Kimball 1; Waseka County, Otisco Township 1.

SMALLPOX—Continued.

Texas—Galveston.

Surgeon Bahrenburg reported that on February 13, 1917, three cases of smallpox were notified at Galveston, Tex.

Miscellaneous State Reports.

Place.	Cases.	Deaths.
Hawaii (Nov. 1-30):		
Oahu—		
Honolulu	1	
Massachusetts (Jan. 1-31):		
Berkshire County—		
Lee (town)	1	
Worcester County—		
Worcester	1	
Total	2	
Montana (Dec. 1-31):		
Cascade County	2	
Great Falls	4	
Custer County	3	
Dawson County	1	
Fergus County	5	
Flathead County	9	
Gallatin County	7	
Hill County	27	
Madison County	2	
Ravalli County	1	
Sheridan County	17	
Silverbow County	2	
Butte	4	
Valley County	6	
Yellowstone County—		
Billings	3	
Total	93	
Wisconsin (Jan. 1-31):		
Buffalo County	1	
Chippewa County	5	
Clark County	2	
Dane County	1	
Eau Claire County	4	
Jackson County	1	
Juneau County	2	
Manitowoc County	7	
Marathon County	5	
Milwaukee County	29	
Monroe County	1	
Oneida County	1	
Outagamie County	2	
Ozaukee County	2	
Polk County	1	
Portage County	1	
Rock County	1	
Sheboygan County	1	
Trempealeau County	9	
Washburn County	11	
Waukesha County	5	
Total	92	

City Reports for Week Ended Jan. 27, 1917.

Place.	Cases.	Deaths.
Ann Arbor, Mich	1	
Austin, Tex	6	
Braddock, Pa	1	
Chicago, Ill	1	
Cleveland, Ohio	10	
Danville, Ill	3	
Detroit, Mich	5	
Flint, Mich	1	
Fort Worth, Tex	2	1
Indianapolis, Ind	6	
Jersey City, N. J	1	
Kalamazoo, Mich	1	
Kansas City, Mo	1	
Little Rock, Ark	1	
Minneapolis, Minn	19	
Muscatine, Iowa	1	
New Orleans, La	7	
New York, N. Y	1	
Norfolk, Va	1	
Ogden, Utah	1	
Oklahoma, Okla	3	
Omaha, Nebr	9	
Philadelphia, Pa	1	
Portsmouth, Va	1	
Rockford, Ill	1	1
St. Joseph, Mo	1	
St. Paul, Minn	5	
San Diego, Cal	1	
San Francisco, Cal		1
Seattle, Wash	1	
Sioux City, Iowa	9	
Springfield, Ill	1	
Toledo, Ohio	1	1
Topeka, Kans	11	
Worcester, Mass	1	

TETANUS.

City Reports for Week Ended Jan. 27, 1917.

Place.	Cases.	Deaths.
New Castle, Pa	1	
New Orleans, La		1
New York, N. Y		2
St. Joseph, Mo	1	1
St. Louis, Mo	1	1

TUBERCULOSIS.

See Diphtheria, measles, scarlet fever, and tuberculosis, page 304.

TYPHOID FEVER.

State Reports for January, 1917.

Place.	New cases reported.
District of Columbia	11
Massachusetts:	
Berkshire County—	
North Adams	2
Bristol County—	
Fall River	9
New Bedford	2
Taunton	1
Essex County—	
Amesbury (town)	1
Haverhill	2
Ipswich (town)	1
Lawrence	11
Lynn	2
Hampden County—	
Holyoke	2
Ludlow (town)	1
Hampshire County—	
Easthampton (town)	1
Middlesex County—	
Cambridge	2
Everett	1
Lowell	1
Malden	1
Medford	1
Newton	4
Reading (town)	1
Westford (town)	1
Norfolk County—	
Dedham (town)	1
Quincy	1
Plymouth County—	
Bridgewater (town)	2
Brockton	2
Suffolk County—	
Boston	8
Chelsea	3
Massachusetts—Continued.	
Worcester County—	
Dudley (town)	1
Leominster (town)	1
Southbridge (town)	2
Westboro (town)	1
Worcester	2
Total	71
Wisconsin:	
Barron County	2
Brown County	3
Clark County	1
Door County	1
Fond du Lac County	1
Green County	11
Kewaunee County	2
Lafayette County	1
Manitowoc County	1
Marathon County	1
Marinette County	1
Milwaukee County	3
Oconto County	7
Outagamie County	1
Price County	1
Richland County	2
Rock County	1
St. Croix County	1
Washburn County	1
Winnebago County	2
Wood County	3
Total	47

State Reports for December, 1916.

Place.	New cases reported.
Hawaii:	
Hawaii—	
Hilo	1
North Kohala District	6
Kauai—	
Koloa District	4
Makaweli District	1
Waimea District	2
Maui—	
Wailuku District	1
Oahu—	
Ewa District	1
Honolulu	14
Koolaupoko District	1
Total	31
Montana:	
Blaine County	1
Cascade County—	
Great Falls	2
Hill County	1
Musselshell County	3
Yellowstone County	2
Total	9

TYPHOID FEVER—Continued.

Hawaii Report for November, 1916.

Place.	New cases reported.	Place.	New cases reported.
Hawaii:		Hawaii—Continued.	
Hawaii—		Oahu—	
Hamakua District	1	Ewa District	1
Hilo	6	Honolulu	4
North Hilo District	1	Koolaupoko District	3
Puna District	1		
South Hilo District	1	Total	26
Kauai—			
Koloa District	2		
Lihue District	6		

City Reports for Week Ended Jan. 27, 1917.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
Atlantic City, N. J.	3		Manchester, N. H.	1	1
Baltimore, Md.	12	5	Milwaukee, Wis.	2	1
Beaver Falls, Pa.	1		Newark, N. J.	1	
Binghamton, N. Y.	1		New Castle, Pa.	1	
Birmingham, Ala.		2	New Orleans, La.	4	2
Boston, Mass.	1		Newton, Mass.	2	
Brockton, Mass.	2		New York, N. Y.	14	
Buffalo, N. Y.	3	1	Norfolk, Va.	2	
Canton, Ohio.	1		Norristown, Pa.	1	
Charleston, S. C.	1		Omaha, Nebr.		1
Chelsea, Mass.		1	Philadelphia, Pa.	5	3
Chicago, Ill.	12		Pittsburgh, Pa.	1	1
Cincinnati, Ohio.	1		Portland, Oreg.		1
Cleveland, Ohio.	1		Reading, Pa.	2	
Columbus, Ohio.	4	2	Rochester, N. Y.	1	
Concord, N. H.	1		Sacramento, Cal.	1	
Denver, Colo.	2	1	St. Joseph, Mo.	1	
Detroit, Mich.	10	1	St. Louis, Mo.	4	1
Duluth, Minn.	1		St. Paul, Minn.	2	
East Chicago, Ind.	2		San Diego, Cal.	3	
El Paso, Tex.	2		San Francisco, Cal.	3	1
Fall River, Mass.	2		Schenectady, N. Y.	1	
Flint, Mich.	3	1	South Bend, Ind.	2	1
Fort Wayne, Ind.	6		Syracuse, N. Y.	1	
Galveston, Tex.	2		Toledo, Ohio.	3	1
Grand Rapids, Mich.	1		Trenton, N. J.		1
Indianapolis, Ind.	1		Watertown, N. Y.	1	
Kansas City, Mo.	2		Wheeling, W. Va.	2	
Lancaster, Pa.	2		Wilkes-Barre, Pa.	1	
Lawrence, Mass.	3		Wilkinsburg, Pa.	1	
Lincoln, Nebr.	1		Wilmington, Del.	2	1
Los Angeles, Cal.	2		Wilmington, N. C.		1
Lowell, Mass.	1		Zanesville, Ohio		1
Lynn, Mass.	1				

TYPHUS FEVER.

City Report for Week Ended Jan. 27, 1917.

During the week ended January 27, 1917, two cases of typhus fever were reported in El Paso, Tex.

PREVENTABLE DISEASES.

Massachusetts Report for Week Ended Feb. 3, 1917.

	Cases reported.		Cases reported.
Cerebrospinal meningitis	1	Scarlet fever	159
Chicken pox	176	Septic sore throat	4
Diphtheria	211	Smallpox	1
Dog bite	2	Trachoma	1
German measles	27	Tuberculosis (pulmonary)	164
Measles	547	Tuberculosis (other forms)	18
Mumps	197	Typhoid fever	8
Ophthalmia neonatorum	43	Whooping cough	62

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS.

State Reports for January, 1917.

During the month of January, 1917, 60 cases of diphtheria, 89 cases of measles, and 58 cases of scarlet fever were reported in the District of Columbia; 869 cases of diphtheria, 1,886 cases of measles, and 675 cases of scarlet fever were reported in Massachusetts; and 231 cases of diphtheria, 256 cases of measles, and 730 cases of scarlet fever were reported in Wisconsin.

State Reports for December, 1916.

During the month of December, 1916, 13 cases of diphtheria and 4 cases of measles were reported in the Territory of Hawaii, and 12 cases of diphtheria, 122 cases of measles, and 42 cases of scarlet fever were reported in Montana.

Hawaii Report for November, 1916.

During the month of November, 1916, 9 cases of diphtheria and 12 cases of measles were reported in the Territory of Hawaii.

City Reports for Week Ended Jan. 27, 1917.

City.	Population as of July 1, 1916 (estimated by U. S. Census Bureau).	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Over 500,000 inhabitants:										
Baltimore, Md	589,621	.....	21	1	8	.....	9	.....	45	35
Boston, Mass	756,476	272	68	6	74	1	35	1	60	17
Chicago, Ill	2,497,722	868	220	35	333	5	419	13	241	81
Cleveland, Ohio	674,073	241	35	1	49	2	28	.....	24	18
Detroit, Mich	571,784	248	95	4	4	.....	133	5	64	25
Los Angeles, Cal	503,812	.....	22	.....	52	1	10	.....	61	28
New York, N. Y	5,602,841	.....	246	25	210	4	131	2	619	221
Philadelphia, Pa	1,709,518	689	76	6	13	.....	24	1	136	81
Pittsburgh, Pa	579,090	226	24	2	127	1	10	1	22	19
St. Louis, Mo	757,309	227	83	4	159	.....	77	.....	57	14
From 300,000 to 500,000 inhabitants:										
Buffalo, N. Y	468,558	160	20	3	3	.....	13	.....	36	10
Cincinnati, Ohio	410,476	180	25	1	12	.....	8	1	27	16
Jersey City, N. J	306,345	115	11	.....	3	.....	22	.....	20	9

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City Reports for Week Ended Jan. 27, 1917—Continued.

City.	Population as of July 1, 1916 (estimated by U. S. Census Bureau).	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
From 300,000 to 500,000 inhabitants—Continued.										
Milwaukee, Wis	436,535	140	24	5	10	1	111	.....	17	8
Minneapolis, Minn	363,454	.....	28	.....	7	.....	21	.....	.....	.....
Newark, N. J	408,894	119	20	.....	6	.....	24	1	35	16
New Orleans, La	371,747	.....	7	1	644	8	2	.....	32	39
San Francisco, Cal	463,516	193	28	2	150	.....	49	.....	42	28
Seattle, Wash	348,639	51	.....	.....	180	.....	9	.....	20	7
Washington, D. C	363,980	183	7	1	38	.....	15	.....	19	14
From 200,000 to 300,000 inhabitants:										
Columbus, Ohio	214,878	65	3	.....	86	2	5	.....	9	5
Denver, Colo	260,800	87	6	.....	65	.....	2	.....	.....	18
Indianapolis, Ind	271,708	.....	24	.....	29	.....	8	.....	11	.....
Kansas City, Mo	297,847	111	7	3	32	.....	57	.....	11	20
Portland, Oreg	295,463	62	1	.....	58	.....	5	.....	1	3
Providence, R. I	254,960	102	13	1	3	.....	13	.....	.....	8
Rochester, N. Y	256,417	83	8	1	3	1	34	.....	18	5
St. Paul, Minn	247,232	53	5	.....	6	.....	9	.....	14	9
From 100,000 to 200,000 inhabitants:										
Birmingham, Ala	181,762	63	3	.....	105	2	4	.....	7	9
Bridgeport, Conn	121,579	58	10	.....	19	.....	4	.....	9	3
Cambridge, Mass	112,981	40	19	1	10	1	9	.....	6	3
Camden, N. J	106,233	.....	1	.....	1	.....	5	.....	1	.....
Fall River, Mass	128,366	49	6	1	56	2	.....	.....	15	5
Fort Worth, Tex	104,562	33	3	.....	9	.....	2	.....	.....	2
Grand Rapids, Mich	128,291	54	1	.....	6	.....	20	.....	5	4
Hartford, Conn	110,900	56	8	.....	1	.....	1	.....	4	6
Lawrence, Mass	100,560	47	6	.....	.....	.....	2	.....	9	2
Lowell, Mass	113,245	43	11	.....	30	.....	1	.....	7	8
Lynn, Mass	102,425	36	6	3	.....	.....	5	.....	5	5
New Bedford, Mass	118,158	25	1	.....	.....	.....	1	.....	6	3
New Haven, Conn	149,685	.....	6	.....	44	.....	3	.....	5	2
Oakland, Cal	198,604	.....	1	.....	13	.....	6	.....	3	5
Omaha, Nebr	165,470	26	1	.....	9	.....	9	.....	1	2
Reading, Pa	109,381	34	1	.....	1	.....	3	.....	3	1
Richmond, Va	156,687	93	4	2	24	.....	5	.....	5	6
Salt Lake City, Utah	117,399	37	2	.....	83	1	10	1	.....	.....
Springfield, Mass	105,942	40	10	.....	1	.....	18	.....	2	1
Syracuse, N. Y	155,624	46	8	.....	11	.....	9	.....	8	3
Toledo, Ohio	191,554	86	2	.....	3	.....	63	1	7	11
Trenton, N. J	111,593	55	3	.....	.....	.....	4	.....	2	6
Worcester, Mass	163,314	61	8	.....	1	.....	11	1	12	7
From 50,000 to 100,000 inhabitants:										
Allentown, Pa	63,505	29	5	1	.....	.....	4	.....	1	.....
Atlantic City, N. J	57,660	11	.....	.....	32	.....	1	.....	.....	.....
Bayonne, N. J	69,893	.....	3	.....	.....	.....	1	.....	5	.....
Berkeley, Cal	57,653	6	.....	.....	2	.....	1	.....	.....	.....
Binghamton, N. Y	53,973	31	10	.....	30	.....	3	.....	2	2
Brockton, Mass	67,449	20	3	.....	2	.....	.....	.....	1	.....
Canton, Ohio	60,852	9	3	.....	.....	.....	5	.....	3	.....
Charleston, S. C	60,734	25	7	.....	1	.....	3	.....	.....	.....
Covington, Ky	57,144	21	1	1	.....	.....	.....	.....	.....	1
Duluth, Minn	94,495	.....	1	.....	4	.....	6	.....	3	.....
Elizabeth, N. J	86,690	20	11	.....	1	.....	3	.....	3	2
El Paso, Tex	63,705	47	2	.....	7	.....	1	.....	.....	7
Erie, Pa	75,195	.....	.....	.....	3	.....	.....	.....	2	.....
Flint, Mich	54,772	22	2	.....	2	.....	8	.....	.....	1
Fort Wayne, Ind	76,183	25	1	.....	.....	.....	2	.....	.....	3
Harrisburg, Pa	72,015	35	6	1	2	.....	.....	.....	.....	4
Hoboken, N. J	77,214	20	1	.....	1	.....	13	.....	11	3
Johnstown, Pa	68,529	28	2	.....	5	.....	2	.....	1	.....
Lancaster, Pa	50,853	.....	2	.....	.....	.....	.....	.....	.....	.....
Little Rock, Ark	57,343	10	2	.....	15	.....	1	.....	.....	.....
Malden, Mass	51,155	7	1	.....	1	.....	3	.....	1	.....
Manchester, N. H	78,283	29	1	.....	1	.....	1	1	.....	.....
Mobile, Ala	58,221	16	.....	.....	1	.....	.....	.....	1	3
New Britain, Conn	53,794	.....	.....	.....	.....	.....	3	.....	.....	1
Norfolk, Va	89,612	9	.....	.....	7	.....	.....	.....	.....	1
Oklahoma City, Okla	92,943	36	1	.....	30	2	2	1	1	3
Passaic, N. J	71,744	28	.....	.....	.....	.....	2	.....	2	2

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City Reports for Week Ended Jan. 27, 1917—Continued.

City.	Population as of July 1, 1916 (estimated by U. S. Census Bureau).	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
From 50,000 to 100,000 inhabitants—Continued.										
Pawtucket, R. I.	59,411	31	2							1
Portland, Me.	63,867	26	7	1			1			2
Rockford, Ill.	55,185	17			2		1		1	1
Sacramento, Cal.	66,895	37			2		4			5
Saginaw, Mich.	55,642	14	2	1			6			
St. Joseph, Mo.	85,236	38	3		4		1			3
San Diego, Cal.	53,330	23	1		2				18	
Schenectady, N. Y.	99,519	19	1		22		9		6	
Sioux City, Iowa.	57,078		1				2			
Somerville, Mass.	87,039	25	1		6		4		1	
South Bend, Ind.	68,946	17			1		13	1	3	1
Springfield, Ill.	61,120	29	3	1	7		3			2
Troy, N. Y.	77,916		2	1	33	1	5		7	5
Wichita, Kans.	70,722		1	1					2	
Wilkes-Barre, Pa.	76,776	30	3				5		4	3
Wilmington, Del.	94,265	51	1				1	1		
York, Pa.	51,656		3				2		3	
From 25,000 to 50,000 inhabitants:										
Alameda, Cal.	27,732	3	1		9		10			
Auburn, N. Y.	37,385	15			2		1		1	
Austin, Texas	34,814	10	2							
Brookline, Mass	32,730	19			4				3	1
Butler, Pa.	27,632	9					1			
Chelsea, Mass.	46,192	22	3						5	
Chicopee, Mass.	29,319	9							4	2
Cumberland, Md.	26,074	5							1	
Danville, Ill.	32,261	10					2			
Davenport, Iowa.	48,811		2				4			
Dubuque, Iowa.	39,873				30		1		2	2
East Chicago, Ind.	28,743						2			2
East Orange, N. J.	42,458	13			5				3	2
Elgin, Ill.	28,203	11			58		1			
Everett, Mass.	39,233	6			1		3			
Everett, Wash.	35,486	6			69		1			
Fitchburg, Mass.	41,781	9			1				2	
Galveston, Tex.	41,863	16								1
Haverhill, Mass.	48,477		5		4					
Jackson, Mich.	35,363	12	6		8		7	1	2	
Kalamazoo, Mich.	48,886	17			1		1		3	
Kenosha, Wis.	31,576	6	2	1			1			1
Kingston, N. Y.	26,771	18	1				1		2	2
Knoxville, Tenn.	38,676		1		59		1		3	
La Crosse, Wis.	31,677	9	2				2		1	
Lexington, Ky.	41,097	22			19		1	1	1	2
Lima, Ohio.	35,384		1		1		1		1	
Lincoln, Nebr.	46,515	14	6		15		5			
Long Beach, Cal.	27,587	18								
Lorain, Ohio.	36,964		2				6		3	
Lynchburg, Va.	32,940	15	1		31					4
Madison, Wis.	30,699				1		11			
McKeesport, Pa.	47,521	9	2				3		1	
Medford, Mass.	26,234	9	1		13					
Montclair, N. J.	26,318	11	1		1					2
Newburgh, N. Y.	29,603	10	3	1						1
New Castle, Pa.	41,133		1		3				1	
Newport, R. I.	30,108	13	3				1			2
Newton, Mass.	43,715	19			18		3			
Niagara Falls, N. Y.	37,353	19	5		9		3		2	
Norristown, Pa.	31,401	11	5							1
Ogden, Utah.	31,404	9			39		5			
Orange, N. J.	33,080	11	1						1	
Pasadena, Cal.	46,450	14	3							2
Perth Amboy, N. J.	41,185		1				2			
Pittsfield, Mass.	38,629	11					1			1
Portsmouth, Va.	39,651	16	1		9		5			
Quincy, Ill.	36,798	20								2
Quincy, Mass.	38,136	12			2		2		4	
Racine, Wis.	46,486	9								1
Roanoke, Va.	43,284	15	1		49				3	1
San Jose, Cal.	38,902	10	2		2				3	

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City Reports for Week Ended Jan. 27, 1917—Continued.

City.	Population as of July 1, 1916 (estimated by U. S. Census Bureau).	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
From 25,000 to 50,000 inhabitants—Continued.										
Steubenville, Ohio	27,445	12					1			
Superior, Wis	46,226	5	1							
Taunton, Mass	36,283	22	2						2	3
Topeka, Kans	48,726	14	1		46		1			
Waltham, Mass	30,570	8							2	1
Watertown, N. Y	29,894	12	1		2					
West Hoboken, N. J	43,139	10	2				1		3	1
Wheeling, W. Va	43,377	23			4					4
Williamsport, Pa	33,869		1				1			
Wilmington, N. C	29,892	9							3	
Winston-Salem, N. C	31,155	23	3		75	1	13	1	2	3
Zanesville, Ohio	30,863	11					2		2	2
From 10,000 to 25,000 inhabitants:										
Ann Arbor, Mich	15,010	8					3		1	2
Braddock, Pa	21,685								2	
Cairo, Ill	15,794	9	1		8					1
Clinton, Mass	[1] 13,075	9	1		3		1			1
Coffeyville, Kans	17,548								1	
Concord, N. H	22,669	12	2							
Galesburg, Ill	24,276	14								
Harrison, N. J	16,950		3							
Kearny, N. J	23,539								1	
Kokomo, Ind	20,930	7	3		10				1	1
Long Branch, N. J	15,295	3			1					
Marinette, Wis	[1] 14,610	5								2
Morristown, N. J	13,284	8								1
Muscatine, Iowa	17,500				54	1				
Nanticoke, Pa	23,126	10	2							
Newburyport, Mass	15,243	2			3		1			1
New London, Conn	20,985	8	1							1
North Adams, Mass	[1] 22,019	5	1		1		2			
Northampton, Mass	19,926	8	1				2		2	
Plainfield, N. J	23,805	10					1		1	
Rocky Mount, N. C	12,067	7	2	1	62					
Rutland, Vt	14,831	5	1		20		2			
Sandusky, Ohio	20,193				2					
Saratoga Springs, N. Y	13,821	6								
Steelton, Pa	15,548	2	1							
Wilkinsburg, Pa	23,228		1		4					1
Woburn, Mass	15,969	5								

[1] Population Apr. 15, 1910; no estimate made.

FOREIGN.

CUBA.

Communicable Diseases—Habana.

Communicable diseases have been notified at Habana as follows:

Disease.	Jan. 11-20, 1917.		Remaining under treatment Jan. 20, 1917.	Disease.	Jan. 11-20, 1917.		Remaining under treatment Jan. 20, 1917.
	New cases.	Deaths.			New cases.	Deaths.	
Diphtheria	6		7	Scarlet fever	6		9
Malaria	21		65	Smallpox	1		2
Measles	15		14	Typhoid fever	6		36
Paratyphoid fever	1		3	Varicella	1		2

GREAT BRITAIN.

Examination of Rats—Hull.

During the two weeks ended January 20, 1917, 38 rats were examined at Hull. Of these, 16 were from dock warehouses and 20 from vessels in dock. No plague infection was found.

INDIA.

Comparative Immunity from Plague—Rat Destruction—Madras City.

The annual report of the health officer of Madras for the year 1915 states that between January, 1905, and June, 1906, there were reported in Madras 103 indigenous cases of plague. These cases occurred in fishing districts of the city and the infection did not spread to the crowded sections. Since June, 1906, no indigenous cases of plague have been known to occur in the city. Rat destruction has been carried on at Madras, with a total of 133,970 rats destroyed during the year 1915.

Reports of plague at Madras received during the year 1916 show the occurrence of 1 case during the first week in January and from September 24 to December 16, 1916, 6 cases with 4 deaths.

SIAM.

Quarantine Against Arrivals from Hongkong.

On account of the presence of smallpox at Hongkong, China, quarantine detention at the island of Koh Phra was ordered, December 13, 1916, to be enforced for all vessels arriving in Siamese waters from Hongkong.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER.

Reports Received During the Week Ended Feb. 16, 1917.[1]

CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
India:				
Calcutta	Nov. 26-Dec. 2	.....	21	
Japan:				
Taiwan Island (Formosa)—				
Keelung	Dec. 17-23	.....	3	
Taihoku	do	1	2	
Philippine Islands:				
Manila	Dec. 24-30	3	2	Not previously reported: Cases, 5.
Provinces		.....	.....	Dec. 24-30, 1916: Cases, 133; deaths, 87.
Albay	Dec. 24-30	12	4	
Antique	do	12	9	
Capiz	do	21	17	
Cavite	do	7	7	
Cebu	do	12	6	
Iloilo	do	6	3	
Leyte	do	46	31	
Misamis	do	5	5	
Negros Occidental	do	11	5	
Rizal	do	1	.....	
Turkey in Asia		.....	.....	Nov. 4-Dec. 12, 1916. Cases, 69, deaths, 36.
Bagdad	Nov. 6-30	17	6	
Beirut	Dec. 7-12	2	1	
Tarsus	Nov. 7	1	1	
Turkey in Europe:				
Constantinople	Nov. 14-17	2	.....	

PLAGUE.

Ceylon:				
Colombo	Nov. 5-11	5	4	
China:				
Hongkong	Dec. 24-30	1	1	
Japan:				
Nagoya	Dec. 10-16	2	.....	
Yokkaichi	Nov. 19-Dec. 16	23	8	

SMALLPOX.

Canada:				
Ontario—				
Sarnia	Jan. 28-Feb. 3	2	.....	
Toronto	do	2	.....	
China:				
Chungking	Dec. 10-23	.....	.....	Present.
Harbin	Nov. 13-19	1	.....	
Mukden	Dec. 24-30	.....	.....	Do.
Do	Dec. 31-Jan. 6	.....	.....	Do.
Tientsin	Dec. 17-30	1	1	
Egypt:				
Alexandria	Dec. 25-31	.....	3	
Cairo	Sept. 3-9	4	2	
Port Said	do	1	1	
India:				
Calcutta	Nov. 26-Dec. 2	.....	1	
Japan:				
Kobe	Jan. 1-7	1	.....	
South Africa:				
Johannesburg	Nov. 26-Dec. 2	15	.....	
Spain:				
Malaga	Sept. 1-Oct. 31	.....	2	
Seville	Dec. 1-31	.....	13	
Valencia	Dec. 31-Jan. 13	2	.....	
Switzerland:				
Basel	Nov. 5-11	1	.....	
Do	Dec. 31-Jan. 6	1	.....	
Tunisia:				
Tunis	Jan. 6-12	12	5	

[1] From medical officers of the Public Health Service, American consuls, and other sources.

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

Reports Received During the Week Ended Feb. 16, 1917—Continued.

TYPHUS FEVER.

Place.	Date.	Cases.	Deaths.	Remarks.
Austria-Hungary:				
Austria—				
Vienna	Dec. 10-16	5		
Egypt:				
Alexandria	Dec. 25-31	9	3	
Cairo	Sept. 3-16	21	8	
Germany:				
Königsberg	Dec. 31-Jan. 6		1	
Great Britain:				
Cork	Jan. 7-13		1	
Sweden:				
Stockholm	Jan. 23-30	1		
Switzerland:				
Zurich	Jan. 7-13	1		

Reports Received from Dec. 30, 1916, to Feb. 9, 1917.

CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
India:				
Bombay	Nov. 5-Dec. 23	13	12	
Calcutta	Oct. 15-Dec. 9		52	
Madras	Nov. 5-Dec. 16	5		
Rangoon	Nov. 26-Dec. 16	2	3	
Indo-China				June 1-July 31, 1916: Cases, 3,578; deaths, 2,578.
Provinces—				
Anam	June 1-July 31	904	691	
Cambodia	do	8	6	
Cochin-China	do	231	144	
Kouang-Tcheou-Wan	July 1-31	83	62	
Laos	June 1-July 31	433	417	
Tonkin	June 1-30	1,276	775	
Japan:				
Fukuoka	Jan. 19	33		
Nagasaki	Nov. 27-Dec. 3	9	4	
Osaka	Nov. 16-Dec. 5	8	11	Aug. 13-Dec. 5, 1916: Cases, 966; deaths, 625.
Do	Jan. 6-16	9		
Taiwan Island—				
Keelung	Nov. 13-Dec. 9	5	4	
Taihoku	do	13	3	
Yokohama	Nov. 6-Dec. 3	5	3	
Districts	do	1	1	
Java:				
West Java				Nov. 17-30, 1916: Cases, 16; deaths, 11.
Batavia	Nov. 17-30	1	1	
Philippine Islands:				
Manila	Oct. 29-Dec. 23	198	68	Not previously reported: Cases, 44; deaths, 2.
Provinces				Oct. 29-Dec. 9, 1916: Cases, 4,191; deaths, 2,030.
Albay	Oct. 29-Dec. 9	246	147	
Do	Dec. 17-23	8	6	
Antique	Nov. 18-25	8	7	
Bataan	Oct. 29-Dec. 9	93	77	
Do	Dec. 17-23	2	2	
Batangas	Oct. 29-Nov. 18	1	1	
Bohol	Oct. 29-Dec. 9	46	18	
Do	Dec. 17-23	1		
Bulacan	Oct. 29-Dec. 9	96	67	
Do	Dec. 17-23	10	6	
Camarines	Oct. 29-Dec. 9	61	37	
Capiz	do	45	34	
Do	Dec. 17-23	6	6	
Cavite	Oct. 29-Dec. 9	156	113	
Do	Dec. 17-23	17	6	
Iloilo	Oct. 29-Dec. 9	237	148	
Do	Dec. 17-23	31	28	
Laguna	Nov. 5-25	12	10	
Leyte	Oct. 29-Dec. 9	127	98	
Do	Dec. 17-23	44	31	

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

Reports Received from Dec. 30, 1916, to Feb. 9, 1917—Continued.

CHOLERA—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Philippine Islands—Contd.				
Provinces—Continued.				
Masbate	Dec. 17–23	8	2	
Misamis	Oct. 29–Dec. 9	126	79	
Do	Dec. 17–23	12	7	
Negros Occidental	Oct. 29–Dec. 9	910	553	
Pampanga	Dec. 3–9	4	3	
Do	Dec. 17–23	6	5	
Rizal	Oct. 29–Dec. 9	27	14	
Do	Dec. 17–23	3	.....	
Samar	Nov. 5–18	13	10	
Sorsogon	Oct. 29–Dec. 2	131	71	
Do	Dec. 17–23	1	2	
Tayabas	Nov. 5–18	1	1	
Zambales	Oct. 29–Dec. 2	7	1	
Straits Settlements:				
Singapore	Oct. 22–28	2	2	
Turkey in Asia	Sept. 22–Nov. 3	189	81	
Turkey in Europe:				
Constantinople	Oct. 1–29	6	1	

PLAGUE.

Brazil:				
Bahia	Nov. 5–Dec. 2	13	9	Jan. 1–Nov. 11, 1916: Cases, 14; deaths, 7. Nov. 5–11: Cases, 4; deaths, 2.
Joazeiro				June 1–Nov. 6, 1916: Cases, 67; deaths, 51.
Ceylon:				
Colombo	Oct. 28–Dec. 9	24	15	July 23–29, 1916: Cases, 9; deaths, 8.
China:				
Amoy, vicinity	Nov. 19–Dec. 2	.....	.....	Present.
Kansu Province—				
Taochow	Oct. 1–24	.....	20	Pneumonic. Reported present in other localities in Province.
Ecuador				Sept. 1–Nov. 30, 1916: Cases, 156; deaths, 57.
Duran	Oct. 1–31	1	.....	
Guayaquil	Sept. 1–30	21	7	
Do	Oct. 1–31	43	13	
Do	Nov. 1–30	88	35	
Milagro	....do	1	.....	
Nobol	Oct. 1–31	1	1	
Santa Rosa	Sept. 1–30	1	1	
Egypt				Jan. 1–Dec. 30, 1916: Cases, 1,702; deaths, 828.
Alexandria	Nov. 12–Dec. 25	4	3	1 case on s. s. Proton, arrived Nov. 16, 1916, from Sidi Barand and Sollum.
Port Said	Dec. 11	1	.....	
India				Oct. 15–Dec. 9, 1916: Cases, 62,977; deaths, 47,146.
Bassein	Oct. 22–Dec. 2	.....	3	
Bombay	Nov. 5–Dec. 23	64	49	Oct. 8–14, 1916: Cases, 13; deaths, 7. Received out of date. Original report lost on s. s. Arabia.
Karachi	Oct. 29–Dec. 23	3	2	
Madras	Nov. 19–Dec. 16	6	3	Oct. 8–14, 1916: Cases, 1; deaths, 1.
Madras Presidency	Nov. 5–Dec. 16	4,003	2,677	Oct. 8–14, 1916: Cases, 534; deaths, 353. Sept. 17–23, 1916: Cases, 429; deaths, 280.
Mandalay	Oct. 28–Nov. 18	.....	2	
Moulmein	Dec. 3–9	.....	1	
Prome	Oct. 22–Dec. 9	.....	96	
Rangoon	Oct. 28–Dec. 16	27	24	Oct. 1–7, 1916: Cases, 9; deaths, 9.
Toungoo	Oct. 22–Dec. 9	.....	10	
Indo-China				June 1–July 31, 1916: Cases, 168; deaths, 104.
Provinces—				
Anam	June 1–July 31	44	29	
Cambodia	....do	35	33	
Cochin-China	....do	62	36	
Kouang-Tcheou-Wan	July 1–31	27	6	
Saigon	Nov. 6–19	3	1	
Japan:				
Yokkaichi	Nov. 12–Dec. 9	9	4	

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

Reports Received from Dec. 30, 1916, to Feb. 9, 1917—Continued.

PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Java:				
East Java—				
Djocja Residency	Nov. 4-17	1	1	
Kediri Residency	Aug. 26-Sept. 22	12	10	
Pasoeroean Residency	do	2	2	
Surabaya Residency	Nov. 4-17	13	13	Surabaya City, Nov. 4-17, 1916: Cases, 5; deaths, 5.
Surakarta Residency	do	6	6	
Mid-Java—				
Samarang	do	1	1	
Siam:				
Bangkok	Oct. 22-Nov. 18	4	3	
Straits Settlements:				
Singapore	do	5	5	
Union of South Africa:				
Cape of Good Hope State—				
Uitenhage district	Oct. 31-Nov. 12	2	2	Total, Oct. 23-Nov. 12, 1916: Cases, 24; deaths, 13.

SMALLPOX.

Austria-Hungary:				
Austria—				
Vienna	Nov. 12-Dec. 9	8	1	
Hungary—				
Budapest	Nov. 5-Dec. 9	69	1	
Brazil:				
Bahia	Nov. 12-Dec. 2	4	.....	
Rio de Janeiro	Nov. 12-Dec. 30	50	12	
China:				
Amoy	Oct. 31-Dec. 9	.....	.....	Present.
Chungking	Oct. 28-Dec. 9	.....	.....	Do.
Dairen	Nov. 5-Dec. 26	48	8	
Foochow	Oct. 29-Dec. 16	.....	.....	Do.
Harbin	Nov. 6-12	1	.....	
Hongkong	Oct. 28-Dec. 9	105	71	
Mukden	Dec. 9-23	.....	.....	Do.
Nanking	Nov. 12-25	.....	.....	Do.
Tsingtao	Dec. 1-9	3	.....	
Cuba:				
Casa Blanca	Jan. 12	1	.....	Vicinity of Habana. Case landed Jan. 1, 1917, from s. s. Alfonso XII, from Santanter, Spain.
Encrucijada	Jan. 10	1	.....	In Santa Clara Province. Case landed from s. s. Montevideo from Barcelona, via Las Palmas, Canary Islands, and Porto Rico; arrived at Habana Jan. 6, 1917.
Guanabacoa	Jan. 9	1	.....	Vicinity of Habana. Case landed from s. s. Montevideo.
Habana	Jan. 10-20	2	.....	At Mariel quarantine station. From s. s. Montevideo.
Ecuador:				
Guayaquil	Nov. 1-30	10	1	
Egypt:				
Cairo	June 11-July 1	50	20	
Do	July 2-Aug. 19	50	17	
Port Said	June 11-17	1	1	
France:				
Marseille	Oct. 1-Nov. 30	.....	14	
Hawaii:				
Honolulu	Jan. 9	1	.....	From s. s. Tenyo Maru from oriental ports.
Do	Jan. 24	1	.....	From s. s. Ecuador from Hongkong.
India:				
Bombay	Dec. 10-23	3	.....	Oct. 8-14, 1916: Cases, 3; deaths, 3. Received out of date. Original report lost on s. s. Arabia.
Calcutta	Nov. 5-11	.....	1	
Madras	Nov. 5-Dec. 16	22	8	
Moulmein	Oct. 28-Nov. 4	.....	4	
Rangoon	Oct. 28-Dec. 16	14	1	

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

Reports Received from Dec. 30, 1916, to Feb. 9, 1917—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Indo-China				June 1-July 31, 1916: Cases, 111; deaths, 35.
Provinces—				
Anam	June 1-July 31	14	6	
Cambodia	do	21	7	
Cochin-China	do	48	16	
Tonkin	do	28	6	
Saigon	Nov. 6-Dec. 10	26	6	
Japan:				
Kobe	Dec. 4-10	1	1	
Java:				
East Java				Sept. 16-Nov. 10, 1916: Cases, 21; deaths, 1.
Surabaya	Nov. 4-10	1		
Mid-Java				Sept. 16-Nov. 17, 1916: Cases, 51; deaths, 3.
Samarang	Nov. 4-10	3		
West Java				Sept. 29-Nov. 30, 1916: Cases, 206 deaths, 32.
Batavia	Sept. 29-Nov. 30	16	2	
Mexico:				
Mexico City	Dec. 10-30	20		
Do	Dec. 31-Jan. 6	6		
Nuevo Laredo	Dec. 10-30	1		
Portugal:				
Lisbon	Nov. 19-Dec. 2	6		
Portuguese East Africa:				
Lourenco Marques	Sept. 1-30		1	
Russia:				
Moscow	Oct. 16-Dec. 18	43	12	Nov. 13-25, 1916: Cases, 35; deaths, 8.
Archangel	Nov. 25-Dec. 8	5		
Petrograd	Oct. 8-Nov. 25	95	31	
Spain:				
Cadiz	Nov. 1-30		2	
Madrid	do		91	
Seville	do		22	
Valencia	Nov. 19-Dec. 23	5	1	
Straits Settlements:				
Penang	Oct. 28-Dec. 2	7	2	
Singapore	Nov. 19-Dec. 9	2	1	
Tunisia:				
Tunis	Nov. 25-Dec. 15	51	27	
Do	Dec. 30-Jan. 5	8	4	
Turkey in Asia:				
Trebizond	Nov. 11-Dec. 16	1	1	
Union of South Africa:				
Johannesburg	Sept. 10-Nov. 28	25		

TYPHUS FEVER.

Argentina:				
Rosario	Nov. 1-30		1	
Austria-Hungary:				
Austria—				
Vienna	Nov. 5-Dec. 23	15	1	
Hungary—				
Budapest	do	1		
Belgium:				
Ghent	Oct. 29-Nov. 4		1	
Liege	do		1	
China:				
Antung	Nov. 27-Dec. 10	6		
Hankow	Nov. 12-18	1		
Tientsin	Oct. 29-Nov. 4	1		
Cuba:				
Santiago	Dec. 7-13	1	1	
Egypt:				
Alexandria	Nov. 12-Dec. 26	19	9	Nov. 19-25, 1916: 1 case; Dec. 17-23, 1916: Cases, 4.
Cairo	June 11-July 1	275	142	
Do	July 2-Aug. 19	211	111	
Port Said	June 11-17	20	9	
Do	July 2-Aug. 19	5	5	
Germany:				
Berlin	Oct. 15-Dec. 9		5	
Bremen	Oct. 22-Nov. 18	1	2	
Frankfort-on-Main	Nov. 12-18		1	
Königsberg	Nov. 12-Dec. 23	5	5	
Nuremberg	Oct. 29-Nov. 11	3		

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

Reports Received from Dec. 30, 1916, to Feb. 9, 1917—Continued.

TYPHUS FEVER—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Great Britain:				
Glasgow	Dec. 3-30	4		
Greece:				
Saloniki	Nov. 7-Dec. 4		21	
Java:				
East Java				Sept. 16-22, 1916: Cases, 2.
Mid-Java				Sept. 16-Nov. 10, 1916: Cases, 21; deaths, 2.
Samarang	Nov. 4-10	7		
West Java				Sept. 29-Nov. 30, 1916: Cases, 53; deaths, 3.
Batavia	Sept. 29-Nov. 30	44	3	
Mexico:				
Aguascalientes	Dec. 22			Epidemic.
Ciudad Juarez				July, 1916-Feb. 5, 1917: Cases, 100 (estimated).
Durango	Dec. 12			Present.
Mexico City	Dec. 3-30	835		
Do	Dec. 31-Jan. 6	162		
Nuevo Laredo	Dec. 10-16	4		July 1-Dec. 16, 1916: Cases, 28.
Netherlands:				
Rotterdam	Nov. 26-Dec. 30	8		
Russia:				
Moscow	Oct. 16-Nov. 25	55	4	
Archangel	Nov. 25-Dec. 8	10	4	
Petrograd	Oct. 8-Dec. 2	139	42	
Spain:				
Madrid	Nov. 1-30		2	
Sweden:				
Stockholm	Nov. 28-Dec. 4	1		
Switzerland:				
Zurich	Dec. 3-9	1		
Tunisia:				
Tunis	Dec. 16-22	1		
Turkey in Asia:				
Haifa	Oct. 16-22	1		

YELLOW FEVER.

Brazil:				
Victoria	Jan. 27			Present.
Ecuador:				
Babahoyo	Nov. 1-30	1	1	
Chobo	....do	1		
Duran	Oct. 1-31	1		
Guayaquil	Sept. 1-30	17	5	
Do	Oct. 1-31	15	12	
Do	Nov. 1-30	6	3	
Milagro	Sept. 1-30	1		
	Oct. 1-31	2	1	
Gold Coast				In 1915: Cases, 2; deaths, 2. European and native.