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THE NECESSITY FOR SAFE WATER SUPPLIES IN THE CONTROL OF TYPHOID FEVER.[1]

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The excessive prevalence of typhoid fever in the United States has been characterized, and not without reason, as a national disgrace. Certainly that portion of our typhoid prevalence which is due to polluted water supplies is preventable, and our failure to prevent does not redound to our credit. The rather common use of sewage polluted water supplies without purification has been responsible for disaster in the shape of typhoid-fever epidemics in our cities, with a frequency not pleasant to contemplate. Such supplies untreated and unfiltered are exposed also to contamination from persons ill with or harboring the germs of Asiatic cholera should such persons gain access to the United States.

It is useless to expect that the dejecta of all persons ill with typhoid fever or cholera will be properly disinfected before reaching the sewers, especially if the contributor is a carrier who shows no signs of illness. It is evident that the surest and most prompt protection against water-borne diseases can be afforded in each case by proper treatment or filtration of the public water supplies. With cholera, we have only the menacing possibility, but with typhoid fever we have the actual existence of the disease in such a high rate of prevalence that the United States suffers seriously by comparison with other civilized countries.

The average American citizen displays toward sanitary problems a very dangerous apathy. It is difficult to arouse his interest in anything so well known as typhoid fever. Cholera or plague or any scourge which to him suggests a quick and mysterious death will awaken his instinct of self-preservation and arouse him to activity; not so typhoid fever. It has been all about him always, excites no terror, and is viewed indifferently as an inevitable visitation which comes every year and takes its toll from the community. He never asks himself, Is this visitation inevitable? Or, May not typhoid fever be prevented or reduced? Twenty deaths per 100,000 probably represent 200 cases of typhoid fever. Suppose 200 cases of Asiatic cholera occurred in any American city of 100,000 population, would not strenuous activity be displayed and very properly so for the eradication of the scourge? Although the case mortality rate of typhoid fever is lower than that of cholera, yet typhoid fever is transmissible

[1] Read Mar. 5, 1912, before the Illinois Water Supply Association at Urbana, Ill.

in more ways, is more expensive in its lingering course, and more disastrous in its sequelæ than Asiatic cholera. The mental attitude toward typhoid fever, displayed by many physicians and especially health officers, is scarcely more commendable. Their complacency in the face of typhoid fever rates of above 20 deaths annually per 100,000 population is difficult to explain. If the rate is below 20, many municipal officials are inclined to be satisfied with this rate as it is low compared with less fortunate cities.

What may be considered a low rate for typhoid fever? Table 1 shows the death rates per 100,000 population in 10 large European cities. The average for 10 years is given in the first column. The average for 5 years in the second column. The other columns show the rate for the individual years from 1906 to 1910, inclusive. The figures are given for 10 years to show that the low rates are consistent and not a mere coincidence. These 10 cities represent a population of about 15 million persons, and the average death rate per 100,000 population for the 10 years was only 3.4. The rates are gradually getting lower and the rate for these 10 cities combined, with a population of 15 millions, was only 2.5 in 1910.

TABLE 1.—*Annual death rates from typhoid fever per 100,000 population in 10 European cities.*

	Average for 10 years, 1901–1910.	Average for 5 years, 1901–1905.	1906	1907	1908	1909	1910
Stockholm	1.7	3	2	2	1	5	1.8
Christiania	2.4	3	4	2	2	1.7	1.6
Munich	2.5	4	2	3	3	1.9	1.4
Edinburgh	2.9	8	3	3	2	1.2	.3
Vienna	3.7	4	5	3	4	2.8	3.8
Hamburg	3.7	4	4	3	4	3.3	4.1
Berlin	3.8	4	4	4	4	4.2	2.9
Dresden	4.2	4	7	2	6	4.2	2.2
Copenhagen	4.5	8	4	2	7	2.7	3.6
London	4.7	8	6	4	5	2.2	3.3

Table 2 shows 15 other European cities which in 1909 and 1910 did not reach double figures in typhoid death rates per 100,000 population. These 15 cities represent a total population of over 9 millions. The average rate for the total population was only 5.3 in 1909 and 4.5 in 1910.

TABLE 2.—*Annual death rates from typhoid fever per 100,000 population in 15 other European cities.*

City.	1909	1910
Frankfort	1.5	0.9
Antwerp	1.0	2.3
Bristol	2.8	2.1
Nuremberg	2.6	.....
Birmingham	5.0	3.9
Belfast	5.2	3.9
Lyon	5.8	4.4
Leeds	7.2	3.8
Liverpool	8.4	3.9
Sheffield	9.4	3.0
Rotterdam	6.4	6.5
Amsterdam	3.8	6.7
Paris	8.4	5.6
Bradford	4.3	9.2
Leipsig	8.3	7.5
Total average rate	5.3	4.5

Table 3 shows the remaining eight cities in northern Europe with populations in excess of 300,000. These eight cities have a population of about 7½ millions. Their total average rate for 1909 was 13.9, and for 1910, 15.6. These rates would be considered low in America, but the European officials consider the persistence of such rates to be a reflection.

TABLE 3.—*Annual death rates from typhoid fever per 100,000 population in 8 other European cities.*

City.	1909	1910
Glasgow	12.5	6.4
Budapest	9.4	13.6
Brussels	7.4	16.1
Dublin	15.7	12.2
Manchester	13.9	10.3
Moscow	13.8	15.0
Warsaw	13.5	17.4
St. Petersburg	25.2	33.7
Total average	13.9	15.6

To recapitulate, in northern Europe the 33 principal cities, with an aggregate population of 31,500,000, had an average typhoid death rate per 100,000 population of 6.5 in 1909 and 1910. This includes such notorious typhoid centers as St. Petersburg, which had a rate of 33.7 in 1910. The rate in St. Petersburg is considered to be due to the water supply, which is partly filtered and partly raw Neva water.

It is clear that in cities which have had safe water supplies for a period of years the rate should not be above 5 per 100,000 unless some unusual condition exists, such as poor control of milk or lack of control over patients and carriers. Now let us compare typhoid-fever rates in American cities.

Table 4 shows our honor roll for 1909 and 1910. These are the typhoid-fever death rates among the 50 cities in the United States with more than 100,000 inhabitants. One city, Bridgeport, Conn., has a rate below 5. Three cities—Paterson, N. J., Cincinnati, Ohio, and Cambridge, Mass.—have rates below 10 per 100,000. Twenty-two other cities have rates of from 11 to 20 deaths per 100,000, and the remaining 24 cities have rates of from 20 to 86.

TABLE 4.—*Annual death rates from typhoid fever per 100,000 population in 50 cities of the United States having more than 100,000 inhabitants.*

City.	1909	1910
Birmingham, Ala	59.7	49.5
Los Angeles, Cal	16.1	14.2
Oakland, Cal	11.2	16.5
San Francisco, Cal	13.9	15.5
Denver, Colo	24.1	27.5
Bridgeport, Conn	9.0	4.9
New Haven, Conn	20.5	17.9
Washington, D. C	34.3	23.2
Atlanta, Ga	50.6	50.1
Chicago, Ill	12.6	13.7
Indianapolis, Ind	22.3	28.5
Louisville, Ky	45.0	31.7
New Orleans, La	28.4	31.5
Baltimore, Md	24.9	42.0
Boston, Mass	13.8	11.3
Cambridge, Mass	7.7	9.5
Fall River, Mass	21.3	15.0

TABLE 4.—*Annual death rate from typhoid fever per 100,000 population in 50 cities of the United States having more than 100,000 inhabitants*—Continued.

City.	1909	1910
Lowell, Mass.	10.5	19.7
Worcester, Mass.	8.4	15.7
Detroit, Mich.	20.5	23.0
Grand Rapids Mich.	17.2	28.3
Minneapolis, Minn.	21.0	58.7
St. Paul, Minn.	18.9	19.5
Kansas City, Mo.	29.3	54.4
St. Louis, Mo.	16.2	14.9
Omaha, Nebr.	36.8	86.7
Jersey City, N. J.	8.8	11.5
Newark, N. J.	11.9	13.1
Paterson, N. J.	9.7	7.1
Albany, N. Y.	19.0	14.0
Buffalo, N. Y.	23.8	20.4
New York, N. Y.	12.1	11.6
Rochester, N. Y.	9.4	13.7
Syracuse, N. Y.	11.2	28.2
Cincinnati, Ohio.	13.3	8.8
Cleveland, Ohio.	13.3	17.9
Columbus, Ohio.	19.6	18.1
Dayton, Ohio.	26.9	21.4
Toledo, Ohio.	41.7	37.2
Portland, Oreg.	22.0	22.4
Philadelphia, Pa.	22.3	17.5
Pittsburgh, Pa.	24.6	27.8
Scranton, Pa.	16.4	16.9
Providence, R. I.	11.4	17.9
Memphis, Tenn.	48.8	27.4
Nashville, Tenn.	52.0	48.9
Richmond, Va.	24.1	21.9
Seattle, Wash.	23.8	14.2
Spokane, Wash.	43.2	45.4
Milwaukee, Wis.	21.4	45.7

These 50 registration cities in the United States have an aggregate population of over 20,000,000. The aggregate typhoid death rate in these cities for 1910 was 25 per 100,000 inhabitants.

Unit of comparison	Aggregate population.	Deaths per 100,000 from typhoid fever, 1910.
33 principal European cities in Russia, Sweden, Norway, Austria-Hungary, Germany, Denmark, France, Belgium, Holland, England, Scotland, and Ireland	31,500,000	6.5
50 American cities of 100,000 inhabitants or over	20,250,000	25.0
Excess of deaths from typhoid fever in American cities		18.5

So that on an average in every 100,000 population we had, compared with European results, 18.5 deaths and at least 180 cases of typhoid fever which should never have occurred. A conservative estimate for 1910 will place the deaths from typhoid fever above 25,000. When we consider that the smaller cities in America have in general higher rates than the larger, that the rural typhoid is high and in many sections higher than the urban, that in the sections not included in the registration area sanitary conditions are probably worse and typhoid fever rates higher than within the area, we are forced to conclude that a general rate of 25 is probably below the actual deaths from typhoid fever per 100,000 population in the entire United States.

The excess of 18 deaths per 100,000 in the urban population alone shows that we have had in the 50 cities mentioned above, at

least, 3,600 deaths and probably 36,000 cases of typhoid fever which were preventable and should never have occurred. For the whole United States the number of cases for each year preventable by methods within our grasp would probably reach 175,000, and the deaths so avoided would total 16,200. In 1909 there were more cases of typhoid fever in the United States than there were cases of plague in India in spite of the fact that India's population is two and one-half times that of the United States.

From January, 1907, to October, 1911, there occurred in Russia 283,684 cases of Asiatic cholera. This included the appalling epidemic of 1910. According to a conservative estimate there occurred in the United States during the same period one million and a quarter cases of typhoid fever, or more than 4 cases of typhoid fever in the United States for every case of cholera in Russia. We heard a great deal of the terrible ravages of cholera in Italy in 1910–11; yet in these two years there occurred in Italy about 16,000 cases of cholera, with about 6,000 deaths, and in the United States in the same period we had more than a half million cases of typhoid fever and 50,000 deaths.

We are accustomed to speak of certain countries as pest ridden, and a residence in them or even a brief visit is considered with apprehension. But do we consider the prevalence of typhoid fever in our own country with sufficient seriousness? The annual 25,000 deaths from typhoid fever do not represent our total loss. At a conservative estimate they are accompanied by a quarter of a million of cases of the disease each year.

These cases represent an average illness for each individual of four weeks and probably six or eight weeks enforced abstinence from any gainful occupation. The economic loss is appalling, and, computing the value of the lives lost to the community, the cost of medical attendance and hospital care, the loss of earning capacity for many weeks, the decreased earning capacity and impaired efficiency due to sequelæ, would reach a sum of not less than $100,000,000 annually.

To understand fully the menace of typhoid fever, one must remember that it can not be prevented by ordinary personal cleanliness as typhus fever may be prevented, and is not confined to the poor and dirty, but reaches all classes.

It is not something we have in childhood and consign to history, as scarlet fever or measles, but a disease which attacks the most robust adult individuals during the period of their greatest activity and their greatest economic value to the community. Typhoid fever is a disease against which the individual is helpless,[1] and protection of the individual can be effected only by sanitary control of the entire food and drink supply and the sanitary disposal of human excreta.

Time will not permit the discussion of the whole problem of typhoid-fever transmission, and I shall confine myself to the water-borne typhoid solely. This is done with a full appreciation of the great importance of the other factors in typhoid transmission, viz, milk, control of patients and carriers, contact, flies, and rural typhoid.

No single measure in reducing typhoid fever on a large scale approaches the effect of substituting a safe for a polluted water supply. As an instance of this wholesale saving of human life, the reduction

[1] Vaccination against typhoid protects the individual in the great majority of cases. As a general means of protection of the civilian population, it is not likely to prove practicable, however, although of immense advantage in protecting military units against typhoid where compulsory vaccination is feasible.

of typhoid fever in Pittsburgh may be cited. Since the installation of the Pittsburgh plants there has been an annual saving in the city of 400 lives from typhoid fever alone. Installation of safe water supplies in America has not always produced brilliant results, but the failure to reach the low figures attained by the Germans is due principally to three things: First, failure to supply pure water to all; second, imported cases, usually from communities which are typhoid centers; third, existence of insanitary conditions, such as contaminated wells, outdoor privies, and lack of control over milk and excreta.

As an instance of high rate due to failure to furnish filtered water to all the people, the experience of Pittsburgh is interesting. The filter plant in Pittsburgh was first put in operation November, 1907. But a small portion of filtered water was supplied at first and this was mixed with the unfiltered supply. The amount of water filtered was increased until October, 1908, when the supply of that part of the city between the rivers—about three-fifths of the total population—was filtered.

The south side, a little less than one-fifth of the entire population, was supplied with filtered water in March, 1909. The former city of Allegheny, recently annexed, is not yet supplied with filtered water. This part of the city includes a population of about one-fourth of the entire city.

There was a remarkable decrease of typhoid fever in Pittsburgh progressively coincident with the increase of area supplied with filtered water. In spite of all this remarkable reduction two points stand out prominently: First, the rate is still high (1910), and, second, the seasonal distribution suggests water as a prime factor. Explanation of these two points is furnished by a study of the cases as shown in Table 5, from which it is clear that water was responsible for the high rate, and that this high rate was due entirely to the abnormal rate in wards 21 to 27, inclusive.

TABLE 5.—*Typhoid-fever deaths by wards, Pittsburgh, Pa., 1910.*[1]

	Population.	Typhoid deaths.		Population.	Typhoid deaths.
Ward 1	11,623	3	Ward 15	20,141	3
Ward 2	14,386	1	Ward 16	20,833	1
Ward 3	26,462	3	Ward 17	25,213	3
Ward 4	25,055	11	Ward 18	17,994	1
Ward 5	24,495	2	Ward 19	23,482	3
Ward 6	26,261	3	Ward 20	18,648	2
Ward 7	13,263	1	Ward 21	22,506	11
Ward 8	18,204	0	Ward 22	15,716	9
Ward 9	17,795	6	Ward 23	21,799	13
Ward 10	21,205	3	Ward 24	17,354	6
Ward 11	17,066	2	Ward 25	16,037	5
Ward 12	22,342	2	Ward 26	15,291	6
Ward 13	24,080	2	Ward 27	23,580	12
Ward 14	13,074	1			

[1] These figures were furnished by the health department of the city of Pittsburgh.

Total population of Pittsburgh	533,905
Total deaths typhoid fever	115
Death rate per 100,000, entire city	21.3
Death rate per 100,000, wards 1 to 20	13.4
Death rate per 100,000, wards 21 to 27	46.9

Wards 1 to 20 were supplied with filtered water. The aggregate population of these 20 wards was 401,622. The typhoid-fever death

rate per 100,000 in 1910 was 13.4. Wards 21 to 27 comprise the old city of Allegheny and have a total population of 132,283. This section received unfiltered water. The typhoid-fever death rate per 100,000 in this section in 1910 was 46.9.

The absolute necessity of a safe water supply—and by "safe" a supply is meant which is safe 365 days in the year—in seeking to rid ourselves of the odium of water-borne typhoid, is obvious. The installation of such a supply, however, has another powerful effect upon the typhoid-fever rate. The existence of a pure public water supply makes possible the elimination of the dangerous shallow well and filthy yard privy. With a contaminated or unsightly public supply a vigorous campaign against the insanitary privy and contaminated well is impossible. The householder is as a rule unwilling to close his well and connect his premises with the public water mains unless the city water appears to be better than that obtained from the well. When water connections have once been made, water closets or other suitable toilet facilities are usually installed as a matter of convenience and the yard privy is no longer needed and its use, therefore, is discontinued.

The conditions which make disaster possible where the source of public water supply is polluted are two, viz:

1. Failure to purify.
2. Inefficiency of the purification.

The failure to install a purification plant is usually due to an undue confidence in a water supply which is safe "most of the time." It is difficult for some officials to understand, without a severe lesson, that it is not sufficient to have a water supply that is safe for 360 or 361 days in the year, and to these officials it seems scarcely justifiable to require expensive purification for the sake of the four or five days in the year during which, due to weather conditions, pollution may take place. Such a supply, with a favorably placed intake, may escape pollution for more than a year. There was no evidence of serious pollution of the water supply of the city of Erie during the year 1909, yet the appalling disaster of January and February, 1911, showed that pollution could take place under certain weather conditions.

There is also too much confidence placed in unfiltered surface supplies from inhabited watersheds. Even where there is alleged control of the watershed and ample storage, pollution may occur. In regard to unfiltered surface supplies the need of bacteriologic control is very evident. Dangerous pollution may be present only for a few days or for a few hours. This is most likely to be disastrous in time of drought or low water. At such times the diluting effect of the inflow and the purifying effect of storage are both reduced to the minimum. The bacterial count per cubic centimeter is valuable, but the quantitative estimation of B. coli is of far greater importance. A low count does not necessarily imply a safe water, but a low count, coupled with absence of B. coli, may be considered an index of safety.

The typhoid epidemic in Baltimore [1] in 1910 was coincident with a prolonged drought. The run-off from the watershed of the Gunpowder River was reduced to the minimum. The sewage pollution was thus concentrated and gross pollution was evident upon bacteriologic examination. B. coli was frequently found in 0.1 of a cubic centimeter, and sometimes in 0.01 cubic centimeter samples. When

[1] Ford, Wm. W., and Watson, E. M. Bulletin Johns Hopkins Hospital, October, 1911.

the run-off increased, affording greater dilution and increased storage, the water returned to normal and the typhoid fever dropped to a minimum.

In Europe surface supplies are almost invariably filtered, and eventually such supplies in America will be treated or filtered.

Poor filter efficiency is often responsible for disaster in the shape of typhoid outbreaks and may be due to several causes. The slow sand type may give poor filter efficiency when sufficient extra units are lacking, necessitating excessive rates and placing of "green" filters in service. Excessive rates, too little coagulant, insufficient sedimentation capacity, and insufficient storage are common operating and structural faults of the mechanical type. Sometimes a properly constructed plant is struggling with a raw water which has a high bacterial content and even with fair filter efficiency yields an unsafe effluent. Probably the greatest single cause of a poor effluent from filter plants is inefficient operation by unskilled men. It is absolutely essential for good results that bacteriologic examination, including B. coli estimation, be made at least once daily, and in slow sand plants from each unit separately.

The man in charge must be able to do this. In mechanical filter plants or with hypochlorite plants he must also have the necessary skill to adjust his chemicals with nicety according to the changes in the raw water. With such a man in charge of a properly constructed plant a safe effluent is assured at all times. When struggling with a bad raw water, he will use hypochlorite as an adjuvant with good results. He will study the peculiarities and fluctuations of the constituents of the raw water and adjust his treatment accordingly.

The most serious defect in sanitary control of our water supplies is the lack of proper daily bacteriologic examination of the water and quantitative estimation of the B. coli content. In some of the lake cities there is proper daily bacteriologic examination of the water supply, but in many of them there is either an imperfect examination or none at all. One city with a slow sand filter plant of three units and a consumption equal to the safe filter capacity of the beds operates these without rest, putting the units in service "green" and with an occasional examination of the water once or twice a month. As a result this city in 1910 had a typhoid-fever death rate of over 300 per 100,000. One large city using unfiltered lake water is so sure that the water is pure that examination is made only occasionally. One of the largest lake cities using an unfiltered supply exposed to sewage pollution makes a bacterial count daily, but restricts its effort to detect sewage pollution to the antiquated and indefinite test of inoculating a guinea pig occasionally with a small portion of a broth culture.

It is the plain duty of a municipality to provide its citizens with pure water. It is not sufficient to warn against a supply as dangerous and advise its use only for fire, lawn sprinkling, or factory purposes, as at Flint or Saginaw. There are many people in every city who are like children and must be protected even against themselves. The lazy, poor, and ignorant will drink and use the polluted public supply from a convenient tap rather than travel a considerable distance to a pump or buy bottled water which they can ill afford. Neither is it sufficient to have a safe supply for 360 days out of the year, warning the people to boil the water on the other 5 days. The notice to boil

the water is based on bacteriologic findings which are 24 hours late. The notice is often ineffective, and by some ignored.

The factors affecting sewage pollution of a water supply and which determine the relative danger to be anticipated from such pollution are: The amount of polluting material, the presence of pathogenic organisms, the time of transit from the source of pollution to the waterworks intake, and the amount of water available for dilution.

Provided that the amount of polluting material is considerable, that typhoid fever is prevalent on the watershed, and that the time of transit is within the bounds of time deemed necessary for the natural death of bacteria, pollution of the intake will take place. The last factor, the amount of dilution, will determine the intensity of the pollution. If the polluting material is great in amount or if a swift current cuts down the time of transit, prevents sedimentation, and retards dilution, then gross pollution results.

With a dilute pollution one need not expect a great explosive outbreak, but many cases of typhoid may result, especially following floods and rains. Often in the absence of explosive outbreaks in the winter or spring months it will be demonstrable that too many deaths from typhoid fever occur in the first half of the year. On the other hand, it is reasonable to suppose that the dilute infection may be responsible for many scattered cases which can not be traced to water. These cases may not appear in sufficient numbers in any particular month to be remarkable or they may be obscured by occurring in the months when typhoid fever is accepted as an inevitable visitation.

Water may be responsible for many cases of typhoid when it is impossible to prove the case against it. We are able to fix the guilt on the water supply only in massive outbreaks of explosive character, but smaller doses of pollution can be responsible for smaller outbreaks of many cases spaced over a long period without any hope of proving this causation.

When cities have a public water supply polluted by sewage, or admittedly exposed to pollution, the obvious thing to do is to filter or treat the water and protect the public from infection. Unfortunately there is a deplorable tendency to abuse the town above and to spend years in an effort to compel (usually without legal process) sewage treatment in the offending municipality. In other cities where the pollution is due to their own sewage, years are lost in the discussion of methods of sewage purification, while the dangerous untreated and unfiltered water is furnished to the citizens.

In regard to sewage disposal it must be remembered that no general rule can be formulated which will cover with justice every case. Each municipality becomes a separate problem and local conditions must be studied. Remedies for correction of improper sewage disposal will differ according to the local conditions. Even if all the sewage from our large cities and towns was prevented from reaching the lakes and rivers, it would be impossible to prevent pollution from reaching these waterways in times of storm and flood, so that sewage disposal even carried to the degree of sterilizing the effluent does not give us a substitute for water filtration or treatment. While it is impracticable to prevent pollution of the Great Lakes, it is possible and imperatively necessary that such pollution be controlled and kept within safe bounds. It would be very foolish from an economic

standpoint not to avail ourselves of the cheapest and simplest method of sewage disposal, viz, disposal by dilution, provided that this may be done without danger to the water supplies of other communities and without putting an unreasonable burden and excessive responsibility upon the filter plants of those communities. The point to which this method of disposal may be permitted must be determined by local conditions. There is a crying need in the United States for official standards of drinking water.

In view of the fact that bacterial counts may be low in a comparatively dangerous water, and sometimes a high count might be found in water containing no evidence of fecal bacteria, the colon estimation is of primary importance in judging the character of a raw water. There should be standards for the permissible colon content of raw water. These should be fixed after careful study of the ability of filter plants and other processes to remove colon and other fecal bacteria. These standards for raw water and for filtered or treated water would enable us to strike a balance between sewage purification and treatment of water, and to determine the degree of sewage purification necessary to assure a raw water of reasonable quality at a given point. These standards would also mark the extent to which disposal of sewage by simple dilution might be permitted with safety. As a general proposition, it is cheaper to treat drinking water than to purify sewage. The economic side of the question must be considered. How far is it necessary to carry the treatment of sewage as an adjunct to water purifications? The balance between these two powerful agencies in the protection of the public health must be struck, and, as intimated above, this must be done separately for each local problem and no definite rule for the relation of these agencies can be made. These should fix the permissible number of bacteria in both raw and filtered or treated water. I do not care to attempt to fix such a standard, but, in my opinion, the bacterial count in raw water from the Great Lakes should not exceed 5,000 per cubic centimeter at any time and should not average above 1,000. Filtered or treated water should not contain more than 100 organisms per cubic centimeter at any time and the average should be 20 or under.

These sewage problems are often difficult of solution, present great engineering difficulties, and necessitate the expenditure of large sums of money. This means that much time must elapse before the proper method is selected and a great deal more time will pass before the works are completed. In the end though necessary, the sewage purification does not remove all pollution, and treatment of the water supply is still a necessity after the sewage-disposal plant is in operation. On the other hand, the dangerous public water supply is a simpler proposition. Immediate protection can be afforded by treating with "hypochlorite," using a temporary plant until the method to be finally adopted is decided upon. In a word, there is every excuse for deliberation and reasonable delay in settling the sewage-disposal problems, while there is no excuse whatever for any municipal government to delay in applying the remedy which protects immediately, viz, treatment or filtration of the public water supply. Sewage-disposal measures for improving the quality of the raw water, for preventing its deterioration, or for other reasons may be undertaken when necessary and feasible.

SUMMARY.

1. In the prevention of typhoid fever there is a necessity for safe water supplies for 365 days in the year.
2. Unfiltered surface supplies may be exposed to a dangerous pollution for a few days or even for a few hours only.
3. Supplies derived by impounding surface waters and which depend upon storage alone to nullify the pollution of an inhabited watershed may be very dangerous in periods of drought and low water. The proportion of pollution is relatively greater at such times and the time of storage is greatly reduced.
4. Purification, whether by storage, filtration, or chemical treatment, must be efficient at all times, and this can not be assured without daily bacteriologic control.
5. It is essential that a daily quantitative estimation of B. coli be made, as a low bacterial count does not necessarily mean a safe water without absence of B. coli.
6. There is a necessity for close supervision of municipal plants by the State to correct structural and operative defects and insure a safe water at all times.
7. Bacteriologic control and State supervision would insure cleaning when necessary and should prevent the putting in service of slow sand filters before the *Schmutzdecke* is ripe.
8. In order to control typhoid fever and eliminate water-borne typhoid it is not sufficient alone to have a purification plant. In addition the purification must be efficient and the purified water must be available in all parts of the city.
9. The danger of dual water supplies is apparent, especially if the polluted supply is easy of access and the safe supply difficult to reach or expensive.
10. In protecting the public health, purification of the public water supply is usually primary and sewage disposal secondary, but often a judicious adjustment of the two agencies is necessary especially for economic reasons. Sewage disposal will rarely if ever make a sewage-polluted water supply absolutely safe, but is often an aid and sometimes a necessity to furnishing a reasonably good raw water for the purification plant.

A "PUBLIC-HEALTH WEEK" IN BALTIMORE.

Under the auspicies of the Medical and Chirurgical Faculty of Maryland there was observed from February 19 to 26 a "public-health week," which included an exhibition and lectures daily on public-health subjects.

Several lectures were presented each evening to popular audiences assembled in the lecture room of the building of the above-mentioned faculty, and space was provided in the same building for housing the exhibit.

On request, the Public Health and Marine-Hospital Service sent exhibits, which included a number of models used in previous exhibits and certain charts and maps. The models were as follows:

1. Corner of rat-infested kitchen, with insanitary garbage barrel.
2. House and surroundings, showing rat infestation.

3. House and barn, showing antirat devices.
4. House screened against yellow fever.
5. California ground squirrels and their natural enemies (wolf, coyote, hawk, eagle, snake).
6. Quarantine machinery.
7. Models of privies, sanitary and insanitary, including a full-sized L. R. S. privy.

Other materials in the service exhibit were as follows:

1. Outline drawings showing the antiplague work in San Francisco, 1907–1909.
2. Drawings showing the work against yellow fever in New Orleans, 1905.
3. Colored drawings and halftone prints illustrating pellagra.
4. A large map of the United States, showing the field investigations of the service during 1911.
5. A "hookworm and privy chart," taken apart and with each leaf displayed.
6. Charts illustrating the prevalence of smallpox in the United States.
7. Charts showing the work of the Division of Pharmacology on drug standardization, etc.
8. Boards carrying copies of available service literature, firmly fastened.
9. Charts showing the work of the service on typhoid fever.
10. Colored drawings illustrating trachoma.
11. Chart illustrating recent researches on typhus fever.
12. Chart and specimens showing Hygienic Laboratory work on embalming fluids.
13. Companion maps showing the results of the cholera invasions of 1873 and 1911.

In addition to the above, there were miscellaneous photographs and colored drawings and prepared specimens illustrating the activities of the service in relation to the investigation of leprosy, plague, rabies, tuberculosis, animal parasites, etc.

Valuable exhibits were made by the health authorities of the State of Maryland and the city of Baltimore, all of the materials being arranged generally to demonstrate the causes of diseases, the symptoms produced thereby, the methods of transmission, and the measures necessary for their prevention.

The value to a community of the holding of a general exhibition on hygiene and sanitation was well exemplified, and the plan of observing a public health week as inaugurated by the Medical and Chirurgical Faculty of Maryland might well be adopted by the medical profession in other States and cities.

SALVARSAN IN FRAMBŒSIA TROPICA (YAWS).

Consul Franklin D. Hale at Trinidad, British West Indies, states that in a recent report made to the governor and legislative council by the surgeon general special mention was made of the use of salvarsan at the St. Augustine hospital where from January to October, 1911, 500 cases of frambœsia tropica were treated with salvarsan in

doses of 9 grains for an adult as an intramuscular injection, with the following results: 498 cases, or 99$\frac{6}{10}$ per cent were cured. Of these 409 cases, or 82 per cent were cured with one treatment; 75 cases required the second injection, while 14 had to be treated the third time. At the time of the submitting of the report there were only two stubborn cases, but these were subsequently reported as cured. There were only five relapses after the treatment, or 1 per cent, whereas before the use of salvarsan was commenced, the number of relapses after treatment was 12 or 14 per cent. No local gangrene, no nerve or ear complications, and no dimness of sight resulted from the use of the salvarsan.

UNITED STATES.

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

[Adopted since July 1, 1911.]

NEW YORK, N. Y.

MILK—PRODUCTION, CARE, AND SALE—WITH SPECIAL REFERENCE TO PASTEURIZATION.

Amendment to Sanitary Code.

SECTION 56a. All milk held, kept, offered for sale or sold and delivered in the city of New York shall be so held, kept, offered for sale or sold and delivered under either or any of the following grades or designations, and under no other, and in accordance with such rules and regulations as may be adopted by the board of health, namely:

Grade A (for infants and children).—1. Certified or guaranteed milk. 2. Inspected milk (raw). 3. Selected milk (pasteurized).

Grade B (for adults).—1. Selected milk (raw). 2. Pasteurized milk.

Grade C (for cooking and manufacturing purposes only).—Raw milk not conforming to the requirements for grade A and B. Condensed skimmed milk. Condensed or concentrated milk.

The provisions of this section shall not apply to buttermilk or to milk products commonly known as kumyss, matzoon, zoolak, dried milk or milk powder, or to other similar preparations, or to cream or modified milk.

SEC. 56c. No milk shall be held, kept, offered for sale or sold and delivered in the city of New York under either or any of the designations known as grade A, B, or C, or any of the subdivisions thereof, or any of the designations "condensed skimmed milk," "condensed or concentrated milk," or "modified milk," without special permit in writing therefor from the board of health, subject to the conditions thereof.

The special permit shall specify the grade or subdivision thereof or the special designation of milk which the holder of such permit is authorized to keep for sale or offer for sale, as aforesaid.

None of the provisions thereof, however, shall apply to condensed milk when contained in hermetically sealed cans.

[Amendment to Sanitary Code adopted Jan. 4, 1912.]

Regulations.

GRADE A (FOR INFANTS AND CHILDREN).

GUARANTEED MILK.

Definition.—Guaranteed milk is milk produced at farms holding permits therefor from the board of health and produced and handled in accordance with the following minimum requirements, rules, and regulations:

Requirements, rules, and regulations.—1. Only such cows shall be admitted to the herd as have not reacted to a diagnostic injection of tuberculin.

2. All cows shall be annually tested with tuberculin, and all reacting animals shall be excluded from the herd.

3. No milk from reacting animals shall be shipped to the city of New York for any purpose whatever.

4. The milk shall not contain more than 30,000 bacteria per cubic centimeter when delivered to the consumer or at any time prior to such delivery.

5. The milk shall be delivered to the consumer only in sealed bottles which have been sealed at the dairy and shall be labeled with the day of the week upon which the earliest milking, of which the contents of the bottle form part, has been drawn.
6. The milk shall be delivered to the consumer within 30 hours of the time at which it was drawn.

CERTIFIED MILK.

Definition.—Certified milk is milk certified by a milk commission appointed by the Medical Society of the County of New York or the Medical Society of the County of Kings as being produced under the supervision and in conformity with the requirements of that commission as laid down for certified milk and sold under a permit therefor issued by the board of health.
No milk shall be held, kept, offered for sale, or sold and delivered as certified milk in the city of New York which is produced under requirements less than those for "guaranteed milk."

INSPECTED MILK (RAW).

Definition.—Inspected milk (raw) is milk produced at farms holding permits therefor from the board of health and produced and handled in accordance with the following minimum requirements, rules, and regulations:
Requirements, rules, and regulations.—1. Only such cows shall be admitted to the herd as have not reacted to a diagnostic injection of tuberculin.
2. All cows shall be tested annually with tuberculin, and all reacting animals shall be excluded from the herd.
3. No milk from reacting animals shall be shipped to the city of New York for any purpose whatsoever.
4. The farms at which the milk is produced must obtain at least 75 points in an official score of the department of health. These 75 points shall be made up as follows: A minimum of 32 points for equipment and 43 points for method.
5. The milk shall not contain more than an average of 60,000 bacteria per cubic centimeter when delivered to the consumer or at any time prior thereto.
6. Unless otherwise specified in the permit, the milk shall be delivered to the consumer only in bottles.

SELECTED MILK (PASTEURIZED).

Definition.—Selected milk (pasteurized) is milk produced at farms holding permits therefor from the board of health and produced and handled in accordance with the following requirements, rules, and regulations:
Requirements, rules, and regulations.—1. The farms at which the milk is produced must obtain at least 60 points in an official score of the department of health. Of these 60 points, a minimum of 20 points shall be required for equipment and a minimum of 40 points for method.
2. All milk of this grade shall be pasteurized, and said pasteurization shall be carried on under a special permit issued therefor by the board of health, in addition to the permit for "selected milk (pasteurized)."
3. The milk shall not contain more than an average of 50,000 bacteria per cubic centimeter when delivered to the consumer or at any time after pasteurization and prior to such delivery.
4. Unless otherwise specified in the permit, the milk shall be delivered to the consumer only in bottles.
5. All containers in which pasteurized milk is delivered to the consumer shall be plainly labeled "pasteurized." Labels must also bear the date and hour when pasteurization was completed, the place where pasteurization was performed, and the name of the person, firm, or corporation performing the pasteurization.
6. The milk must be delivered to the consumers within 30 hours after the completion of the process of pasteurization.
7. No milk shall be pasteurized more than once.
8. No milk containing in excess of 200,000 bacteria per cubic centimeter shall be pasteurized.
General regulations for grade A.—1. The caps of all bottles containing milk of grade A shall be white, and shall contain the words "Grade A" in black letters, in large type.
2. If cans are used for the delivery of milk of grade A, the said cans shall have affixed to them white tags with the words "Grade A" printed thereon in black letters, in large type, together with the designation "Inspected milk (raw)" or "Selected milk (pasteurized)," as the quality of the contents may require.

GRADE B (FOR ADULTS).

SELECTED MILK (RAW).

Definition.—Selected milk (raw) is milk produced at farms holding permits therefor from the board of health, and produced and handled in accordance with the following minimum requirements, rules, and regulations:

Requirements, rules, and regulations.—1. Only such cows shall be admitted to the herd as have been physically examined by a regularly qualified veterinarian and declared by him to be healthy and free from tuberculosis in so far as a physical examination may determine that fact.

2. The farms at which the milk is produced must obtain at least 68 points in an official score of the department of health. These 68 points shall be made up as follows: A minimum of 25 points for equipment, and a minimum of 43 points for method.

3. The milk shall not contain an excessive number of bacteria when delivered to the consumer, or at any time prior thereto.

PASTEURIZED MILK.

Definition.—Pasteurized milk (grade B) is milk produced under a permit issued therefor by the board of health, and produced and handled in accordance with the following minimum requirements, rules, and regulations and in further accordance with the special rules and regulations relating to the pasteurization of milk.

Requirements, rules, and regulations.—1. The milk after pasteurization must be at once cooled and placed in sterilized containers, and the containers immediately closed.

2. All containers in which pasteurized milk is delivered to the consumer shall be plainly labeled "pasteurized." Labels must also bear the date and hour when the pasteurization was completed, the place where pasteurization was performed, and the name of the person, firm, or corporation performing the pasteurization.

3. The milk must be delivered to the consumer within 36 hours after the completion of the process of pasteurization.

4. No milk shall be pasteurized more than once.

5. No milk containing an excessive number of bacteria shall be pasteurized.

General regulations for grade B.—1. Caps of bottles containing milk of grade B shall be white and marked "Grade B" in bright green letters, in large type.

2. The necks and shoulders of cans containing milk of grade B shall be painted bright green, and a metal tag shall be affixed to each can with the words "Grade B" in large type, and the words of the subdivision to which the quality of the milk in the said can conforms.

GRADE C (FOR COOKING AND MANUFACTURING PURPOSES ONLY).

Definition.—Raw milk not conforming to the requirements of any of the subdivisions of grade A or grade B.

Requirements, rules, and regulations.—1. Milk of this grade shall not be sold at retail from stores.

2. Milk of this grade may be sold to restaurants, hotels, and manufacturing plants only.

3. Cans containing milk of grade C shall be painted red on necks and shoulders, and shall be provided with a metal tag containing the words "Grade C" in large type. All creameries handling milk of different grades will be required to demonstrate to the department of health that they are capable of keeping the grades separate, and must keep records satisfactory to the department of health concerning the amount of milk of each grade handled each day.

CONDENSED OR CONCENTRATED MILK.

Definition.—This is milk of any grade or subdivision thereof from which any part of the water has been removed, or from which any part of the water has been removed and to which sugar had been added.

Rules and regulations.—Milk of this designation shall be sold only under a permit issued therefor.

GENERAL RULES AND REGULATIONS.

1. *Permits.*—A permit for the sale of milk or cream, of any grade or designation, may be granted only after an application has been made in writing on the special blank provided for the purpose.

2. A permit for the sale of milk, of any grade or designation, or of cream, may be granted only after the premises where it is proposed to care for and handle such milk shall have been rendered clean and sanitary.

3. Every permit for the sale of milk or cream from places other than wagons shall expire one year from the date of issue.

4. No wagon shall be used for the transportation of milk, condensed milk, or cream without a permit from the board of health. Every such permit shall expire on the last day of December of the year in which it is granted. A wagon permit for the sale or transportation of milk, condensed milk, or cream shall be conspicuously displayed on the outside of the wagon so that it may be readily seen from the street.

5. Every permit for the sale of milk, of any grade or designation, in a store shall be so conspicuously placed that it may be readily seen at all times.

6. All stores selling or keeping for sale milk, condensed milk, or cream will be frequently inspected and scored by a system adopted by the department of health, and the revocation of the permit of any store may ensue if the score is found repeatedly below the required standard.

7. The revocation of a permit may ensue for violation of any of the rates and regulations of the department of health.

8. The revocation of a permit may ensue upon repeated conviction of the holder thereof of the violation of any section of the Sanitary Code relating to the adulteration of milk of any grade or designation.

1. *Sanitary requirements.*—Milk, condensed milk, or cream shall not be kept for sale nor stored in any stable or room used for sleeping or domestic purposes, or in any room if in communication with such stable or room, or with water-closet apartments, except when such water-closet apartments are inclosed by a vestibule and are properly ventilated to the external air.

2. Milk, condensed milk, or cream shall not be sold or stored in any room which is dark, poorly ventilated, or dirty, or in which rubbish or useless material is allowed to accumulate, or in which there are offensive odors.

3. The vessels which contain milk, condensed milk, or cream, while on sale, must be so protected by suitable covers and so placed in the store that the milk, condensed milk, or cream will not become contaminated by dust, dirt, or flies.

4. Cans containing milk, condensed milk, or cream shall not be allowed to stand on the sidewalk or outside of the store door.

5. Milk, condensed milk, or cream must not be transferred from cans to bottles or other vessels on the streets, at ferries, or at railroad depots, except when transferred to the vessel of the purchaser at the time of delivery.

6. Cans in which milk, condensed milk, or cream is kept for sale, shall be kept either in a milk tub, properly iced, or in a clean ice box or refrigerator in which these or similar articles of food are stored.

7. All containers in which milk, condensed milk, or cream is handled, transported, or sold, must be thoroughly cleaned and sterilized before filling, but such cleaning shall not be done nor shall such containers be filled in any stable or in any room used for sleeping or domestic purposes, or in any room having connection with such stable or rooms, or with water-closet apartments, except when such water-closet apartments are inclosed by a vestibule and are properly ventilated to the external air.

8. All dippers, measures, or other utensils used in the handling of milk, condensed milk, or cream must be kept clean while in use, and must be thoroughly cleaned with hot water and soapsuds directly after each day's use.

9. The ice box or ice tub in which milk, condensed milk, or cream is kept must be maintained in a thoroughly clean condition and must be scrubbed at such times as may be directed by the department of health.

10. The overflow pipe from the ice box in which milk, condensed milk, or cream is kept must not be directly connected with the drainpipe or sewer, but must discharge into a properly trapped, sewer-connected, water-supplied open sink.

11. No person having a contagious disease, or caring for or coming in contact with any person having a contagious disease, shall handle milk.

Labeling.—Each container or receptacle used for bringing milk or cream into the city of New York, from which the said milk or cream is sold directly to the consumer, shall bear a tag stating, if shipped from a creamery, the location of the said creamery and the date of shipment; if shipped directly from a dairy, the location of the said dairy and the date of shipment.

As soon as the contents of such container or receptacle are sold, or before the said container is returned or otherwise disposed of, or leaves the possession of the dealer, the tag thereon shall be removed and kept on file in the store where such milk or cream has been sold for a period of two months thereafter for inspection by the department of health.

Every wholesale dealer in the city of New York shall keep a record in his main office in the said city which shall show the place or places from which milk or cream delivered by him daily to retail stores in the city of New York has been received, and the said record shall be kept for a period of two months for inspection by the department of health and shall be readily accessible to the inspectors of the said department.

1. *Pasteurization.*—Milk which has been subjected to the action of heat commonly known as "pasteurization" shall not be held, kept, offered for sale, or sold and delivered in the city of New York unless the receptacle in which the same is contained is plainly labeled "pasteurized."

2. Only such milk or cream shall be regarded as pasteurized as has been subjected to a process in which the temperature and exposure conform to one of the following:

No less than 158° F. for at least 3 minutes.
No less than 155° F. for at least 5 minutes.
No less than 152° F. for at least 10 minutes.
No less than 148° F. for at least 15 minutes.
No less than 145° F. for at least 18 minutes.
No less than 140° F. for at least 20 minutes.

3. The said term "pasteurized" shall only be used in connection with the milk classified as "grade A, selected milk (pasteurized)" and "grade B, pasteurized," or cream obtained from such milk.

4. Milk or cream which has been heated in any degree will not be permitted to be sold in New York City unless the heating conforms with the requirements of the department of health for the pasteurization of milk or cream.

5. Applications for permits to pasteurize milk or cream will not be received until all forms of apparatus connected with the said pasteurization have been tested and the processes approved by the board of health.

[Regulations, department of health, adopted Jan. 4, 1912.]

The following is taken from the discussion of the considerations which influenced the department of health in making the above amendments to the sanitary code and milk regulations as it appeared in the January, 1912, bulletin of the New York City department of health:

Why Pasteurization Is Necessary.

In any discussion of pasteurization, as used in connection with modern and approved methods of municipal control, it is hardly necessary to state that the term refers to thorough and efficient heating, under careful supervision by the public health authorities, in accordance with regulations based on the results of scientific research as to the temperatures and duration of exposure thereto, necessary to destroy disease-producing bacteria.

During the past three years the course of events has furnished striking proof of the need of such pasteurization of all except special grades of milk. By means of a well-organized system of inspection, based on the issue of permits to ship and sell milk in New York City, the department is in a position to trace the history and source of all milk brought into the city, and is thereby enabled to undertake satisfactory detective work in determining the causes of given outbreaks of infectious diseases due to contaminated milk. Studies carried out in this manner have proved beyond reasonable doubt that since August, 1909, at least two extensive outbreaks of typhoid fever in the city were caused by the infection of particular milk supplies from chronic bacillus carriers. In the case of one outbreak traced to Camden, N. Y., the infection came from a dairyman who had had typhoid fever in Wisconsin in 1863. The subsequent history of his family shows that the disease had attacked nearly every member of his household, including farm laborers who had worked with him from time to time. Bacteriological examinations in 1909, 46 years after he had had the disease, resulted in the development of almost pure cultures of typhoid-fever bacilli.

Danger from "Typhoid Carriers."

The necessity of extraordinary precautions on the part of a municipality to guard its milk against such danger is self-evident. Typhoid-bacillus carriers are not the rare phenomena they were formerly supposed to be, and the presence of even one of these unfortunate persons in the great army of workers engaged in producing and handling the milk supply of a large city is a source of danger which is the more threatening and insidious because it is so impossible to detect by ordinary means. To insure the safety of milk from such infection would require repeated bacteriological examinations of every individual connected with the production, transportation, and marketing of the milk. There are, perhaps, 300,000 persons who stand in this relation to the milk supply of New York City, and a recent estimate of the relative frequency of bacillus carriers gives reason for the belief that there are at least 100 such individuals among this number. No matter how many inspectors of dairies, creameries, and stores the department might employ, no matter how perfectly organized the system of permits and information as to the source of milk, these forces alone can not protect the health of the city.

CEREBROSPINAL MENINGITIS.

TEXAS.

Surg. Guiteras reports the occurrence at Galveston of 13 cases of cerebrospinal meningitis with 3 deaths during the period from March 5 to 12, 1912.

Acting Asst. Surg. Fairbanks, at Brownsville, reports March 9 the presence of a case of cerebrospinal meningitis at Harlingen, Cameron County, Tex.

At Houston the health officer reports 21 cases with 9 deaths during the two weeks ended March 9, 1912.

At San Antonio the health officer reports the occurrence of 1 case during the week ended March 2, 1912.

OKLAHOMA.

From the time the first case was reported in December, 1911, to February 28, 1912, there have been reported cerebrospinal meningitis cases and deaths in the following counties of Oklahoma:[1]

County.	Cases.	Deaths.	County.	Cases.	Deaths.
Custer	2	1	Hughes	15	12
Kiowa	2	.....	Jackson	1	1
Garvin	4	3	Stephens	1	.....
Bryan	50	20	Seminole	4	2
Carter	10	4	Garfield	4	3
Love	20	7	Beaver	1	.....
Marshall	24	7	Haskell	1	1
McLain	7	3	Le Flore	1	.....
Comanche	10	3	Washington	1	1
Johnston	22	7	Pottawatomie	5	1
McCurtain	18	10	Creek	3	.....
Murray	2	1	Woods	1	.....
Osage	11	5	Tulsa	2	2
Choctaw	6	4	Grant	1	.....
Pontotoc	25	10	Wagoner	2	1
Pawnee	3	1	Coal	1	.....
Harmon	3	2	Okmulgee	1	.....
Muskogee	6	3	McIntosh	7	5
Pushmataha	3	1			
Atoka	1	.....	Total	282	121
Grady	1	.....			

PLAGUE-PREVENTION WORK.

DISTRIBUTION OF POISON.

In connection with the making and maintenance of a squirrel-free zone around the cities of California on San Francisco Bay, 1,485 acres of land in Alameda County were covered with poison during the week ended March 2, 1912.

[1] Bulletin of the Oklahoma State board of health March 1912.

During the same period 1,760 acres of land in San Joaquin County and 3,245 acres in Stanislaus County were covered with poison for the purpose of eradicating plague foci.

RECORD OF PLAGUE INFECTION.

Places.	Date of last case of human plague.	Date of last case of rat plague.	Date of last case of squirrel plague.	Total number of rodents found infected since May, 1907.
California:				
Cities—				
San Francisco	Jan. 30, 1908	Oct. 23, 1908	None	398 rats.
Oakland	Aug. 9, 1911	Dec. 1, 1908	do	126 rats.
Berkeley	Aug. 27, 1907	None	do	None.
Los Angeles	Aug. 11, 1908	do	Aug. 21, 1908	1 squirrel.
Counties—				
Alameda (exclusive of Oakland and Berkeley).	Sept. 26, 1909	Wood rat, Oct. 17, 1909.	Oct. 9, 1911	114 squirrels and 1 wood rat.
Contra Costa	July 21, 1911	None	Sept. 23, 1911	364 squirrels.
Fresno	None	do	Oct. 27, 1911	1 squirrel.
Merced	do	do	July 13, 1911	5 squirrels.
Monterey	do	do	Aug. 6, 1911	Do.
San Benito	June 5, 1910	do	June 8, 1911	22 squirrels.
San Joaquin	Sept. 18, 1911	do	Aug. 26, 1911	18 squirrels.
San Luis Obispo	None	do	Jan. 29, 1910	1 squirrel.
Santa Clara	Aug. 23, 1910	do	Oct. 5, 1910	23 squirrels.
Santa Cruz	None	do	May 17, 1910	3 squirrels.
Stanislaus	do	do	June 2, 1911	13 squirrels.
Washington:				
City—				
Seattle	Oct. 30, 1907	Sept. 21, 1911	None	25 rats.

RATS COLLECTED AND EXAMINED FOR PLAGUE INFECTION.

Places.	Week ended—	Found dead.	Total collected.	Examined.	Found infected.
California:					
Cities—					
Berkeley	Mar. 2, 1912	2	[1] 160	76	.....
Oakland	do	24	[2] 637	437	.....
San Francisco	do	11	[3] 1,637	1,200	.....
Counties—					
San Joaquin	do	.....	[4] 77	77	.....
Washington:					
City—					
Seattle	do	.....	993	948	.....

[1] Identified: Mus norvegicus, 79; Mus rattus, 1; Mus musculus, 80.
[2] Identified: Mus norvegicus, 482; Mus rattus, 2; Mus musculus, 152; Mus alexandrinus, 1.
[3] Identified: Mus norvegicus, 761; Mus rattus, 200; Mus musculus, 441; Mus alexandrinus, 235.
[4] Identified: Mus norvegicus, 76; Mus musculus, 1.

SMALLPOX IN THE UNITED STATES.

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

SMALLPOX IN THE UNITED STATES—Continued.

REPORTS RECEIVED DURING WEEK ENDED MAR. 22, 1912.

Places.	Date.	Cases.	Deaths.	Remarks.
Florida:				
Counties—				
Alachua	Feb. 25–Mar. 2	4		
De Soto	do	4		
Duval	do	34		
Madison	do	1		
Manatee	do	1		
Pasco	do	1		
Polk	do	1		
Putnam	do	17		
Volusia	do	5		
Total for State		68		
Illinois:				
Counties—				
Bond	Jan. 1–31	5		
Bureau	do	2		
Champaign	do	1		
Christian	do	3		
Clinton	do	1		
Cook	do	1		
Douglas	do	16		
Kane	do	9		
Lasalle	do	24		
Macon	do	1		
Madison	do	1		
Ogle	do	1		
Platt	do	2		
Putnam	do	1		
Rock Island	do	3		
St. Clair	do	2		
Sangamon	do	5		
Shelby	do	21		
Stephenson	do	5		
Whiteside	do	4		
Total for State		108		
*Louisiana:				
New Orleans	Mar. 3–9	16		
Michigan:				
Counties—				
Chippewa	Feb. 1–29	1		
Clinton	do	2		
Crawford	do	1		
Eaton	do	1		
Genesee	do	3		
Hillsdale	do	3		
Ingham	do	1		
Ionia	do	4		
Jackson	do	10		
Kalamazoo	do	8		
Kalkaska	do	3		
Lenawee	do	1		
Monroe	do	5		
Oceana	do	11		
St. Clair	do	5		
St. Joseph	do	1		
Shiawassee	do	4		
Tuscola	do	1		
Wayne	do	15		
Total for State		80		
North Dakota:				
Counties—				
Bottineau	Feb. 1–29	2		
Grand Forks	do	6		
La Moure	do	7		
McHenry	do	35		
Renville	do	1		
Walsh	do	8		
Total for State		59		

SMALLPOX IN THE UNITED STATES—Continued.

Reports Received during week ended Mar. 22, 1912.

Place.	Date.	Cases.	Deaths.	Remarks.
*Tennessee:				
Chattanooga	Mar. 3-9	1		
Knoxville	do	2		
Total		3		
Vermont:				
Counties—				
Caledonia	Feb. 1-29	19		
Chittenden	do	2		
Essex	do	3		
Lamoille	do	1		
Washington	do	3		
Total or State		28		
Grand total for the United States.		362		

For reports received from July 1 to December 29, see Public Health Reports for December 29, 1911. The cumulative table of reported cases of smallpox, heretofore published each week, has been discontinued, and in its place summaries will be published periodically.

MORBIDITY AND MORTALITY.

MORBIDITY AND MORTALITY TABLE, CITIES OF THE UNITED STATES, FOR WEEK ENDED MAR. 2, 1912.

Cities.	Population, United States census, 1910.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Smallpox.		Tuberculosis.		Typhoid fever.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cities having over 500,000 inhabitants.														
Baltimore, Md.	558,485	257	26	....	16	....	25	....	....	....	41	41	13	1
Boston, Mass.	670,585	272	36	2	204	1	30	....	....	....	85	33	1	1
Chicago, Ill.	2,185,283	726	124	22	99	2	175	14	....	....	195	83	17	2
Cleveland, Ohio.	560,663	156	19	1	57	....	34	2	....	....	35	16	2	....
New York, N. Y.	4,766,883	1,546	322	32	1,269	24	419	17	2	....	598	203	34	5
Philadelphia, Pa.	1,549,008	502	83	12	16	2	70	2	....	....	103	43	20	5
Pittsburgh, Pa.	533,905	158	19	3	15	....	23	....	....	....	26	11	6	....
St. Louis, Mo.	687,029	248	41	2	26	....	29	1	5	....	48	17	2	....
Cities having from 300,000 to 500,000 inhabitants.														
Cincinnati, Ohio.	364,463	132	6	....	4	....	31	3	....	....	38	18	1	....
Detroit, Mich.	465,766	179	19	2	....	....	20	1	9	....	....	....	....	....
Los Angeles, Cal.	319,198	117	12	1	1	....	11	....	2	....	24	18	5	....
Milwaukee, Wis.	373,857	102	14	1	51	....	30	1	....	....	11	12	40	3
Newark, N. J.	347,469	89	30	1	....	1	23	....	....	....	15	11	4	1
New Orleans, La.	339,075	172	2	....	2	....	12	1	8	....	40	22	3	....
San Francisco, Cal.	416,912	158	13	1	263	5	6	....	1	....	22	23	6	1
Washington, D. C.	331,069	137	5	....	11	....	9	....	....	....	21	18	3	....
Cities having from 200,000 to 300,000 inhabitants.														
Denver, Colo.	213,381	79	8	....	3	....	5	....	....	....	....	15	....	....
Jersey City, N. J.	267,779	72	....	1	....	....	....	....	....	....	....	14	....	....
Providence, R. I.	224,326	80	13	1	30	1	10	....	....	....	10	5	2	....
Seattle, Wash.	237,194	49	3	....	10	....	1	....	1	....	7	5	7	1
Cities having from 100,000 to 200,000 inhabitants.														
Bridgeport, Conn.	102,054	30	2	....	6	....	8	2	....	....	2	1	....	....
Cambridge, Mass.	104,839	35	....	....	3	....	4	....	....	....	9	4	2	....
Columbus, Ohio.	181,548	50	11	....	74	1	11	....	....	....	18	6	3	....

MORBIDITY AND MORTALITY—Continued.

Weekly morbidity and mortality table, cities of the United States, for week ended March 2—Continued.

Cities.	Population, United States census, 1910.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Smallpox.		Tuberculosis.		Typhoid fever.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cities having from 100,000 to 200,000 inhabitants—Continued.														
Dayton, Ohio	116,577	45	3	1			2		7		1		1	1
Fall River, Mass	119,295	41	1	1			4				11	3		
Grand Rapids, Mich	112,571	35			2		4				4	1	8	
Lowell, Mass	106,294	41	2	1	15	1	2				6	3	1	2
Nashville, Tenn	110,364	55	1		1						16	8	1	3
Oakland, Cal	150,174	29	4				1				2	5		
Omaha, Nebr	124,096	36	2	1	1				1			1		
Spokane, Wash	104,402		2		25		3		11		1	1		
Toledo, Ohio	168,497	66	8		29	1	6					6	3	1
Worcester, Mass	145.986		8	3	2		6	2			5	2		
Cities having from 50,000 to 100,000 inhabitants.														
Altoona, Pa	52,127	13	3	1			2				2	4		
Bayonne, N. J	55,545	8	1				11				1	1	1	
Brockton, Mass	56,878	11			119						5		1	
Elizabeth, N. J	73,409	13	1		3	1	3			1	2		1	
Evansville, Ind	69,647	34	3		1				1		1	3	3	
Fort Wayne, Ind	63,933	20	1		2		3					3		
Harrisburg, Pa	64,186	25	4		38				2		7	2		
Hartford, Conn	98,915	60	2		1		6				5	5	1	1
Hoboken, N. J	70,324		4	1							5			
Johnstown, Pa	55,482	15	3	1			1					1	1	
Kansas City, Kans	82,331		4		2		2				7		6	
Lawrence, Mass	85,892	32	2				1				1	5		
Lynn, Mass	89,336	22	1		6		3				6	2	2	1
Manchester, N. H	70,063	17	6		20				1		1		2	1
New Bedford, Mass	96,652	41	1		40		1				8	1		
Passaic, N. J	54,773	11	1		1			1			4	1		
Pawtucket, R. I	51,622	4												
Reading, Pa	96,071	46	2	3	4						1	3		
Saginaw, Mich	50,510		2				3				1		6	
San Antonio, Tex	96,614	48	1		17		4					6	2	
Schenectady, N. Y	72,826	19	2		10		1				9	2		
South Bend, Ind	53,684	14					1				1	2	2	
Springfield, Ill	51,678	11	5	1								2	2	
Springfield, Mass	88,926	24	2		31		2				5	2		
Trenton, N. J	96,815	35	2				2				5	2	1	2
Wichita, Kans	52,450	82	1											
Wilkes-Barre, Pa	67,105	23	6		10		1				5	1		
Wilmington, Del	87,411	38										2		1
Yonkers, N. Y	79,803		2	1	3		16				2	2	1	
Cities having from 25,000 to 50,000 inhabitants.														
Atlantic City, N. J	46,150	8										3		
Auburn, N. Y	34,668	10					1				1	3		
Aurora, Ill	29,807	8	1				2					1		
Berkeley, Cal	40,434	7			14						2	1		
Binghamton, N. Y	48,443	17									7	3	1	
Brookline, Mass	27,792	10	1				1				1	2		
Chattanooga, Tenn	44,604						1		1		1			
Chelsea, Mass	32,452	12	1		2		4				1			
Chicopee, Mass	25,401	11	1		1									
Danville, Ill	27,871	10	1				1					5		
East Orange, N. J	34,371	8	3		1		4							
Elmira, N. Y	37,176	11			1						11	1		
Everett, Mass	33,484	5			4		1							
Fitchburg, Mass	37,826	10									2	2		
Haverhill, Mass	44,115	16	3		11		1				7			
Kalamazoo, Mich	39,437	17					5	1	6		2	2		1
Knoxville, Tenn	36,346	16	2				1		2			2		
La Crosse, Wis	30,417	3	1				12							1
Lancaster, Pa	47,227		1		10		1				2			
Lexington, Ky	35,099	32			1		1					2		
Lynchburg, Va	29,494	15	1		31		4				2	2		
Malden, Mass	44,404	14	2		2		6				2			
McKeesport, Pa	42,694	9	2	1	1						1			

MORBIDITY AND MORTALITY—Continued.

Weekly morbidity and mortality table, cities of the United States, for week ended March 2—Continued.

Cities.	Population, United States census, 1910.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Smallpox.		Tuberculosis.		Typhoid fever.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cities having from 25,000 to 50,000 inhabitants—Continued.														
Montgomery, Ala.	38,136	18	1	....	25	....	....	....	....	....	1	1	....	1
New Castle, Pa.	36,280	....	5	....	....	....	1	....	....	....	....	....	6	....
Newport, Ky.	30,309	14	1	....	....	....	5	....	....	....	1	1	1	1
Newton, Mass.	39,806	10	....	....	34	....	1	....	....	....	1	....	....	....
Niagara Falls, N. Y.	30,445	10	3	....	....	....	....	....	....	....	....	1	....	1
Norristown, Pa.	27,875	15	1	1	70	....	....	....	....	....	....	....	....	....
Orange, N. J.	29,630	10	4	....	2	....	3	....	....	....	....	....	....	....
Pasadena, Cal.	30,291	12	....	....	....	....	1	....	....	....	....	3	....	....
Pittsfield, Mass.	32,121	8	....	....	....	....	....	....	....	....	....	....	....	....
Portsmouth, Va.	33,190	16	....	....	....	....	....	....	3	....	....	....	....	....
Racine, Wis.	38,002	6	2	....	....	....	2	....	....	....	....	1	....	....
Roanoke, Va.	34,874	8	2	....	50	....	....	....	....	....	....	3	....	....
Rockford, Ill.	45,401	32	3	....	....	....	1	....	....	....	....	3	120	6
Salem, Mass.	43,697	13	....	....	2	....	4	....	....	....	....	....	....	....
San Diego, Cal.	39,578	....	....	....	1	....	1	....	....	....	4	4	1	1
South Omaha, Nebr.	26,259	8	1	....	....	....	....	....	....	....	....	....	....	....
Superior, Wis.	40,384	5	....	....	....	....	1	....	....	....	....	1	....	....
Taunton, Mass.	34,259	15	....	....	3	....	1	....	....	....	1	2	....	....
Waltham, Mass.	27,834	7	....	....	23	....	1	....	....	....	....	....	....	....
West Hoboken, N. J.	35,403	9	5	....	2	....	....	....	....	....	3	1	....	....
Wheeling, W. Va.	41,641	11	....	....	....	....	....	....	....	....	1	....	3	....
Williamsport, Pa.	31,860	3	1	....	1	....	....	....	....	....	3	....	....	....
Wilmington, N. C.	25,748	13	....	....	11	....	....	....	1	....	2	1	1	....
York, Pa.	44,750	....	3	....	....	....	....	....	....	....	....	....	1	....
Zanesville, Ohio.	28,026	11	....	....	....	....	....	....	....	....	....	....	5	....
Cities having less than 25,000 inhabitants.														
Alameda, Cal.	23,383	7	....	....	1	....	....	....	....	....	2	1	....	....
Beaver Falls, Pa.	12,191	11	....	....	....	....	2	....	....	....	....	....	6	....
Butler, Pa.	20,782	10	....	....	....	....	....	....	....	....	....	....	....	....
Cambridge, Ohio.	11,327	3	....	....	3	....	1	....	....	....	....	....	....	....
Camden, S. C.	....	1	....	....	1	....	....	....	....	....	....	....	....	....
Carbondale, Pa.	17,040	6	....	....	3	....	4	1	....	....	....	....	....	....
Clinton, Mass.	13,075	5	....	....	....	....	....	....	....	....	1	....	....	....
Coffeyville, Kans.	12,687	....	....	....	....	....	....	....	....	....	....	....	1	....
Concord, N. H.	21,497	6	....	....	19	....	....	....	....	....	....	....	....	....
Cumberland, Md.	21,839	6	1	....	1	....	....	....	....	....	1	....	1	....
Dunkirk, N. Y.	....	....	1	....	....	....	2	....	....	....	....	....	1	....
Galesburg, Ill.	20,089	8	1	....	....	....	....	....	1	....	....	....	....	....
Gloucester, Mass.	24,398	13	....	....	....	1	....	....	....	....	....	....	1	....
Harrison, N. J.	14,498	2	2	....	....	....	....	....	....	....	2	1	....	....
Kearny, N. J.	18,659	5	1	....	14	....	1	....	....	....	1	1	....	....
La Fayette, Ind.	20,081	6	....	....	5	....	....	....	....	....	....	....	....	....
Lebanon, Pa.	19,240	....	7	....	1	....	3	....	....	....	....	....	....	....
Marinette, Wis.	....	3	....	....	....	....	2	....	....	....	....	....	1	....
Marlboro, Mass.	14,577	7	1	....	1	....	....	....	....	....	....	2	....	....
Massillon, Ohio.	....	3	....	....	....	....	....	....	....	....	....	....	....	....
Medford, Mass.	23,150	1	....	....	4	....	3	....	....	....	....	....	....	....
Melrose, Mass.	15,715	2	....	....	11	....	1	....	....	....	....	1	....	....
Moline, Ill.	24,199	4	....	....	....	....	....	....	....	....	....	....	....	1
Montclair, N. J.	21,150	5	3	....	....	....	1	....	....	....	1	1	....	....
Morristown, N. J.	12,507	7	....	....	....	....	....	....	....	....	....	1	....	....
Nanticoke, Pa.	18,507	9	1	....	4	....	....	....	....	....	....	....	....	....
Newburyport, Mass.	19,240	4	....	....	....	....	....	....	....	....	....	....	....	....
North Adams, Mass.	22,012	7	....	....	2	....	....	....	....	....	2	....	....	....
Northampton, Mass.	19,431	5	1	....	2	....	2	....	1	....	....	....	....	....
Ottumwa, Iowa.	22,012	8	....	....	....	....	1	....	....	....	....	1	....	....
Peekskill, N. Y.	....	3	2	....	....	....	....	....	....	....	....	....	....	....
Plainfield, N. J.	22,050	5	....	....	64	....	4	....	....	....	1	....	....	....
Pottstown, Pa.	....	10	....	....	3	....	....	....	....	....	....	1	....	....
Sandusky, Ohio.	19,989	3	....	....	25	....	....	....	....	....	....	1	....	2
Saratoga Springs, N. Y.	....	6	....	....	....	....	....	....	....	....	....	1	1	....
Steelton, Pa.	14,246	3	8	1	1	....	1	....	....	....	2	....	....	....
South Bethlehem, Pa.	19,973	6	....	....	5	1	....	....	....	....	....	....	....	....
Tiffin, Ohio.	11,894	4	....	....	....	....	....	....	....	....	....	....	1	....
Warren, Pa.	11,081	4	....	....	....	....	....	....	....	....	1	....	....	....
Wilkinsburg, Pa.	18,924	7	1	....	1	....	1	....	....	....	2	....	....	....
Woburn, Mass.	15,308	3	....	....	37	....	....	....	....	....	....	....	....	....

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

CONNECTICUT.—Month of February, 1912. Population of reporting towns, 1,126,841. Total number of deaths from all causes 1,550, including diphtheria 9, measles 16, scarlet fever 8, tuberculosis (pulmonary) 118, typhoid fever 4. Cases reported: Diphtheria 143 in 33 towns, measles 781 in 50 towns, scarlet fever 194 in 45 towns, smallpox 1, tuberculosis (pulmonary) 168 in 38 towns, typhoid fever 28 in 18 towns.

FLORIDA.—Week ended March 2, 1912. Reports from the State board of health show diphtheria present in 4 localities with 10 cases, malaria in 2 localities with 8 cases, smallpox in 9 counties with 68 cases, tuberculosis in 9 localities with 15 cases, typhoid fever in 5 localities with 14 cases.

KANSAS.—Month of January, 1912. Population, 1,690,949. Total number of deaths from all causes not reported. The deaths include diphtheria 7, scarlet fever 6, smallpox 1, tuberculosis 21, typhoid fever 5. Cases reported: Diphtheria 91, measles 78, scarlet fever 202, smallpox 49, tuberculosis 209, typhoid fever 39.

PENNSYLVANIA.—Reports received from the State department of health show as follows:

Month of December, 1911. *Mortality.*—The total number of deaths was 9,307, including typhoid fever 142, scarlet fever 49, diphtheria 252, measles 29, whooping cough 64, smallpox 1, influenza 100, malaria 6, tuberculosis of the lungs 774, tuberculosis of other organs 118, cancer 439, diabetes 73, pellagra 1, meningitis 48, acute anterior poliomyelitis 6, pneumonia 1,253, diarrhea and enteritis (under 2 years) 196, diarrhea and enteritis (over 2 years) 65, Bright's disease 611, early infancy 520, suicide 61, accidents in mines 104, railway injuries 136, other forms of violence 462, all other diseases 3,797.

Month of January, 1912. *Morbidity.*—The total number of cases of communicable diseases reported was 13,462, including anterior poliomyelitis 11, anthrax 1, cerebrospinal meningitis 11, chickenpox 1,427, diphtheria 1,436, erysipelas 207, German measles 45, malarial fever 3, measles 4,242, mumps 688, pellagra 3, pneumonia 883, puerperal fever 11, rabies 1, scarlet fever 1,185, smallpox 15, tetanus 5, trachoma 5, trichiniasis 3, tuberculosis 1,329, typhoid fever 772, uncinariasis 4, whooping cough 1,175.

WISCONSIN.—Three months ended December 31, 1911. Population, 2,333,860. Total number of deaths from all causes 6,010, including diphtheria 93, measles 17, scarlet fever 14, tuberculosis 481, typhoid fever 93. Cases reported: Diphtheria 824, measles 856, scarlet fever 1,114, smallpox 231, tuberculosis (pulmonary) 236, typhoid fever 374.

FOREIGN AND INSULAR.

CHINA.

Hongkong—Plague—Examination of Rats.

Surg. Brown reports: During the week ended February 3, 9 cases of plague with 8 deaths were reported at Hongkong.

During the week ended January 27, 1,824 rats were examined for plague infection, and during the week ended February 3, 1,942 rats. No plague-infected rat was found.

HAWAII.

Record of Plague Infection.

The last case of human plague at Honolulu occurred July 12, 1910.

The last plague-infected rat was found at Aiea, 9 miles from Honolulu, April 12, 1910.

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

At Hilo the last case of human plague occurred March 23, 1910. At Honokaa, 60 miles from Hilo, a fatal case occurred April 20, 1911, a fatal case February 9, 1912, and 2 fatal cases February 25, 1912.

The last plague-infected rats reported found at Honokaa were 49 found during the week ended March 2, 1912. At Hilo a plague-infected rat was found during the week ended June 10, 1911, and 2 plague-infected rats were reported found February 29, 1912.

Honolulu—Plague-Prevention Work.

Chief Quarantine Officer Ramus reports:

	Week ended Feb. 17.	Week ended Feb. 24.
Total rats and mongoose taken	422	573
Rats trapped	412	381
Mongoose trapped	10	8
Rats killed by sulphur dioxide	.....	184
Examined bacteriologically	372	503
Classification of rats trapped:		
Mus alexandrinus	54	50
Mus musculus	71	73
Mus norvegicus	54	46
Mus rattus	233	212
Average number of traps set daily	1,720	1,720
Classification of rats killed by sulphur dioxide:		
Mus alexandrinus	.....	12
Mus norvegicus	.....	171
Mus rattus	.....	171

Death from Plague at Honokaa.

Dr. Ramus reported the occurrence of a death from plague March 18, at Honokaa.

Mosquito-Eradication Measures at Honolulu.

The following statement of the work of mosquito destruction at Honolulu was received from Passed Asst. Surg. McCoy, who is detailed as sanitary adviser to the Governor of the Territory of Hawaii:

Mosquito-eradication measures conducted at Honolulu from Feb. 19 to 24, 1912, both inclusive.

Inspections of—	Total inspections.	Larvæ found in.	Ordered cleaned.	Oiled.	Drained.	Emptied.	Collected.	Filled.	Ordered repaired.	Screened.	Stocked with mosquito fish.
Gutters, house	1,643	17	30	5	14	14	.....	.....	20	.....	.....
Gutters, street	272	6	.....	69	1	.....	.....	2	.....	.....	7
Standing water	642	35	12	71	62	.....	.....	37	.....	.....	.....
Cesspools	867	22	9	21	.....	.....	.....	.....	8	.....	.....
Privy vaults	1,091	16	5	24	.....	.....	.....	.....	12	.....	.....
Holes and low places	527	119	2	77	7	.....	.....	98	.....	.....	2
Catch basins	874	34	11	94	.....	.....	.....	.....	3	.....	.....
Leaky fixtures	60	1	.....	.....	.....	.....	.....	.....	38	.....	.....
Plants, etc	2,293	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Swamps	91	16	.....	11	4	.....	.....	.....	.....	.....	.....
Ponds	33	7	.....	3	4	.....	.....	.....	.....	.....	.....
Troughs and tanks	213	18	8	.....	.....	9	.....	.....	.....	2	8
Tubs, or other receptacles	662	99	16	.....	.....	246	2	.....	.....	.....	.....
Tin cans, bottles	2,010	80	137	.....	.....	874	.....	.....	.....	.....	.....
Water barrels	381	58	6	.....	.....	80	.....	.....	.....	.....	30
Vacant houses	46	2	.....	.....	.....	.....	.....	.....	2	.....	.....
Grease traps	151	1	3	.....	.....	.....	.....	.....	.....	.....	.....
Yards	618	14	2	.....	14	.....	.....	3	.....	.....	.....

Legal notices to abate nuisances served	127
Nuisances abated	114
Rice plantations inspected	6
Wagonloads of tin cans, bottles, etc., collected	33

INDIA.

Calcutta—Cholera and Plague.

Acting Asst. Surg. Allan reports: During the week ended January 27, 49 deaths from cholera and 16 from plague were reported in Calcutta; in all Bengal, 2,184 cases of plague, with 1,740 deaths; in all India, 14,384 cases of plague, with 11,977 deaths.

ITALY.

Naples—Examination of Emigrants.

Surg. Geddings reports:

Vessels inspected at Naples and Palermo week ended February 24, 1912.

NAPLES.

Date.	Name of ship.	Destination.	Steerage passengers inspected and passed.	Pieces of baggage inspected and passed.	Pieces of baggage disinfected.
Feb. 18	Franconia	New York	.....	.....	.....
19	Wallaceton	Pensacola	.....	.....	.....
20	Italia	New York	.....	.....	.....
21	Principe di Piemonte	....do	469	60	450
23	Duca d' Aosta	....do	1,452	190	1,950
24	Sant' Anna	....do	675	90	980
24	Luigi Ciampa	....do	.....	.....	.....
	Total	.....	2,596	340	3,380

PALERMO.

Feb. 19	Emilia	New York	.....	.....	.....
22	Principe di Piemonte	....do	248	150	125
23	Citta di Palermo	New Orleans	.....	.....	.....
24	Italia	New York	.....	.....	.....
	Total	.....	248	150	125

NEW ZEALAND.

Auckland—Examination of Rats.

The following information was taken from the bulletin issued by the department of public health of New Zealand:

During the four weeks ended January 6, 1912, 356 rats were examined for plague infection and during the four weeks ended February 3, 1912, 623 rats. No plague-infected rat was found.

The last plague-infected rat was found May 31, 1911.

PHILIPPINE ISLANDS.

Antirat Regulations in Force at Philippine Ports.

MANILA, P. I., *January 3, 1912.*

Vessels coming to Manila direct from foreign ports will be required to anchor and await quarantine inspection and pratique before proceeding to the docks.

Upon arriving at the docks, all vessels, including cascoes, lighters, barges, etc., that make fast to the dock, or to any vessel that connects with the dock, will be required to observe the following precautions:

1. *Fending off from the docks.*—(*a*) Each vessel shall be fended off from the dock at least 6 feet at all points. Each vessel shall constantly use at least two fenders, placed at sufficient distances from the bow and stern to maintain the distance from the dock. (*b*) The rat shields on fenders shall be kept in position constantly.

2. *Placing rat guards on lines.*—No rat guards shall be used except those which have been approved by the quarantine service. A working plan of an approved rat guard may be obtained at the quarantine office.

3. *Raising gangways from docks at night.*—(*a*) Between sunset and sunrise, all gangways not in constant use shall be raised to a horizontal position and gangways shall be lowered and raised only when persons desire to leave and return to a vessel. (*b*) At night no vessel at a dock shall be permitted to use more than one gangway, board, or other means by which persons may reach or leave the vessel. (*c*) Large passenger vessels may keep their gangways lowered between sunset and sunrise provided that watchmen with cudgels are stationed at each gangway to prevent the escape of rats.

4. *Raising cargo chutes from docks at night.*—(*a*) All cargo chutes, boards, iron slides, or other devices used in discharging or landing cargo shall be removed between sunset and sunrise, except when special permission has been granted by the quarantine and customs officials to discharge cargo at night. (*b*) Cargo chutes shall be removed during the temporary absence of workmen, and upon the cessation of work. (*c*) When cargo chutes are in constant use, the responsible officials shall place a competent watchman with a cudgel at each cargo chute to prevent the escape of rats.

5. *Rat guards* shall be placed on all lines, ropes, cables, chains, hawsers, or other devices used in making a vessel fast, or lead to the dock, shore, or other vessel.

A rat guard shall be held to be properly applied—(*a*) When it is of a type approved by the quarantine service. (*b*) When its shank fits the lines, cables, hawsers, ropes, etc., tightly. It is usually necessary to pad the line with burlap in order that the shank of the guard may be tightly closed. (*c*) When it is tightly closed at all points and there are no openings in the shield proper. (*d*) When it is applied on the line not more than 6 feet from the vessel. (*e*) When it does not touch or overhang a dock, lighter, boat, or the shore.

When, by reason of its proximity to a vessel, it is impossible to apply a rat guard to a line, fresh tar shall be placed upon the line within 1 foot of the vessel and extending for a distance of not less than 6 feet, and a fresh coating of tar shall be applied daily.

6. *Removing lighters and boats from alongside at night.*—All boats belonging to a vessel shall be raised to the davits between sunset and sunrise, or the lines leading from the vessel to such craft in the water shall be equipped with rat guards.

No cascoes, lighters, or other cargo-carrying vessels shall be permitted to remain alongside a vessel after sunset unless cargo is actually being discharged, and then only by special permission. This also applies to all vessels from a foreign port anchored in the bay.

7. *Disposing of garbage.*—Vessels alongside docks, and those anchored or moored in the bay or harbor, shall not be permitted to throw garbage overboard. Such waste shall either be burned in the vessel's furnaces, or placed in the receptacles provided for the purpose.

8. *Docks.*—(*a*) The doors or gates which act as barriers to prevent rats from gaining access to the shore shall be kept closed as much as the traffic will permit, especially at night. (*b*) The small doors at the shore end of the docks shall be kept closed con-

stantly and automatically by means of springs or weights. (*c*) Deaths and sickness on vessels shall be reported promptly to the quarantine office. (*d*) The presence of dead rats on the piers or in the vicinity shall be reported immediately to the quarantine office. (*e*) A sufficient number of rat-catching cats or dogs shall be kept on the docks at all times. (*f*) Garbage shall not be scattered on the ground around the piers, or on the riprap. (*g*) Rat traps shall be set upon the docks every night. (*h*) Mats, straw, rubbish, and other material which may afford a nesting place for rodents shall not be permitted to accumulate upon or in the vicinity of the piers.

VICTOR G. HEISER,
Passed Assistant Surgeon, Public Health and Marine Hospital Service,
Chief Quarantine Officer for the Philippine Islands.

VESSELS AT PHILIPPINE GOVERNMENT PIERS—PRECAUTIONS TO PREVENT LANDING OF RATS.

[Manila Customhouse, General Order No. 203.]

GOVERNMENT OF THE PHILIPPINE ISLANDS,
DEPARTMENT OF FINANCE AND JUSTICE,
BUREAU OF CUSTOMS,
Manila, January 2, 1912.

PARAGRAPH I. When a foreign or coastwise vessel berths at a Philippine Government pier the master of the vessel shall, immediately after the lines have been secured to the pier, cause rat guards of sufficient size and proper construction to be placed on all the lines leading to the pier so as to prevent any rats from going ashore.

PAR. II. The master of a vessel alongside a pier shall also be required to have suitable rat guards placed on all lines leading from lighters or cascoes to the vessel.

PAR. III. No cargo shall be discharged from or received on board a vessel at a pier before suitable rat guards have been placed on all the lines leading from the carriers to the vessel and from the vessel to the pier.

PAR. IV. When a vessel berthed at a pier has not a supply of suitable rat guards on board, a sufficient number shall be loaned to the vessel by the wharfinger in charge of the pier, receipt to be taken in each case for the rat-guards and the vessel held responsible for the loss of any of the rat guards so loaned.

PAR. V. All foreign and coastwise vessels docking at the Philippine Government piers shall be fended off from the piers a distance of at least 6 feet.

PAR. VI. All cargo chutes and gangways connecting the vessel with the pier shall be removed at night, as soon as the vessel has stopped work of discharging or receiving cargo and not put in place again until the following morning. This does not apply to the gangways of passenger vessels, which need not be removed until the pier is actually closed and work has been stopped.

PAR. VII. The gates at the side entrances to the piers shall be kept closed, and the guard gates at the main entrance to the piers shall be lowered each night as soon as the work on the pier ceases.

PAR. VIII. The wharfinger in charge of the pier shall be held strictly and personally accountable while on duty for the carrying out of these regulations, with the exception of those contained in Paragraphs II and III, for the strict observance of which the customs inspector in charge of the vessel shall be held responsible. When the pier is closed and the wharfinger not on duty, the inspector in charge of the vessel during the daytime and at nighttime when the vessel works, shall be held accountable for the observance of all the regulations contained in this General Order. The night watchman on duty at the piers shall also, in the absence of the wharfinger or inspector, be required to prevent, if possible, any violation of these regulations and report all violations of same taking place during his tour of duty.

PAR. IX. For the violation of any of the provisions contained in Paragraphs I, II, and III of this General Order, the master of the vessel shall be liable to a fine of not less than ₱5, Philippine currency, and not more than ₱500, Philippine currency, in the discretion of the court.

PAR. X. A copy of this General Order, which goes into effect immediately, shall be furnished the master of each vessel berthing at a pier, by the wharfinger in charge of the pier.

H. B. MCCOY,
Insular Collector of Customs.

Approved:
GREGORIO ARANETA,
Secretary of Finance and Justice.

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX.

REPORTS RECEIVED DURING THE WEEK ENDED MAR. 22, 1912.

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

CHOLERA.

Places.	Date.	Cases.	Deaths.	Remarks.
India:				
Bassein	Jan. 21-27	15	15	
Calcutta	do		49	
Madras	Feb. 4-10	26	18	Total Madras Presidency, Jan. 1-31: Cases, 13,411; deaths, 8,509.
Negapatam	Jan. 14-27		42	
Siam:				
Bangkok	Dec. 31-Jan. 27		196	
Turkey in Asia:				
Aleppo	Feb. 18-24	4	3	Provinces, Jan. 22-Feb. 5: Cases, 11; deaths, 27.

PLAGUE.

China:				
Hongkong	Jan. 26-Feb. 3	9	8	
Hawaii:				
Honakaa	Mar. 18	1	1	
India:				
Calcutta	Jan. 21-27		16	
Karachi	Feb. 4-10	16	15	
Siam:				
Bangkok	Dec. 21-Jan. 27	1	1	
Straits Settlements:				
Singapore	Jan. 21-27	3	3	

SMALLPOX.

Australia:				
Thursday Island	Jan. 2	1		From s. s. Taiyuan.
Canada:				
Quebec	Mar. 3-9	11		
Windsor	Feb. 18-Mar. 9	5		
China:				
Hongkong	Jan. 27-Feb. 3	41	27	
Colombo:				
Ceylon	do	1		
Egypt:				
Port Said	Jan. 30-Feb. 4	1		
Gibraltar	Feb. 27-Mar. 3	1		
India:				
Bombay	Feb. 4-10	74	23	
Calcutta	Jan. 21-27		1	
Madras	Feb. 4-10	16	6	
Italy:				
Naples	Feb. 18-24	8		
Turin	Feb. 19-25	1		
Mexico:				
Aguascalientes	Feb. 26-Mar. 3		2	
Magdalena	Mar. 2			31 cases present.
Porfirio Diaz	Mar. 3-9	1	1	
Tampico	Feb. 24-Mar. 1		4	
Russia:				
Odessa	Jan. 21-Feb. 24	11		
Siam:				
Bangkok	Dec. 31-Jan. 27		700	
South Africa:				
Johannesburg	Feb. 4-10	7		
Spain:				
Valencia	Feb. 18-24	34		
Straits Settlements:				
Singapore	Jan. 21-27	3		
Turkey in Asia:				
Beirut	Feb. 18-24	150	10	
Turkey in Europe:				
Constantinople	Feb. 19-25		15	

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

REPORTS RECEIVED FROM DEC. 30, 1911, TO MAR. 15, 1912.

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

CHOLERA.

Places.	Date.	Cases.	Deaths.	Remarks.
Arabia:				
Hodeida	Jan. 21	2	1	
Ras-el-Ketib	Dec. 27-Jan. 1			Total cases, 22; deaths, 12; mainly in the military hospital.
Austria-Hungary:				
Coastland—				
Capodistria	Dec. 14-24	2	2	
Croatia and Slavonia				Total Oct. 22-Dec. 16: Cases, 36.
Sriem	Oct. 22-Dec. 16	36		
Hungary				Total Nov. 19-Dec. 23: Cases, 37. Free Dec. 28.
Backs-Bodog	Dec. 10-16	9	5	
Jasz-Nagykun-Szolnok	Dec. 3-23	11	7	
Torontal	Nov. 19-Dec. 16	17	2	
Bulgaria:				
Burgas	Nov. 22-23	2	2	
Varna	Nov. 6	1		
China:				
Hongkong	Jan. 14-20	1	1	
Dutch East Indies				Total Sept. 24-Dec. 23: Cases, 2,066; deaths, 1,494.
Batavia	Nov. 12-Dec. 23	21	8	Free Dec. 31.
India:				
Bahrein Island	Nov. 27-Dec. 30		260	In the Persian Gulf.
Bassein	Jan. 14-20	8	6	
Calcutta	Nov. 5-Jan. 28		378	
Madras	Nov. 26-Feb. 3	452	375	Madras Presidency, Nov. 1-Dec. 31: Cases, 10,436; deaths, 6,545.
Negapatam	Jan. 14-20	23		
Rangoon	Oct. 1-Nov. 30	6	3	
Indo-China:				
Saigon	Nov. 20-Jan. 29	1,412	978	
Italy				Total June 8-Dec. 31: Cases, 15,985; deaths, 6,022.
Provinces—				
Caltanisetta	Nov. 26-Dec. 31	9	7	
Girgenti	do	105	57	
Messina	Nov. 26-Dec. 2	3	2	
Syracuse	Nov. 26-Dec. 23	15	9	
Malta	Nov. 19-Dec. 10	6	6	Dec. 23 declared free from cholera.
Montenegro	Nov. 4-11	9	5	
Persia:				
Adaban	Nov. 4	1	1	
Kermanshah	Dec. 18-26		37	
Philippine Islands:				
Province—				
Union	Oct. 29-Dec. 4	5	5	
Roumania				Total Sept. 9-Dec. 13: Cases, 192; deaths, 42, including report, p. 2094, vol. 1. Free Dec. 19.
Districts—				
Braila	Sept. 11-Dec. 13	84	11	Including cases previously reported.
Convoluri	Oct. 31-Nov. 28	21	1	
Doliju	Nov. 6-Dec. 13	19	4	
Jalonitza	Oct. 31-Nov. 28	4		
Konstanza	Oct. 30-Nov. 28	8		
Prahova	Nov. 6-23	1	1	
Talomita	do	2		
Tulcea	Nov. 24-Dec. 13	15	1	
Servia				Total year 1911: Cases, 95; deaths, 51, including report, p. 2095, vol. 1.
Belgrade, district	Nov. 26-Dec. 16	6	4	Declared free Dec. 31.
Siam:				
Bangkok	Nov. 5-Dec. 30		559	
Straits Settlements:				
Singapore	Nov. 5-18	3	3	
Tripoli:				
Tripoli	Oct. 13-Jan. 24			Cases, 2,000; deaths, from 1,000 to 1,200.
Tunis Regency				Total Nov. 25-Jan. 4; Cases, 462; deaths, 323. No cases since Jan. 10.
Beja district	Nov. 25-Dec. 21	71	20	
Bizerta district	Nov. 25-Dec. 5	9	15	

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

Reports Received from Dec. 30, 1911, to Mar. 15, 1912.

CHOLERA—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Turkey in Asia				Provinces in Asia and Europe, Apr. 16–Dec. 30, 1911: Deaths, 6,111, excluding Constantinople. Mainly among troops. Jan. 6–21: Cases, 53; deaths, 50.
Acre	Jan. 21	7	6	In vicinity.
Adana	Dec. 2–6	16	5	
Aleppo	Jan. 26–Feb. 10	26	15	
Amara	Oct. 15	1	1	
Basra	Oct. 22–28	14	10	
Erzeroum, vilayet	Sept. 11–16	50	28	
Erzeroum	do	11	8	
Kaifa	Dec. 8			Present.
Kerbelah	Oct. 20–28	10	10	
Kharput	Nov. 19–Dec. 30	47	47	
Jiddah	Dec. 2–24	323	310	
Mekka	Dec. 4–24	905	879	Sept. 1–Dec. 24: Cases, 1,648; deaths, 1,565.
Mersina	Dec. 1–7	2	1	
Osmania	Dec. 1–6	2	4	
Sinope	Dec. 7	2	1	
Trebizond and vicinity	Sept. 18–23	64	34	
Tripoli	Jan. 4			Present.
Turkey in Europe:				
Constantinople	Oct. 24–Feb. 3	8	2	
Durazzo	Dec. 7–13	2		
Janina	Jan. 14–22	17	8	
Loros	Jan. 22	12	7	
Saloniki, vilayet	Nov. 6–19	4	3	In Serres.

YELLOW FEVER.

Brazil:				
Ceara	Jan. 1–31		1	
Manaos	Nov. 19–Feb. 10		18	
Para	Dec. 9–16	1	1	
Pernambuco	Jan. 1–15		2	
Ecuador:				
Bucay	Nov. 16–30	2		
Duran	Dec. 1–15	3	2	
Guayaquil	Nov. 16–Dec. 15	20	11	
Milagro	do	8	1	
Mexico:				
Espita	Dec. 31–Jan. 6	1		
Kambul, hacienda	Feb. 21–27		7	
Maxcanu	Dec. 31–Jan. 6	1		
Merida	Nov. 12–Feb. 10	18	9	Total Aug. 1–Feb. 24: Cases, 63 deaths, 29.
Puerto Mexico (Coatzocoalcos).	Feb. 28		1	
Salina Cruz	Feb. 4–7			7 cases in the lazaretto from s. s. Ikalis from Guayaquil.
Temax	Dec. 31–Jan. 6	1		
Portuguese Guinea:				
Bolama	Dec. 19–25	1	1	In an engineer on a vessel.
Venezuela:				
Caracas	Nov. 16–Jan. 15	25	8	
La Guaira	Feb. 27			Present.
Sabana Grande	Dec. 12			Epidemic.
West Indies:				
St. Vincent	Feb. 19	1		
At sea	Dec. 17–23	1	1	On a vessel en route from Manaos to Para.

PLAGUE.

Algeria:				
Philippeville	Oct. 19–Nov. 11	8	2	Including 5 cases, p. 2096, Vol. XXVI.
Brazil:				
Bahia	Sept. 1–30		2	
Para	Dec. 24–Feb. 17	18	12	
Pernambuco	Oct. 16–Jan. 16		4	
Rio de Janeiro	Nov. 12–Dec. 23	6	3	

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

Reports Received from Dec. 30, 1911, to Mar. 15, 1912.

PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
British East Africa:				
Kismayu	Oct. 15-25	2		1 case pneumonic.
Chile:				
Iquique	Nov. 12-Jan. 6	10	4	
Pisagua	Nov. 1-30	8		
China:				
Amoy	Jan. 13		1	
Hongkong	Dec. 9-Jan. 13	7	5	
Dutch East Indies:				
Java				Total Mar. 1-Dec. 30: Cases, 1,817; deaths, 1,324.
Pasoeroean Residency, Malang District.	Nov. 12-Feb. 3	83	44	
Soerobaya	Oct. 17-27	2		
German East Africa:				
Dar-es-Salaam	Nov. 13-15	1	1	From the interior via Bergamogo.
Ecuador:				
Guayaquil	Nov. 16-Dec. 15	102	42	
Egypt				Total Jan. 1-Dec. 31, 1911: Cases, 1,656; deaths, 1,041, including cases previously reported.
Provinces—				
Assiout	Jan. 1-Feb. 20	21	15	Sept. 11-16: Cases, 50; deaths, 28.
Assouan	Jan. 1-Feb. 21	23	12	
Behera	Jan. 1-25	3	2	Sept. 11-16: Cases, 11; deaths, 8.
Beni Souef	Feb. 16-21	5	2	
Fayoum	Jan. 1-26	1		
Galioubeh	Jan. 1-Feb. 18	2	2	Oct. 5-Dec. 26: Cases, 1.
Garbieh	Jan. 1-25	8	4	
Kena	Jan. 1-Feb. 22	11	9	Nov. 20-Dec. 13: Cases, 3; deaths, 3.
Minieh	Jan. 1-Feb. 1	3	2	Dec. 13: Cases, 1.
Hawaii:				
Honakaa	Feb. 9-25	3	3	
India:				
Bombay	Nov. 19-Feb. 3	113	97	
Calcutta	Nov. 11-Feb. 6		46	
Karachi	Nov. 26-Feb. 15	54	52	Total year 1911: Cases, 3,273; deaths, 3,046.
Madras	Jan. 1-6	1	1	
Rangoon	Oct. 1-Nov. 30	38	39	
Bombay Presidency and Sind.	Oct. 29-Jan. 27	46,419	33,705	
Madras Presidency	do	7,157	5,622	
Bengal	do	10,325	7,878	
United Provinces	do	27,664	24,216	
Punjab	do	2,336	1,741	
Burma	do	566	494	
Eastern Bengal and Assam	Jan. 1-6	1	1	
Central Provinces	Oct. 29-Jan. 27	11,481	9,027	
Coorg	do	86	50	
Mysore State	do	6,963	5,309	
Hyderabad State	do	19,267	17,731	
Central India	do	5,754	4,764	
Rajputana and Ajmere Merwara.	do	628	504	
North West Province	do	2	2	Total for India, Oct. 29-Jan. 27: Cases, 13,649; deaths, 111,044. Total, year 1911: Cases, 828,535; deaths, 691,849.
Indo-China:				
Saigon	Nov. 13-Jan. 22	23	2	
Mauritius	Nov. 3-Dec. 21	43	30	
Peru:				
Departments—				
Callao	Oct. 1-21	1		In November 1 case; in January 3 cases with 2 deaths.
Chiclayo	do	12	4	
Chosika	do	1	1	
Lambayeque	do	3		
Libertad	do	8		Feb. 21, 34 cases in the lazaretto.
Lima	do	13	6	Trujillo.
Philippine Islands:				
Cebu quarantine station	Dec. 4	1		On s. s. Montrose from Shanghai.
Russian Empire:				
Astrakhan, government	Sept. 21-Jan. 7	201	180	Including 73 cases and 63 deaths reported on page 2098, Vol. I.

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

Reports Received from Dec. 30, 1911, to Mar. 15, 1912.

PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Siam:				
Bangkok	Nov. 4-Dec. 2		2	
South Africa:				
Durban	Jan. 14-19	2	2	
Straits Settlements:				
Singapore	Nov. 5-Jan. 6	17	16	
Turkey in Asia:				
Jiddah	Jan. 13-Feb. 2	6	1	

SMALLPOX.

Algeria:				
Algiers	Nov. 1-30		1	
Oran	Jan. 1-31	2	1	
Arabia:				
Aden	Nov. 28-Jan. 15	5	3	And vicinity.
Argentina:				
Buenos Aires	Oct. 1-31		6	
Rosario	Oct. 1-Nov. 30		31	
Austria-Hungary:				
Bohemia	Jan. 14-20	1		
Budapest	Feb. 4-10	25		
Galicia	Dec. 24-30	1		
Krain	Jan. 14-20	7		
Trieste	Dec. 3-9	1		From s. s. Baron Call from Beirut.
Tyrol	Jan. 14-20	1		
Brazil:				
Bahia	July 1-31		1	
Pernambuco	Oct. 16-Jan. 15		388	Report for Oct. 1-15 not received.
Rio de Janeiro	Nov. 26-Jan. 20	4	1	
Santos	Dec. 12-23		1	
Canada:				
British Columbia—				
Fernie	Feb. 26-Mar. 2	2		
Nelson	Dec. 24-30	1		
Victoria	Feb. 4-10	1		
Manitoba—				
Winnipeg	Jan. 14-20	1		
Ontario—				
Kingston	Dec. 19-23	1		
Ottawa	Dec. 10-Mar. 2	69		
Sarnia	Oct. 17-Dec. 31	42		
Toronto	Jan. 6-Feb. 10	2	1	
Windsor	Feb. 4-10	2		
Quebec—				
Montreal	Dec. 17-Mar. 2	21		
Quebec	Dec. 10-Mar. 2	242	2	
Ceylon:				
Colombo	Nov. 12-18	1		
Chile:				
Iquique	Dec. 10-16	2		
La Serena	Nov. 21-30	14		
Santiago	Nov. 1-30	685	343	
Talcahuano	Nov. 26-Dec. 23	14	3	
Valparaiso	Dec. 3-9	43		Feb. 17—Decreasing.
China:				
Canton	Nov. 11-Dec. 30	40	6	
Chenghai	Jan. 29-Feb. 10			Present.
Chungking	Nov. 18-Jan. 20			Do.
Hankow	Jan. 21-Feb. 3	1	1	
Hongkong	Nov. 12-Jan. 27	209	154	
Kityang	Jan. 21-Feb. 3			Do.
Nanking	Dec. 10-Feb. 10			Do.
Shanghai	Dec. 11-Feb. 4	1	5	Deaths among natives.
Cuba:				
Habana	Dec. 19-Jan. 19	2		Case Dec. 19 from German s. s. Frankenwald, from Spain and Canary Islands; case Jan. 19 from s. s. Mexico.
Egypt:				
Cairo	Dec. 10-Jan. 14	3		
France:				
Marseille	Jan. 1-31		3	Nov. 1-30, 1 death.
Paris	Dec. 3-Feb. 17	77	5	
Germany				Total, Dec. 31-Feb. 24: Cases, 31.
Hamburg	Jan. 21-27	1		

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

Reports Received from Dec. 30, 1911, to Mar. 15, 1912.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Great Britain:				
Bristol	Jan. 29–Feb. 3	2		
London	Jan. 14–Feb. 24	6	1	
West Hartlepool	Feb. 18–24	1		
India:				
Bombay	Nov. 19–Feb. 3	148	72	
Calcutta	Nov. 19–Feb. 6		18	
Madras	Nov. 26–Jan. 27	56	33	
Rangoon	Oct. 1–Nov. 30	29	9	
Indo-China:				
Saigon	Nov. 13–Jan. 29	25	1	
Italy:				
Genoa	Dec. 1–Jan. 31	33	2	
Leghorn	Dec. 16–Feb. 24	92	1	
Messina	Nov. 19–Jan. 31		6	
Naples	Dec. 3–Feb. 17	68	1	
Palermo	Nov. 26–Feb. 17	2,279	766	
Turin	Jan. 15–Feb. 18	5		
Japan:				
Arima-Mura	Nov. 12–18	6	1	11 miles east from Kobe.
Kanagawa, ken	Dec. 17–23	1		
Kobe	Jan. 22–28	2	1	Jan. 20, 1 case from s. s. Suveric from Hongkong. Jan. 28, 1 case from Shingo Maru.
Yokohama	Jan. 22	1		From s. s. Hydra from New York via Suez.
Java:				
Batavia	Nov. 12–Feb. 3	30	7	
Malta	Dec. 24–Jan. 6	2	1	
Mexico:				
Aguascalientes	Dec. 18–Feb. 11		5	
Chihuahua	Nov. 20–Feb. 11	92	36	
Coahuila, State	Oct. 1–30		16	
Guadalajara	Jan. 14–Feb. 17	4	2	
Juarez	Dec. 19–Feb. 24	12	5	
Magdelena	Dec. 23–Feb. 24	91	49	Feb. 7, 62 cases present.
Manzanillo	Feb. 18–24	1		
Mazatlan	Dec. 11–Feb. 27		10	Feb. 13, 33 cases in the lazaretto.
Mexico	Nov. 26–Jan. 20	61	33	
Monterey	Dec. 11–24		2	
Porfirio Diaz	Dec. 3–Feb. 24		32	
Salina Cruz	Feb. 11–17	2	1	
San Antonio	Jan. 1–21	12	9	
San Carlos	....do			Present.
Sandoval	Dec. 16			Do.
San Ignacio	Jan. 8	3		
Saric	Jan. 21–27		6	
Santa Ana	Jan. 8	4		
San Luis Potosi	Nov. 12–Dec. 30	3	1	
Tampico	Dec. 1–Feb. 20		10	
Tapachula	Nov. 1–Dec. 31		14	
Portugal:				
Lisbon	Dec. 9–Feb. 24	38		
Russia:				
Batum	Dec. 1–31	1		
Libau	Dec. 17–23	1		
Moscow	Nov. 19–Feb. 3	26	10	
Odessa	Nov. 26–Jan. 13	10	1	
Reval	Nov. 1–30	1		
Riga	Dec. 24–Jan. 27	16		Oct. 1–Nov. 30; deaths, 2.
St. Petersburg	Nov. 19–Feb. 3	122	22	
Warsaw	Nov. 5–Dec. 2		185	
Siam:				
Bangkok	Nov. 5–Dec. 30		626	
Siberia:				
Omsk	Jan. 1–31	7		
South Africa:				
Durban	Jan. 21–27	1		
Johannesburg	Jan. 7–27	29		
Spain:				
Barcelona	Feb. 6–12		1	
Cadiz	Nov. 1–Jan. 31		22	
Madrid	Dec. 1–Jan. 31		3	
Malaga	Nov. 1–30		45	
Seville	Dec. 1–31		5	
Valencia	Dec. 3–Feb 17	165	11	
Straits Settlements:				
Singapore	Nov. 19–Jan. 13	18	7	

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

Reports Received from Dec. 30, 1911, to Mar. 15, 1912.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Switzerland:				
Cantons—				
Oberwalden	Jan. 14-20	1		
Zurich	Dec. 3-23	6		
Teneriffe:				
Santa Cruz	Dec. 3-Feb. 17		42	
Turkey in Asia:				
Beirut	do	855	77	
Turkey in Europe:				
Constantinople	Dec. 4-Feb. 18		65	
Uruguay:				
Montevideo	Sept. 1-Dec. 31	25	4	
Venezuela:				
Caracas	Nov. 1-Jan. 15	11	2	
Zanzibar:				
Zanzibar	Oct. 28-Dec. 15	3	2	

MORTALITY.

WEEKLY MORTALITY TABLE, FOREIGN AND INSULAR CITIES.

Cities.	Week ended—	Estimated population.	Total deaths from all causes.	Deaths from—										
				Tuberculosis.	Plague.	Cholera.	Yellow fever.	Smallpox.	Typhus fever.	Typhoid fever.	Scarlet fever.	Diphtheria.	Measles.	Whooping cough.
Aguascalientes	Mar. 3	40,000	50	3	....	....	....	2	2	....	....	....	1	....
Aix la Chapelle	Feb. 10	157,512	60	6	....	....	....	....	1	....	....	....	....	3
Amsterdam	Feb. 24	566,131	143	24	....	....	....	....	....	....	....	1	1	3
Antwerp	Feb. 17	316,604	73	9	....	....	....	....	....	....	....	....	1	....
Assuncion	Jan. 13	75,000	28	....	....	....	....	....	....	5	....	....	....	....
Athens	Feb. 19	250,010	76	20	....	....	....	....	....	....	....	1	4	....
Barmen	Feb. 10	170,900	.....	10	....	....	....	....	1	....	1	2	....	....
Do	Feb. 17	.....	.....	4	....	....	....	....	....	....	2	1	....	....
Batavia	Jan. 27	217,630	.....	....	....	....	....	1	....	....	....	....	....	....
Do	Feb. 3	.....	.....	....	....	....	....	1	....	....	....	....	....	....
Beirut	Feb. 17	80,000	20	....	....	....	....	10	....	10	....	....	....	....
Do	Feb. 24	.....	140	....	....	....	....	10	....	5	....	....	....	....
Belfast	do	385,492	202	19	....	....	....	....	....	....	....	....	....	9
Belgrade	Feb. 17	90,050	37	....	....	....	....	....	....	....	1	1	....	....
Bergen	do	87,749	33	5	....	....	....	....	....	....	....	1	....	....
Do	Mar. 2	.....	22	6	....	....	....	....	....	1	2	....	....	....
Birmingham	Feb. 24	842,512	242	....	....	....	....	....	....	....	....	1	....	12
Bombay	Feb. 10	979,445	699	46	12	....	....	23	....	....	....	....	9	....
Bremen	do	246,850	79	7	....	....	....	....	....	....	1	2	3	....
Do	Feb. 24	.....	86	7	....	....	....	....	....	....	1	4	9	....
Bristol	do	359,400	116	7	....	....	....	....	....	2	1	....	5	1
Brussels	do	649,846	216	26	....	....	....	....	....	2	2	2	4	1
Budapest	Feb. 10	881,600	.....	....	....	....	....	....	....	....	4	3	4	1
Cairo	Feb. 4	689,439	435	33	....	....	....	....	3	3	....	7	....	....
Calcutta	Feb. 27	890,493	480	23	16	49	....	1	....	....	....	....	....	....
Chemnitz	Jan. 20	297,150	99	8	....	....	....	....	....	....	....	1	....	....
Do	Feb. 3	297,150	82	7	....	....	....	....	....	....	....	1	....	....
Do	Feb. 10	298,400	86	5	....	....	....	....	....	....	....	1	2	1
Do	Feb. 17	.....	75	6	....	....	....	....	....	....	....	1	1	....
Christiana	Feb. 24	246,000	71	9	....	....	....	....	....	....	....	4	....	....
Coburg	Feb. 17	24,299	.....	2	....	....	....	....	....	....	....	1	....	....
Cologne	do	525,671	198	21	....	....	....	....	....	....	1	4	3	6
Colombo	Jan. 27	227,026	150	16	....	....	....	....	10	....	....	....	....	....
Do	Feb. 3	.....	126	12	....	....	....	....	....	9	....	....	....	....
Constantinople	Feb. 18	1,000,000	288	35	....	....	....	12	....	5	3	1	7	....
Do	Feb. 25	.....	341	37	....	....	....	15	....	6	4	2	5	....
Copenhagen	Feb. 10	465,000	152	18	....	....	....	....	....	....	3	1	....	3
Dublin	Feb. 17	406,536	197	27	....	....	....	....	....	....	....	1	3	1
Do	Feb. 24	.....	194	26	....	....	....	....	....	1	2	1	2	4
Dundee	do	171,006	50	5	....	....	....	....	....	....	....	1	....	2

MORTALITY—Continued.

Weekly mortality table, foreign and insular cities—Continued.

Cities.	Week ended—	Estimated population.	Total deaths from all causes.	Deaths from—									
				Tuberculosis.	Plague.	Cholera.	Yellow fever.	Smallpox.	Typhus fever.	Typhoid fever.	Scarlet fever.	Diphtheria.	Measles.	Whooping cough.
Edinburgh	Feb. 24	321,200	114	10	....	....	....	....	....	....	....	2	4	2
Erfurt	Feb. 17	126,010	41	1	....	....	....	....	....	....	....	4	....	....
Frankfort on the Main	Feb. 10	423,600	106	....	....	....	....	....	....	....	....	3	....	2
Do	Feb. 17	....	111	....	....	....	....	....	....	....	....	3	....	1
Ghent	do	166,235	62	5	....	....	....	....	....	....	....	1	....	1
Gibraltar	Mar. 3	25,367	10	1	....	....	....	....	....	....	....	....	1	....
Glasgow	Mar. 1	785,600	325	....	....	....	....	....	....	2	1	10	41	4
Greenock	Feb. 24	75,900	34	2	....	....	....	....	....	....	....	....	2	....
Halifax	Mar. 2	46,000	13	2	....	....	....	....	....	....	1	....	....	....
Hamburg	Feb. 24	953,079	291	45	....	....	....	....	....	....	5	8	2	3
Hongkong	Feb. 3	336,488	....	....	8	....	....	27	....	....	....	1	....	....
Hull	Feb. 24	282,987	95	....	....	....	....	....	....	1	....	....	....	....
Do	Mar. 2	....	85	....	....	....	....	....	....	1	....	....	....	1
Karachi	Feb. 10	108,644	119	....	15	....	....	....	....	....	....	....	22	....
Kingston	Mar. 9	21,000	7	2	....	....	....	....	....	....	....	....	....	....
Kobe	Feb. 11	418,646	160	....	....	....	....	....	....	2	....	....	....	....
Konigsberg	Feb. 17	252,000	111	15	....	....	....	....	....	....	....	....	4	3
Leeds	Feb. 24	445,568	145	15	....	....	....	....	....	....	2	4	....	5
Leipzig	Feb. 10	605,755	165	28	....	....	....	....	....	1	....	2	....	....
Leith	Feb. 24	81,000	31	1	....	....	....	....	....	....	....	3	1	....
Liege	Feb. 10	167,521	68	7	....	....	....	....	....	1	....	....	....	....
Do	Feb. 24	167,676	61	2	....	....	....	....	....	....	1	....	3	1
Liverpool	Feb. 2	752,055	294	27	....	....	....	....	....	1	4	....	4	2
London	Feb. 24	7,340,125	1,981	....	....	....	....	....	....	6	5	16	12	34
Madras	Feb. 10	518,660	433	....	....	18	....	6	....	....	....	....	....	....
Montreal	Mar. 9	466,197	181	21	....	....	....	....	....	1	1	2	....	3
Nagasaki	Feb. 11	179,257	40	3	....	....	....	....	....	1	1	....	....	....
Newcastle-on-Tyne	Feb. 3	269,193	98	13	....	....	....	....	....	....	2	1	1	1
Do	Feb. 10	....	110	6	....	....	....	....	....	1	1	1	....	1
Do	Feb. 17	....	96	12	....	....	....	....	....	2	....	....	....	1
Do	Feb. 24	....	82	12	....	....	....	....	....	1	1	....	....	....
Nottingham	Feb. 17	260,000	90	5	....	....	....	....	....	....	....	1	12	2
Ottawa	Mar. 2	90,000	32	2	....	....	....	....	....	....	....	1	....	....
Prague	Feb. 17	225,204	109	10	....	....	....	....	....	2	2	....	4	1
Paris	do	2,888,110	1,143	258	....	....	....	....	....	7	3	5	31	3
Porfirio Diaz	Mar. 9	16,000	....	1	....	....	....	1	....	....	....	....	....	....
Port Said	Feb. 4	52,811	31	....	....	....	....	....	....	1	....	....	....	....
Quebec	Mar. 9	78,200	....	2	....	....	....	....	....	....	....	....	....	....
Rangoon	Jan. 27	293,316	208	....	5	....	....	2	....	....	....	....	....	....
Do	Feb. 3	....	182	....	....	....	....	4	....	....	....	....	....	....
Rotterdam	Feb. 17	437,006	118	....	....	....	....	....	....	1	1	....	....	....
Do	Feb. 24	....	114	....	....	....	....	....	....	....	....	1	....	....
San Luis Potosi	Dec. 30	82,967	50	....	....	....	....	1	1	....	....	....	....	....
Santa Cruz de Tenerife	Feb. 17	46,000	17	1	....	....	....	5	....	....	....	....	....	....
Santos	Dec. 30	85,000	39	3	....	....	....	....	....	1	....	....	....	....
Sarnia	Mar. 9	9,936	5	....	....	....	....	....	....	2	....	....	....	....
Shanghai	Feb. 11	500,000	186	23	....	....	....	....	....	....	2	1	25	....
Sheffield	Feb. 10	455,000	194	16	....	....	....	....	....	4	1	1	2	....
Do	Feb. 24	....	164	8	....	....	....	....	....	1	....	2	....	11
Singapore	Jan. 27	303,328	196	32	3	....	....	....	....	2	....	....	....	....
Southampton	Mar. 2	120,891	34	5	....	....	....	....	....	....	....	....	....	1
South Shields	Feb. 3	109,676	54	4	....	....	....	....	....	....	1	2	....	1
Do	Feb. 17	....	48	5	....	....	....	....	....	1	....	....	....	1
Do	Feb. 24	....	23	1	....	....	....	....	....	....	....	....	....	1
Stettin	Feb. 17	234,033	65	9	....	....	....	....	....	....	....	2	....	....
Stoke-on-Trent	Feb. 24	237,153	72	7	....	....	....	....	....	....	....	1	1	1
Do	Mar. 2	....	74	5	....	....	....	....	....	....	....	1	2	....
Swansea	Jan. 20 / Mar. 2	117,314	222	25	....	....	....	....	....	....	2	7	4	12
Tampico	Mar. 1	23,452	40	....	....	....	....	4	....	....	....	....	....	....
Trieste	Feb. 17	233,599	88	....	....	....	....	....	....	....	....	3	1	1
Turin	Feb. 25	430,770	165	15	....	....	....	....	....	....	....	2	2	2
Valencia	Feb. 17	240,000	98	9	....	....	....	....	....	....	....	....	....	....
Do	Feb. 24	....	104	5	....	....	....	....	....	1	....	1	....	....
Vienna	Feb. 10	2,064,583	719	119	....	....	....	....	....	1	2	6	5	2
West Hartlepool	Feb. 24	63,932	19	....	....	....	....	....	....	....	....	....	....	....
Yokohama	Feb. 19	444,039	....	....	....	....	....	....	....	....	....	1	....	....
Winnipeg	Mar. 2	151,958	65	3	....	....	....	....	....	....	....	1	1	....

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

ARGENTINA—*Buenos Aires.*—Month of December, 1911. Population, 1,360,406. Total number of deaths from all causes 2,155, including diphtheria 21, measles 17, scarlet fever 3, tuberculosis 196, typhoid fever 19.

BRAZIL—*Ceara.*—Month of January, 1912. Population, 60,000. Total number of deaths from all causes 134, including tuberculosis 15, typhoid fever 5, yellow fever 1.

CANADA—*Hamilton.*—Month of February, 1912. Population, 82,000. Total number of deaths from all causes 100, including tuberculosis 4.

Sherbrooke.—Month of February, 1912. Population, 17,700. Total number of deaths from all causes 22, including diphtheria 2, tuberculosis 5.

FRANCE—*St. Etienne.*—Two weeks ended February 15, 1912. Population, 150,000. Total number of deaths from all causes 149, including diphtheria 1, measles 1, scarlet fever 1, tuberculosis 22, typhoid fever 3.

GERMANY—*Kehl.*—Month of January, 1912. Population, 182,426. Total number of deaths from all causes 245, including diphtheria 2, scarlet fever 1, tuberculosis 37.

GREAT BRITAIN—Week ended February 17, 1912:

England and Wales.—The deaths registered in 77 great towns correspond to an annual rate of 18.6 per 1,000 of the population, which is estimated at 17,559,219.

Ireland.—The deaths registered in 21 principal town districts correspond to an annual rate of 26.6 per 1,000 of the population, which is estimated at 1,157,014. The lowest rate was recorded at Tralee, viz, 5.3, and the highest at Armagh, viz, 41.2 per 1,000.

Scotland.—The deaths registered in 18 principal towns correspond to an annual rate of 22.1 per 1,000 of the population, which is estimated at 2,182,400. The lowest rate was recorded at Leith, viz, 12.2, and the highest at Perth, viz, 33.2 per 1,000. The total number of deaths from all causes was 923, including diphtheria 6, measles 63, scarlet fever 2, typhoid fever 4.

ITALY—*Florence.*—Month of January, 1912. Population, 239,295. Total number of deaths from all causes 473, including diphtheria 3, measles 5, tuberculosis 44, typhus fever 3.

MALTA.—Three weeks ended February 17, 1912. Population, 213,395. Total number of deaths from all causes 235, including measles 3, tuberculosis 10, typhoid fever 4.

URUGUAY—*Montevideo.*—Month of December, 1911. Population, 321,224. Total number of deaths from all causes 571, including diphtheria 1, tuberculosis 65.

By authority of the Secretary of the Treasury:

RUPERT BLUE,
Surgeon General,
United States Public Health and Marine-Hospital Service.

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