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SEWAGE-POLLUTED WATER SUPPLIES IN RELATION TO INFANT MORTALITY.

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The object of this bulletin is to invite attention to the excessive prevalence of "diarrhea and enteritis" of children in certain cities and towns, coincident with a polluted water supply. It will be apparent also that there is generally a parallelism between the curves for typhoid fever and enteritis in the winter months suggesting that water is a factor in the prevalence of both. Attention is invited to these conditions in the hope that cooperation between practicing physicians and local health officers will effect two things:

1. Investigation of deaths in the group classified as diarrhea and enteritis.

2. A wider use of municipal laboratories especially in the diagnosis of typhoid fever and dysentery.

These results can be attained only by the hearty cooperation of practicing physicians with the health officer. It is hoped that this cooperation will be effected, and out of this closer relation will come an earlier recognition and notification of typhoid fever and bacillary dysentery cases, and consequently more prompt and efficient control of the excreta of such patients.

An investigation of this group of diseases will probably reveal facts of the greatest value in relation to bacillary dysentery and other intestinal infections. No more promising field presents itself in the great problem of infant mortality than the study of the intestinal discharges of sick children. After giving due weight to the influence of climatic, racial, social, and economic conditions the so-called non-specific factors, one must admit that these after all are only predisposing factors and that the greater number of deaths from enteritis under 2 years are probably caused by specific organisms, some well known and others of which we know little. It has been suggested that the vital resistance to disease is low in neglected young infants and that this vital resistance is lowered by syphilis and improper artificial feeding. The inference is that normal inhabitants of the human intestine, such as the bacillus coli, may attain sufficient virulence in such cases to cause severe diarrheas and sometimes death. There is little convincing proof of such an occurrence. Failure to find well-known organisms, such as the bacillus dysenteriæ, in summer diarrheas of children, must be ascribed in a portion of the failures to faulty

technique, but in the great majority of cases the diagnosis is made as diarrhea or enteritis without any bacteriologic procedure.

These neglected, improperly fed babies may prove easier victims than their healthier brothers and sisters to typhoid fever or dysentery, but such an explanation is not necessary to account for the absence of classical symptoms of well-known diseases in children.

Typical symptoms of well-known diseases are recognized with difficulty in children and are frequently absent. Nervous manifestations are often predominant. Cases of Asiatic cholera in young children in the Philippines often present none of the classic symptoms, but instead are frequently diagnosed as convulsions, meningitis, or enteritis.

The mistaken diagnoses and in consequence the uncontrolled excreta of contagious intestinal disease are not justly attributable to an atypical clinical picture, but must be charged to the failure to establish the diagnosis by bacteriologic methods.

It is not unlikely that because of the atypical clinical picture in children, well-known diseases often do escape recognition and are responsible for many deaths now recorded as due to inanition, convulsions, marasmus, or some other indefinite diagnosis. Because of the common presence of diarrhea in sick infants a great many cases are diagnosed as diarrhea or enteritis without effort to determine the specific cause.

It is not intended to suggest that these infectious agents are purely water-borne germs. On the contrary, as we know in typhoid fever, Asiatic cholera, and bacillary dysentery, the causative agent may be transmitted in many other ways, and it is reasonable to suppose that other pathogenic organisms from the human intestines have a similar versatility in modes of transmission. Attention is invited to the rôle played by water merely as one phase of the problem. A thorough investigation in any city will bring out clearly the relative importance of dirty fingers, flies, and other factors in transmission.

Contact is probably one of the greatest factors in the transmission of diarrhea and enteritis. It is also the factor responsible for the persistence of the disease from year to year. In the winter the contact factor is reduced, but operates at a low rate which increases in the hot months. Flies and other factors augment the increased rate due to contact in the hot season. It is because of the contact factor that the breast-fed infant does not escape. The greater prevalence in bottle-fed babies is probably due to greater opportunities for infection. Young infants drink little water, and the effect of polluted water on infant mortality is probably most active through being mixed with milk. To polluted water also must be charged the infections in children resulting from contact with those who have contracted the disease through water.

THE RELATION OF SEWAGE-POLLUTED WATER SUPPLIES TO THE GENERAL DEATH RATE.

In the Journal of Infectious Diseases, August 24, 1910, Sedgwick and MacNutt describe what they call the Mills-Reincke phenomenon.[1] This is a marked decrease in the general death rate of cities independent of the reduction in typhoid-fever deaths following the substitu-

[1] Sedgwick and MacNutt: Journ. Infec. Dis., vol. 7, Aug. 24, 1910, pp. 489–564.

tion of a safe for a polluted public water supply. In the same article these writers accentuate the statement of Allen Hazen concerning the relation of a polluted water supply to the general death rate, which is known as Hazen's theorem. Hazen's statement was as follows:

> Where one death from typhoid fever has been avoided by the use of better water, a certain number of deaths, probably two or three, from other cases have been avoided.

Sedgwick and MacNutt found abundant evidence of the occurrence of the Mills-Reincke phenomenon in studying the statistics of Hamburg, Lawrence, Lowell, Albany, and Binghamton. They also found that Hazen's "quantitative expression for the Mills-Reincke phenomenon" when applied to the cities which they studied, was sound and conservative. In their work Sedgwick and MacNutt brought out the close relation between polluted water and infant mortality. This fact had also been demonstrated by Reincke of Hamburg who laid especial stress on the diarrheal diseases of children. The general death rate is based upon the total number of deaths into the production of which a great many factors enter. Some of these factors are fairly constant; others are subject to great variation. Obviously it is more difficult to establish the relation between polluted water and the sum of factors, many of which have nothing to do with water, than to show the relation between water and diseases which are commonly water-borne. This difficulty seemed to be reduced by substituting infant mortality for the general mortality. This also is a vague, indefinite method, as infant mortality is made up of a great many different entities, and is subject to considerable fluctuation, due to the epidemic diseases of childhood, the connection of which with water is problematical or doubtful to say the least.

For these reasons the Mills-Reincke phenomenon could not be expected to be always present. Coincident with the substitution of a safe for a polluted water supply, an epidemic of whooping cough, measles, or scarlet fever might more than offset the reduction due to water. Or there might be an increase in pneumonia or diphtheria, which would prevent the general death rate from dropping.

The following charts (1, 2, 3, 4) show four cities which, after the installation of better water supplies, experienced marked reduction in the typhoid-fever rate.

TABLE No. 1.—CITY OF PITTSBURGH, PA.

Deaths from certain diseases before and after filtration of the public water supply.

Causes of death.	Before filtration.			After filtration.		
	1905	1906	1907	1908	1909	1910
All causes	9,951	10,097	9,930	9,030	8,343	9,603
Under 1 year	2,432	2,554	2,405	2,195	1,930	2,259
Typhoid fever	574	728	645	255	130	149
Measles	215	122	68	247	44	177
Scarlet fever	191	81	46	84	70	119
Whooping cough	165	86	205	48	68	77
Diphtheria	128	178	130	98	82	136
Tuberculosis	897	876	765	762	729	625
Broncho-pneumonia	232	367	508	566	.....	.....
Lobar pneumonia	1,081	873	830	686	745	.....
Diarrhea and enteritis	831	973	915	822	735	949

Summary.

Causes of death.	Average annual number of deaths, 3 years, 1905, 1906, 1907.	Average annual number of deaths, 3 years, 1908, 1909, 1910.	Average yearly decrease in deaths.
All causes	9,993	8,992	1,001
Under 1 year	2,695	2,128	467
Typhoid fever	649	178	471
Diarrhea, under 2 years	906	835	71
Tuberculosis	846	705	141

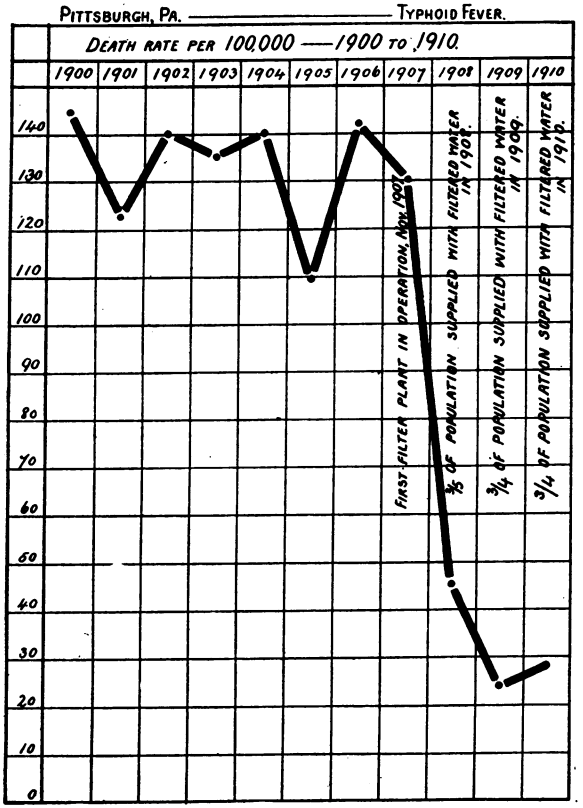

Chart No. 1.

Pittsburgh's reduction in typhoid fever was prompt and consistent. There has been an average of 1,000 actual deaths less each year since the installation of the filters. The average typhoid-fever reduction has been 471 deaths per year, so that for each death from typhoid fever avoided there have been 1.1 deaths less from all other causes. This is considerably less than Hazen's theorem suggests. There were 141 deaths less from tuberculosis, but the decline in tuberculosis has been gradual for some years.

TABLE NO. 2.—CITY OF PHILADELPHIA, PA.

Deaths from certain diseases before and after filtration of the public water supply.

Causes of death.	Before filtration.			After filtration.		
	1905	1906	1907	1908	1909	1910
All causes	25,058	27,768	27,476	25,926	25,029	27,045
Under 1 year	5,263	6,010	5,522	5,386	4,992	5,334
Typhoid fever	724	1,078	890	529	341	272
Measles	94	404	99	266	231	164
Scarlet fever	67	74	120	208	147	152
Whooping cough	168	396	214	225	122	318
Diphtheria	466	566	494	489	511	479
Tuberculosis	3,365	3,742	3,717	3,490	3,496	3,191
Broncho-pneumonia	525	826	709	848	.....	.....
Lobar pneumonia	1,388	1,519	1,667	1,389	1,356	.....
Diarrhea and enteritis, under 2 years	1,739	2,184	1,886	1,835	1,791	2,336

Summary.

Causes of death.	Average annual number of deaths, 1905, 1906, 1907.	Average annual number of deaths, 1908, 1909, 1910.	Average yearly decrease in deaths.
All causes	26,767	26,000	767
Typhoid fever	897	381	516
Diarrhea and enteritis, under 2 years	1,936	1,987	.....

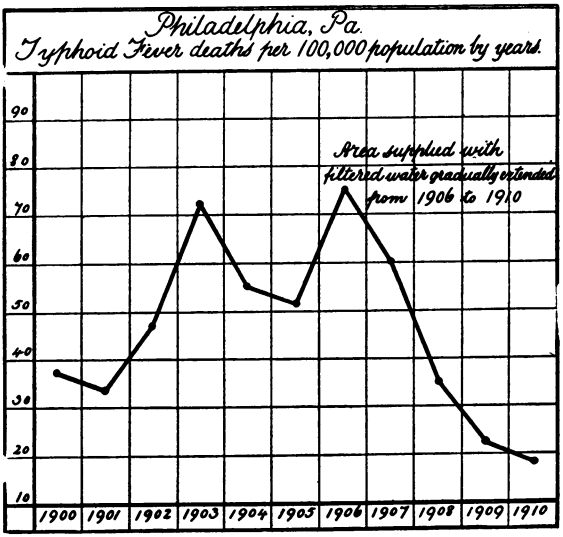

Chart No. 2.

Philadelphia does not conform to the quantitative expression of the Mills-Reincke phenomenon, taking an average of three years before and after the installation of the filters. Tuberculosis shows the same steady progressive fall both before and after filtration which was noted in Pittsburgh.

These two cities, Pittsburgh and Philadelphia, while they effected remarkable reductions in their typhoid fever rates, have the disad-

vantage of furnishing unfiltered polluted water to a portion of the population. Cincinnati and Columbus are better examples of the effect of improved water supplies, as their filtered-water systems cover the entire area of the city.

TABLE No. 3.—CITY OF CINCINNATI, OHIO.

Deaths from certain diseases before and after filtration of the public water supply.

Causes of death.	Before filtration.			After filtration.		
	1905	1906	1907	1908	1909	1910
All causes	6,609	7,179	6,423	6,450	5,938	6,319
Under 1 year	948	1,147	901	943	844	917
Typhoid fever	141	247	161	65	48	32
Measles	10	116	33	34	1	29
Scarlet fever	75	14	6	31	17	16
Whooping cough	57	19	13	29	22	30
Diphtheria	79	79	53	57	41	36
Tuberculosis	997	1,061	926	995	979	1,003
Broncho-pneumonia	140	194	169	162	.....	.....
Lobar pneumonia	441	389	373	404	362	.....
Diarrhea and enteritis	245	366	265	301	282	328

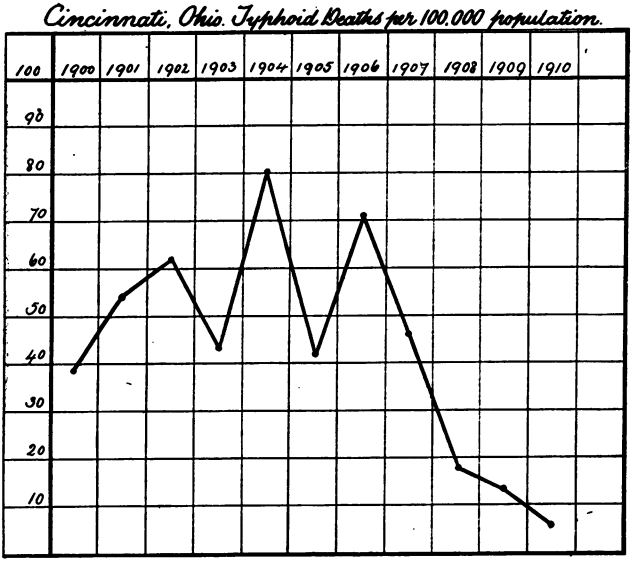

Chart No. 3.

Summary.

Causes of death.	Average annual number of deaths, 1905, 1906, 1907.	Average annual number of deaths, 1908, 1909, 1910.	Average yearly decrease in deaths.
All causes	6,737	6,235	502
Typhoid fever	183	48	135

TABLE No. 4.—CITY OF COLUMBUS, OHIO.

Deaths from certain diseases, before and after filtration of the water supply.

Causes of death.	Before filtration.			After filtration.		
	1905	1906	1907	1908	1909	1910
All causes	2,224	2,361	2,470	2,489	2,365	2,810
Under 1 year	277	364	329	336	316	397
Typhoid fever	121	54	57	168	33	33
Measles	.....	7	1	5	16	43
Scarlet fever	3	8	2	1	2	6
Whooping cough	14	7	12	15	5	19
Diphtheria	35	20	15	14	9	21
Tuberculosis	328	352	346	331	318	337
Broncho-pneumonia	31	35	52	30	.....	.....
Lobar pneumonia	184	179	160	144	113	.....
Diarrhea and enteritis	67	71	78	51	83	115

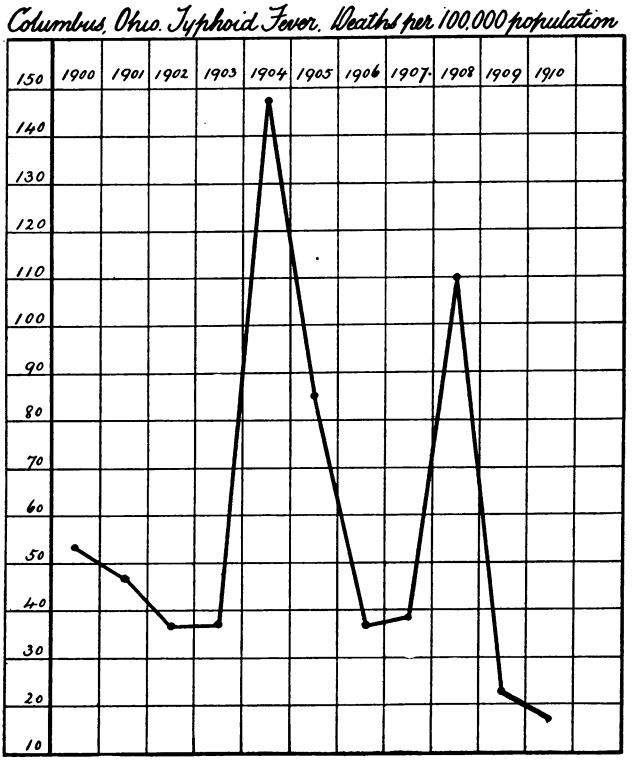

Chart No. 4.

Summary.

Causes of death.	Average annual number of deaths, two years, 1907, 1908.	Average annual number of deaths, 1909, 1910.	Average yearly decrease in deaths.
All causes	2,479	2,587	Increase.
Typhoid fever	225	66	159

Cincinnati seems to conform to Hazen's theorem, but Columbus does not, showing an increase in total deaths coincident with a marked typhoid decrease.

Many things may be cited which have a direct reducing influence on the general death rate—the use of diphtheria antitoxin, the campaign against tuberculosis, greater general knowledge of hygiene and the prevention of disease, the campaign for pure milk, and the educational work for the reduction of infant mortality. For these reasons if a gradual decline in the general death rate is noted coincident with or following an improvement in the public water supply, it can not be ascribed with any certainty to the improvement in the water.

If, however, there is a synchronous marked reduction below the average for a number of years, in certain diseases which are known to be water-borne, and especially if this reduction is effected in the winter and spring months, it is fair to assume that the improved water supply was the principal factor in this reduction.

Two distinct reasons are assigned for the reduction in the general mortality independently of typhoid fever which so often follows the installation of better water supplies. First, the increased vital resistance due to drinking a better water; second, exclusion of disease-producing organisms. It has been suggested that possibly a combination of these two is responsible. There is considerable evidence to show that the exclusion of disease-producing germs from the water is the principal factor in reducing the general mortality in so far as water is concerned.

In addition to the exclusion of the bacillus typhosus and the vibrio choleræ Asiaticæ, pure water means the exclusion of the causative organisms of bacillary dysentery, and probably other causative agents in diarrheal diseases of which we know little. The evidence that the so-called winter cholera is due to sewage-polluted water supplies may be considered incontrovertible. The exact nature of this alleged disease is unknown, but its existence and relation to polluted water have been shown conclusively at Erie, Pa., Escanaba, Lansing, and Mackinac Island, Mich., Michigan City, Ind., and other places.

There is no doubt that part of the reduction in the general death rate is due to a reduction in the deaths frequently certified to as "malaria," "typho-malarial fever," "typhoid pneumonia," and even "pneumonia" itself because of mistaken diagnosis. In many places there is very good reason to believe that there is a big reduction effected in fatal diarrhea of children really due to the bacillus typhosus. There is in some sections of the country a fixed idea that typhoid fever is a disease of adults and is rarely found in children. There is another common fallacy, that typhoid fever is a disease of summer and autumn only. It is due to these ideas that physicians are sometimes loath to diagnose typhoid fever in a child or to declare its existence in adults in the winter or spring. A health commissioner of one of the lake cities exhibited to the writer his record of cases reported in August, September, and October, pointing out the fact that there were nearly 10 cases reported for each death from typhoid fever. This was very creditable, but his records for January, February, March, and April showed that the cases reported scarcely exceeded the deaths. Very often the water supply is known to be polluted and the number of deaths from typhoid in the winter months shows that there is an undue prevalence of the disease in winter. The cases reported in relation to deaths would indicate perhaps a case

mortality of 80 or 90 per cent. It is clear that in such instances the bulk of the nonfatal cases are not diagnosed as typhoid fever, and it is very probable that many fatal cases are certified as something else. In such cities it is not strange that the substitution of a safe for a polluted water supply effects a reduction not only in typhoid fever but in the general mortality as well.

DIARRHEA AND ENTERITIS UNDER 2 YEARS OF AGE IN THE UNITED STATES.

In the registration cities of the United States about 20 per cent of the total mortality occurs in infants under 1 year of age. The importance of infant mortality in relation to general death rate is at once apparent.

In considering infant mortality one of the greatest factors is the group of entities classified as diarrhea and enteritis. In the registration area in 1910 there were 154,373 deaths of children under 1 year, and 44,695 of these, or about 28 per cent, were ascribed to diarrhea and enteritis.

In the mortality statistics of the Bureau of the Census, under the name of diarrhea and enteritis, are grouped a number of different entities of diverse etiology. About 85 per cent of these deaths occur in children under two years of age. The fact that several distinct entities are included complicates the study of this group, and usually no attempt is made to separate these entities upon a specific etiologic basis. It is generally conceded, however, that certain nonspecific factors bear an etiologic relation to diarrhea and enteritis. At least the presence of one or more of these factors in marked degree is deemed sufficient to explain a high rate for diarrhea and enteritis in cities. These nonspecific etiologic factors may be divided into climatic, racial, social, and economic.

Climatic Influences.

The influence of climate upon enteritis is conceded, but the manner in which this influence is exerted is still in doubt. The enteritis of children, including cholera infantum, is a summer disease, and if we exclude water or milk borne epidemics of specific enteritis, it should have a very low prevalence in the months from November to April. Naturally the southern cities, with their longer summer, on this ground alone are entitled to a higher rate for the hot-weather enteritis of children. Table No. 5 shows American cities with populations ranging from 100,000 to 300,000:

Table No. 5.—*Cities having a population of from 100,000 to 300,000—Death rate per 100,000 from enteritis, all ages—Average for 8 years, 1901 to 1908.*

City.	Rate.	City.	Rate.
St. Joseph, Mo.	37.5	Syracuse, N. Y.	111.3
Omaha, Nebr.	54.8	New Haven, Conn.	116.6
St. Paul, Minn.	57.5	Worcester, Mass.	127.2
Minneapolis, Minn.	58.5	Paterson, N. J.	133.4
Columbus, Ohio.	60.9	Providence, R. I.	150.8
Louisville, Ky.	63.9	Bridgeport, Conn.	156.1
Kansas City, Mo.	64.9	Nashville, Tenn.	156.2
Dayton, Ohio.	70.7	Atlanta, Ga.	168
Denver, Colo.	80.5	Jersey City, N. J.	169.4
Indianapolis, Ind.	84.7	Richmond, Va.	176.3
Toledo, Ohio.	86.6	Scranton, Pa.	178.2
Rochester, N. Y.	91.3	Lowell, Mass.	274.1
Memphis, Tenn.	101.1	Fall River, Mass.	376.5
Grand Rapids, Mich.	103.1		

It will be noted that the first 10 cities have rates below 90, and that every one of these is north of the thirty-eighth parallel of latitude and west of the eighty-third meridian.

It must not be inferred that the low rates in this area are entirely due to climatic influences. In most of these cities there is an absence of other factors, racial or economic, which play their part in the low rates.

On the other hand, favorable climatic conditions are not sufficient to prevent high rates in those northeastern cities, such as Fall River and Lowell, which possess the racial, social, or economic factors which make for high enteritis rates. In this class of cities (100,000 to 300,000) the eastern and southern cities, as shown above, have higher rates than those of the north and west, though probably for different reasons. The cities in the south have the climatic factor exaggerated greatly by the length of the summer and comparatively mild winters. The New England cities have high rates entirely independent of climate and depending in greatest measure upon certain economic conditions.

THE RACIAL FACTOR.

Racial characteristics are potent factors for good or ill in the prevention of infant mortality, although it is difficult to separate racial from economic influences. The pernicious effect of race is not because of the race itself but rather because the economic condition of the race is poor, and poverty and ignorance usually go hand in hand.

The southern cities suffer most from racial influences. The large negro population furnishes a very much higher rate per 100,000 for enteritis than the white population.

TABLE No. 6.—*Diarrhea and enteritis—Number of deaths per 100,000 population.*

Cities.	1906		1907		1908	
	White.	Colored.	White.	Colored.	White.	Colored.
Washington, D. C	98.4	216.1	88	227.1	94	202.5
Baltimore	123.1	172.9	143.3	224.1	122	153.8
New Orleans	161.4	218.7	176.8	229.4	166.3	239.8

These higher rates are due in greatest measure to the insanitary conditions under which the people live.

SOCIAL AND ECONOMIC CONDITIONS.

This includes the well-known influence of the slums of our large cities on infant mortality. It also includes the high mortality among children of working mothers in mill and factory towns. These conditions are due primarily to poverty and ignorance, and are accentuated in the foreign quarters and among the negro population. The rate to be expected from slum conditions should be in direct proportion to the size of the city. In this complex problem this is not always the case, as some of the small cities have high rates due to other causes than slums. In general, however, all cities in America of over 300,000 population have high rates. St. Louis, Mo., is the only exception.

TABLE No. 7.—*Enteritis, all ages, death rate per 100,000—Average for eight years, 1901 to 1908—Cities with populations of over 300,000.*

Cities.	Rate.	Cities.	Rate.
Pittsburgh	205.1	Chicago	135.4
New Orleans	177.4	Newark	134.7
New York	162.6	Milwaukee	128.5
Buffalo	155.2	Detroit	122.9
Philadelphia	144.7	Cincinnati	117.9
Baltimore	140.7	Boston	115.4
Cleveland	136.6	St. Louis	88.1
Washington	135.6		

The high rates in these large cities are not surprising. New York because of its size should head the list, but New York has a very good water supply, and must give place to Pittsburgh, which previous to 1908 had a grossly polluted water supply, and the southern city of New Orleans, where the racial and climatic factors are accentuated. Buffalo's rate is altogether too high considering its population, but Buffalo also has suffered from a polluted water supply.

The appalling infant mortality in certain manufacturing cities and towns, especially those dependent on the steel and allied industries, is probably due to a combination of racial and economic factors. There is a very large percentage of foreigners in these cities, and probably a very high birth rate. The insanitary conditions are said to be very apparent. A special study of infant mortality in this class of industrial city would be necessary to determine accurately the real causes of this frightful infant mortality.

It is unfortunate that in America we are unable to secure accurate infant mortality rates because of lack of registration of births. The rates per 100,000 population are not an accurate index of the real infant mortality. Neither is the percentage of infant to total deaths a reliable guide. The true index of infant mortality is the death rate per 1,000 births.

For this reason the very high rates per 100,000 population in a city with a large foreign population and consequently high birth rate might seem much less significant if we had the ratio of deaths under 1 year to each 1,000 births.

In spite of these disadvantages the death rate per 100,000 for diarrhea and enteritis is an index, if an imperfect one, of the infant mortality, and in most instances in this country must be employed for lack of a better criterion.

If we could eliminate the enteritis due to water we would have in these rates a very fair index of any city's sanitary condition. The city which is too small to have slums and which in spite of a good water supply has a very high enteritis rate has also in all probability insanitary conditions which are not essentially different from the slums of the large cities, at least in their effect upon infant mortality.

The enteritis rate for the smaller cities (less than 100,000) is even more accurate as an index of sanitary conditions, if we exclude water-borne enteritis. Table No. 8 shows the average rate for five years (1904–1908) for enteritis in cities with populations between 50,000 and 100,000. These may be divided conveniently into three classes: The first 15 have rates from 50 to 100; the second 15 have rates from 100 to 150; the third group of 13 have rates ranging from 164.7 in Schenectady, N. Y., to 342.3 in Charleston, S. C.

TABLE NO. 8.—*Enteritis, all ages—Death rate per 100,000 in cities with a population from 50,000 to 100,000.*

Cities.	Rate.	Cities.	Rate.
Canton, Ohio	50.9	Johnstown, Pa	122.6
Lincoln, Nebr	56.9	South Bend, Ind	128.7
Saginaw, Mich	59.6	Utica, N. Y	133.7
Covington, Ky	65.0	Allentown, Pa	134.9
Harrisburg, Pa	65.2	Mobile, Ala	135.8
Fort Wayne, Ind	72.2	Pawtucket, R. I	137.1
Somerville, Mass	75.9	Hoboken, N. J	145.7
Portland, Me	77.4	Wilkes-Barre, Pa	147.0
Evansville, Ind	82.3	Schenectady, N. Y	164.7
Springfield, Mass	87.6	Youngstown, Ohio	186.5
Altoona, Pa	91.6	Elizabeth, N. J	191.7
Lynn, Mass	94.4	Manchester, N. H	195.8
Springfield, Ill	95.3	Holyoke, Mass	199.8
Terre Haute, Ind	96.2	Yonkers, N. Y	207.7
Hartford, Conn	97.0	Waterbury, Conn	217.9
Duluth, Minn	103.1	Bayonne, N. J	224.9
Wilmington, Del	106.3	Passaic, N. J	230.7
Troy, N. Y	112.4	Lawrence, Mass	257.1
Camden, N. J	113.9	New Bedford, Mass	257.6
Erie, Pa	116.6	San Antonio, Tex	268.3
Savannah, Ga	119.0	Charleston, S. C	342.3
Reading, Pa	121.8		

The first group of 15 with rates below 100 contains no city south of the thirty-eighth parallel of latitude. Some eastern cities are in this group. They are not "mill" towns, however, but cities of quite a different type, as Somerville, Mass., Hartford, Conn., and Harrisburg, Pa.

The second group has cities from all sections. The rates 100 to 150 are too high for cities of this size, and an intensive study of conditions will show the special reason or reasons in each case.

Duluth's rate of 103 is higher than one would expect. St. Paul and Minneapolis have rates below 60; Duluth's rate should be no higher. There is no negro factor to raise the rate, but there is quite a large foreign population. South Bend, like Duluth, has very much higher rates than cities in the surrounding territory. Wilmington, Del., Savannah, Ga., and Mobile, Ala., have rates no higher than might be expected with the large negro population. The excessive rates in group 3 are best explained by the insanitary conditions, high birth rate, maternal neglect, ignorance, and poverty of mill and factory towns. The last two cities are southern cities, and probably find the explanation of their high rates in climatic and racial influences.

During an investigation of cities in the drainage basin of the Great Lakes the writer was struck with the high rates for diarrhea and enteritis in some northern cities coincident with polluted water supplies and an absence of slums. A close relation also seemed to exist between the rates for enteritis and typhoid fever. The following table shows 12 New York cities. The first four have good water supplies, good sanitary conditions, and low rates for both typhoid and enteritis. The second four have good water supplies, low typhoid rate, bad sanitary conditions (mill and factory towns), and high enteritis rates. The last group of four have polluted water supplies, fair to good sanitary conditions, high typhoid-fever rates, and high enteritis rates.

TABLE No. 9.—*Cities in New York State.*

Cities.	Typhoid-fever death rate per 100,000, average, 10 years, 1900–1909.	Character of water supply.	Death rate, enteritis—average for 5 years, 1904–1908.	Remarks.
Rochester	13.7	Good	89.5	Sanitary conditions good.
Syracuse	14.8	do	105.5	
Albany	21.9	do	80.0	
Binghamton	20.9	do	104.7	
Utica	17.3	do	133.7	Mill and factory towns.
Schenectady	22.4	do	164.7	
Amsterdam	18.6	do	150.7	
Yonkers	9.5	do	207.7	
Cohoes	83.8	Polluted	170.9	Mill town.
Niagara Falls	129.1	do	173.2	Sanitary conditions exclusive of water, good.
Ogdensburg	148.5	do	175.0	
Buffalo	27.0	do	151.6	

A similar relation between typhoid and enteritis was found in Michigan, although coincidently high rates were not always associated with a polluted water supply.

The Michigan rates are for diarrhea and enteritis under 2 years instead of for all ages.

TABLE No. 10.—*Michigan cities, population from 12,000 to 50,000—Deaths per 100,000, average for 6 years, 1905–1910.*

Cities.	Typhoid fever.	Enteritis.	Water supply.
Escanaba	136	185	Polluted.
Sault Ste. Marie	52.3	134.6	Good.
Alpena	46.7	162.6	Polluted.
Ironwood	43.5	124.5	Doubtful.
Port Huron	42	78.6	Polluted.
Flint	43	63	Do.
Traverse City	42	53.5	Do.
Bay City	37.3	56.3	Do.
Lansing	33.3	56.6	Good.
Battle Creek	31.3	44	Doubtful.
Kalamazoo	29.5	59	Good.
Jackson	28.3	45.5	Do.
Muskegon	24.7	59.8	Doubtful.
Saginaw	24.6	42	Wells safe; river polluted.
Pontiac	24.5	44	Good.
Ann Arbor	22.1	18.6	Do.
Manistee	20.8	48	Do.

This table shows that in every instance, except Traverse City, a typhoid-fever rate above 40 was accompanied by an enteritis rate above 60. This is a high rate for Michigan cities, considering climatic, racial, and social economic conditions, as this rate is for enteritis under 2 years only. On the other hand, the cities with good water supplies had low rates for typhoid fever and enteritis except Sault Ste. Marie, which will be referred to later.

It is probable that contamination of food and drink with human feces is a very great factor in the mortality ascribed to diarrhea and enteritis. When there is gross pollution of a public water supply, as at Niagara Falls or Escanaba, this contamination may be transmitted by water, but from experience with typhoid fever and cholera it may be assumed that this fecal contamination is very often effected independently of the water supply by dirty fingers, flies, and in other ways. The enteritis so transmitted would necessarily have its great-

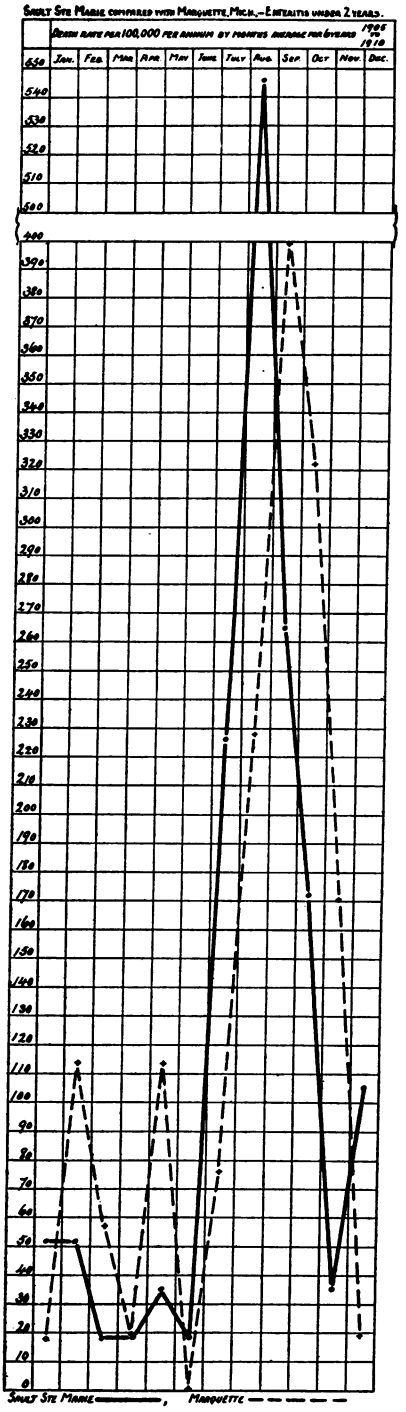
SAULT STE MARIE COMPARED WITH MARQUETTE, MICH. — ENTERITIS UNDER 2 YEARS.
DEATH RATE PER 100,000 PER ANNUM BY MONTHS AVERAGE FOR 6 YEARS 1905 TO 1910
Jan. Feb. Mar. Apr. May June July Aug. Sep. Oct. Nov. Dec.
650 540 530 520 510 500 400 390 380 370 360 350 340 330 320 310 300 290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
SAULT STE MARIE ———, MARQUETTE — — — —

Chart No. 5.

est prevalence in the hot months and its rate would be high in direct proportion to the insanitary surrounding of the victims.

Sault Ste. Marie has a very high rate for enteritis. The public water supply must be classed as good. As a consequence it is not strange that the winter and spring rate in Sault Ste. Marie is much lower than that of Marquette with its polluted water supply. Chart No. 5 shows the difference in the seasonal prevalence.

Ishpeming has a low typhoid-fever rate and a water supply which is probably safe. It has a very high death rate for diarrhea and

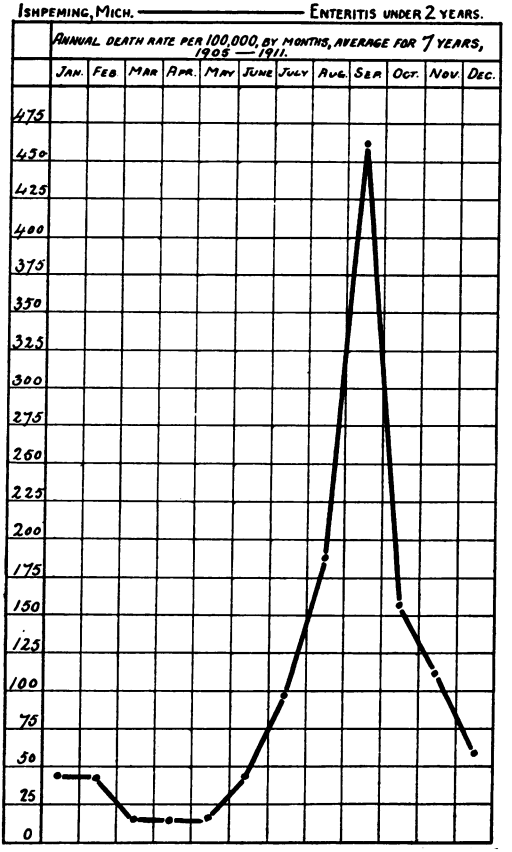

Chart No. 6.

enteritis. This is probably due to the insanitary conditions under which the foreign population lives. The greatest seasonal prevalence is in the summer and autumn months with practically no deaths in the winter and spring months. Chart No. 6 shows the seasonal prevalence in Ishpeming.

The factors operating in the summer months—flies, fingers, careless disposal of excreta, bad personal hygiene—are scarcely separable from the other factors associated with poverty and ignorance, including maternal neglect.

From a study of statistics and conditions in cities and towns in the drainage basin of the Great Lakes, the writer is inclined to believe

that the reduction in the general death rate coincident with and following improvement in the water supply independent of typhoid reduction, is largely due to the reduction effected in the group of entities classified as diarrhea and enteritis.

THE RELATION OF POLLUTED WATER SUPPLIES TO THE SO-CALLED DIARRHEA AND ENTERITIS OF CHILDREN.

In attempting to estimate the importance of water in the prevalence of diarrhea and enteritis it will be necessary to consider the deaths by months. This disease, or group of diseases, if not water borne, has a relatively low prevalence in the winter and spring months. This point is well illustrated by the seasonal prevalence in cities with good water supplies. In dealing with seasonal prevalence the climatic factor is very prominent. For this reason it would be manifestly unfair to compare southern with northern cities. In the following consideration of enteritis the writer will confine himself to cities north of the thirty-ninth parallel and east of the Mississippi River.

In cities with good public water supplies the seasonal prevalence of the diarrhea and enteritis of children is uniform, and Chart No. 7 illustrates this seasonal prevalence in the city of New York. If the public water supply is not a factor, the greatest number of deaths should occur in July and August.

TABLE No. 11.—*Cities having a population of over 250,000 and enteritis rates above 100 per 100,000.*

Cities.	Enteritis under 2 years—annual death rate per 100,000.			Ratio of summer to winter enteritis.	Character of water supply.
	Entire year, 1910.	Summer, June to November, 1910.	Winter, December to May, 1910.		
Jersey City, N. J.	146	259	37	7 to 1	Safe.
Detroit, Mich.	123	212	34	6.2 to 1	Doubtful; exposed to pollution.
Boston, Mass.	100	172	32	5.3 to 1	Good.
Newark, N. J.	113	189	42	4.4 to 1	Do.
New York, N. Y.	123	198	46	4.3 to 1	Do.
Buffalo, N. Y.	132	209	53	3.9 to 1	Polluted at times.
Pittsburgh, Pa.	179	277	77	3.6 to 1	One-fourth of the population uses unfiltered water.
Cleveland, Ohio.	169	261	73	3.5 to 1	Polluted at times.
Philadelphia, Pa.	150	241	70	3.4 to 1	A portion of the city uses unfiltered polluted water.
Chicago, Ill.	159	248	102	2.4 to 1	Polluted.
Milwaukee, Wis.	117	147	89	1.6 to 1	Do.

A study of the statistics of cities with good water supplies and fairly high enteritis rates brings out an interesting phenomenon. The mean annual enteritis death rate per 100,000 for the months of June, July, August, September, October, and November bears a definite relation to the rate for December, January, February, March, April, and May. This will be referred to as the ratio between the summer and winter enteritis rates. If very low annual rates for enteritis prevail, this relation is disturbed; but if the rates are above the normal, even if very excessive, as in some mill towns, the ratio is preserved, provided the public water supply is not polluted.

In large cities with enteritis rate per 100,000 of more than 100 for the entire year the ratio of summer to winter enteritis should be not less than 4 to 1, provided the public water supply is not grossly polluted.

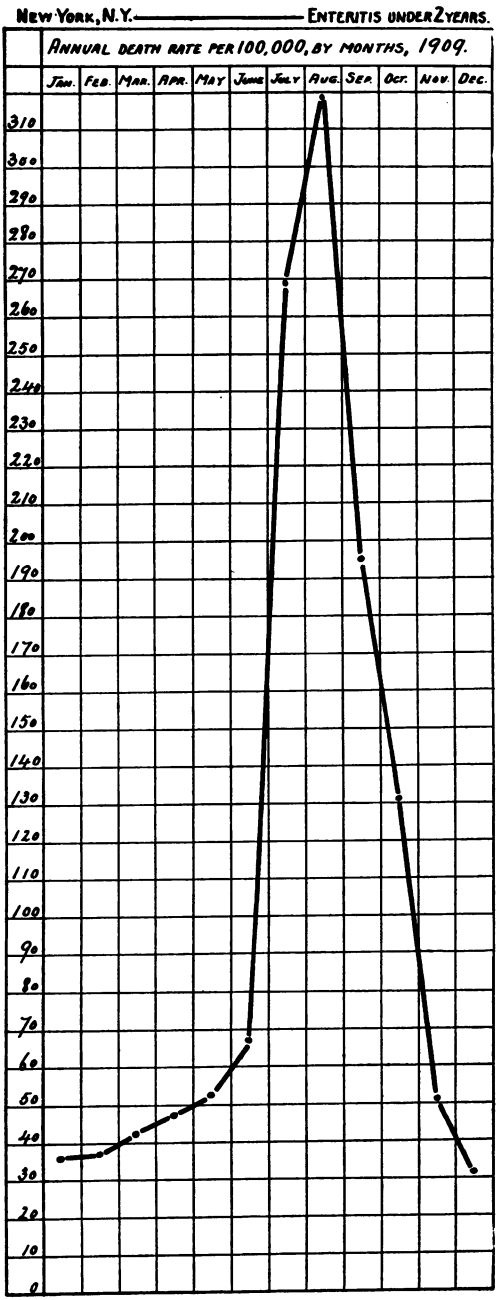
NEW YORK, N.Y. — ENTERITIS UNDER 2 YEARS.
ANNUAL DEATH RATE PER 100,000, BY MONTHS, 1909.
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEP. OCT. NOV. DEC.
310
300
290
280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0

Chart No. 7.

TABLE No. 12.—*Cities having populations from 100,000 to 250,000 and enteritis rates above 90 per 100,000.*

Cities.	Death rate per 100,000; enteritis under 2 years, 1910.	Ratio of summer to winter enteritis.	Cities.	Death rate per 100,000; enteritis under 2 years. 1910.	Ratio of summer to winter enteritis.
Paterson, N. J	117.3	8.8 to 1	Cambridge, Mass	94.2	6.0 to 1
Worcester, Mass	134.3	7.9 to 1	Rochester, N. Y	99.7	5.4 to 1
Fall River, Mass	373.8	7.3 to 1	Grand Rapids, Mich	95.4	5.7 to 1
Scranton, Pa	230.8	7.3 to 1	Bridgeport, Conn	123.7	4.7 to 1
Lowell, Mass	252.0	6.9 to 1	Syracuse, N. Y	122.4	3.7 to 1
Dayton, Ohio	91.6	6.6 to 1			

TABLE No. 13.—*Cities in the State of New York.*

Cities.	Enteritis under 2 years, death rate per 100,000, average for 3 years, 1908-1910.		Ratio of summer to winter diarrhea.	Character of water supply.
	Summer, June to November.	Winter, December to May.		
Amsterdam	342	27	12.5 to 1	Good.
Utica	254	29	8.7 to 1	Do.
Troy	169	21	8.0 to 1	Do.
Binghamton	162	21	7.7 to 1	Safe.
Schenectady	229	34	6.7 to 1	Good.
Syracuse	207	31	6.6 to 1	Do.
Rochester	152	26	5.8 to 1	Do.
Albany	95	19	5.0 to 1	Do.
New York	208	44	4.7 to 1	Do.
Yonkers	337	74	4.5 to 1	Do.
Buffalo	106	29	3.6 to 1	Polluted.
Niagara Falls	191	93	2.0 to 1	Grossly polluted.
Cohoes	221	133	1.6 to 1	Do.

It is clear also that no deduction regarding the part played by water can be drawn safely from high rates in winter months alone unless these rates are more than one-fourth of the rates for the summer months. For example, high rates in Yonkers or Amsterdam in December, January, February, March, April, and May do not necessarily indicate polluted water, in view of the fact that the summer rates are very high and more than four times those of the winter months.

High rates in the winter months with relatively low rates in the summer months, as in Cohoes and Niagara Falls, leave no escape from the conviction that the polluted water supply is a big factor in this mortality. In the territory north of the thirty-eighth parallel and east of the Rocky Mountains there is no factor in the transmission of intestinal diseases except water, which operates consistently with greatest intensity from December to May.

The possibility of milk causing outbreaks of intestinal diseases in winter or spring months is admitted, but milk is unlikely to operate with greater intensity in winter consistently for a number of years.

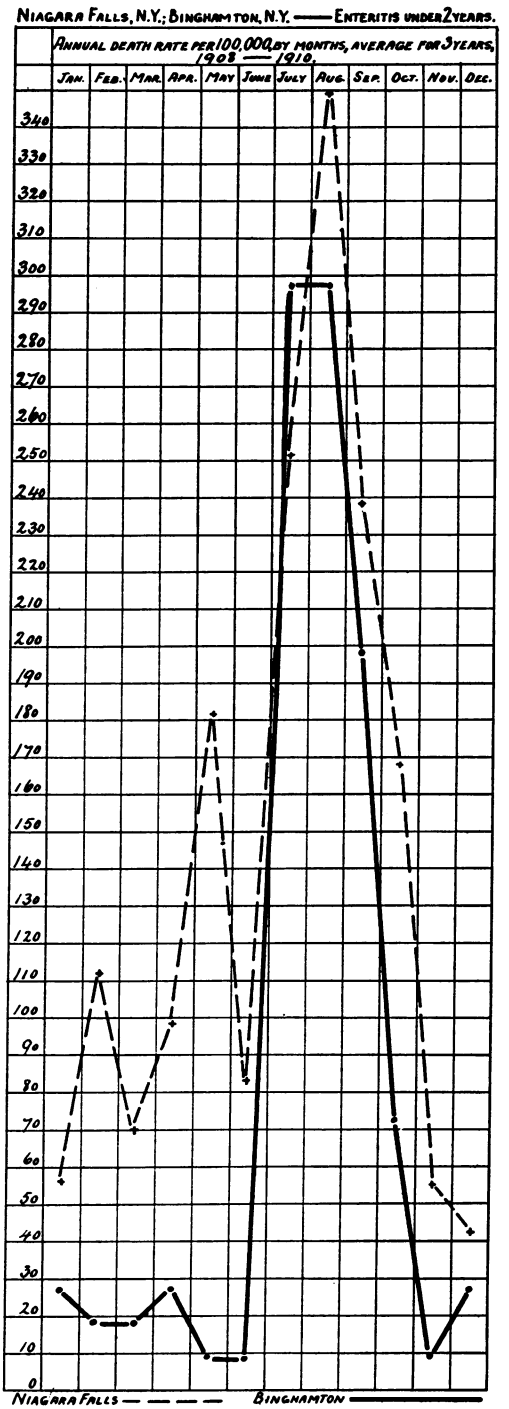
NIAGARA FALLS, N.Y.; BINGHAMTON, N.Y. —— ENTERITIS UNDER 2 YEARS.
ANNUAL DEATH RATE PER 100,000, BY MONTHS, AVERAGE FOR 3 YEARS, 1908 — 1910.
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEP. OCT. NOV. DEC.
340 330 320 310 300 290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
NIAGARA FALLS — — — — BINGHAMTON ——

Chart No. 8.

TABLE No. 14.—*Cities in the State of Michigan.*

Cities.	Enteritis under two years, death rate per 100,000, average for six years, 1905 to 1910.		Ratio of summer to winter enteritis.	Character of water supply.
	Summer—June to November.	Winter—December to May.		
Battle Creek	77	9	8.5 to 1	Fair.
Jackson	89	11	8 to 1	Pure.
Flint	111	15	7.4 to 1	Wells pure; river polluted.
Lansing	96	14	6.8 to 1	Good.
Sault Ste. Marie	278	43	6.4 to 1	Do.
Bay City	101	16	6.3 to 1	Doubtful.
Grand Rapids	140	27.2	5.1 to 1	Do.
Port Huron	135	33	4 to 1	Polluted.
Marquette	199	57	3.4 to 1	Do.
Alpena	257	91	2.8 to 1	Do.
Escanaba	209	168	1.2 to 1	Grossly polluted.

In Michigan it is probable that the summer enteritis rate should be more than four times the winter rate. The three cities which fall below the ratio of 4 to 1 all have polluted water supplies, and this is also true of Grand Rapids and Port Huron, the next on the list.

Chart No. 8 shows the seasonal prevalence in Niagara Falls, compared with Binghamton, N. Y. Niagara Falls has a grossly polluted water supply, while Binghamton has a safe one.

Chart No. 9 shows Cohoes compared with Amsterdam. Cohoes has a grossly polluted water supply, while Amsterdam's supply is rated as good. Amsterdam has a very much higher rate in July, August, and September than Cohoes, and if no water factor entered into the problem should have the higher rate in the winter and spring months. The high rate in Cohoes for December, January, and February is very striking.

Chart No. 10 shows Marquette, Mich., compared with the normal curve for the State of Michigan. The sharp rises in February and May are noticeable. Marquette has had a very high typhoid rate and the water supply has been grossly polluted at times.

Chart No. 11 shows Buffalo, N. Y., compared with Washington, D. C. Buffalo has a polluted water supply. Washington has a safe water supply. Buffalo has a lower rate than Washington in the summer and should have a lower winter rate if water was not a factor. The high rates in March, April, and May in Buffalo are well shown on the chart.

Chart No. 12 compares Chicago and New York. The Chicago rates are abnormally high from January to June and a distinct peak is noticeable in March.

Chart No. 13 shows Milwaukee compared with Jersey City. Milwaukee has a sewage-polluted water supply while Jersey City's supply is safe. The abnormal peak in March and the very high rates in March and April are very striking and suggestive. Jersey City, with its very high rate in July, August, and September, would have a higher rate than Milwaukee during the winter months if the winter rates depended upon other factors than water.

Chart 14 shows Cleveland compared with Jersey City. Cleveland has had a polluted water supply in the winter and spring months.

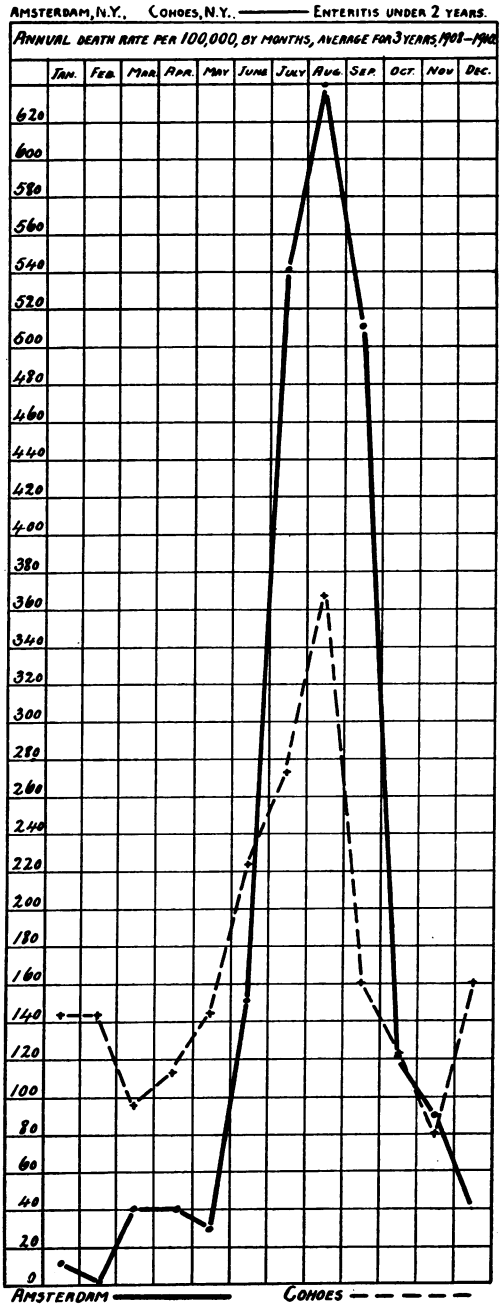
AMSTERDAM, N.Y., COHOES, N.Y. —— ENTERITIS UNDER 2 YEARS.
ANNUAL DEATH RATE PER 100,000, BY MONTHS, AVERAGE FOR 3 YEARS, 1908–1910.
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEP. OCT. NOV DEC.
620
600
580
560
540
520
500
480
460
440
420
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
AMSTERDAM
COHOES

Chart No. 9.

The high rates in the first half of the year and the sharp rise in March are remarkable. Compare this March rise with that of Chicago and Milwaukee in the same months. (Chart No. 15.) The similarity is striking, in view of the similarity in the character of their water supplies.

Chart 16 shows the average rate for six years in the city of Alpena compared with the rate for the entire State of Michigan. Not only is the annual rate for Alpena excessive, but the very high rates in the first half of the year and especially the peak for May are noticeable

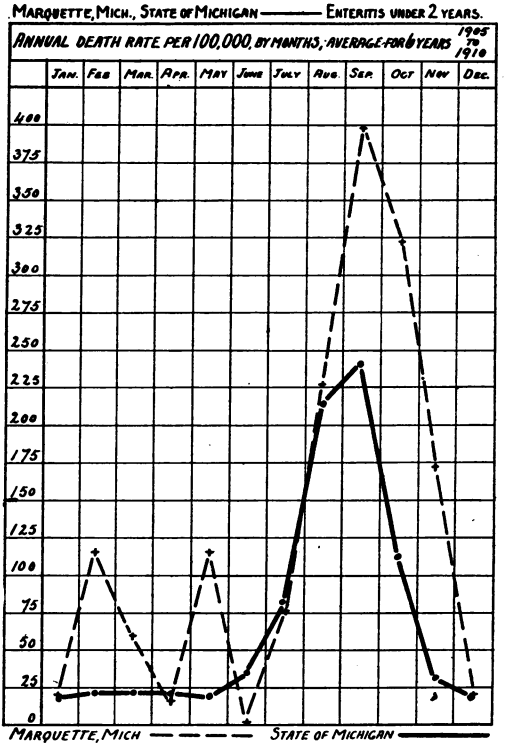

Chart No. 10.

features of this chart. Alpena uses an unfiltered and polluted water supply.

Chart 17 shows the average rate for diarrhea and enteritis in Escanaba, Mich., for six years by months. The chart speaks for itself. Escanaba has been notorious for its polluted water supply and outbreaks of "winter cholera" and typhoid fever.

In 1910 a mechanical filter plant was in operation in Escanaba. Its operation was not entirely satisfactory, but it seemed to have a marked effect upon the typhoid-fever rate and winter enteritis of children in the winter and spring of 1910.

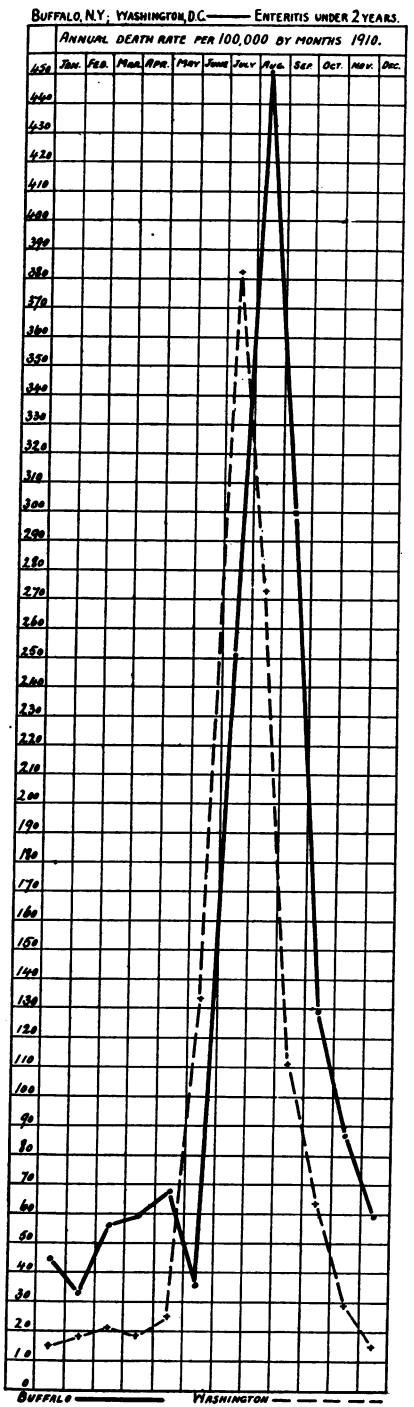

Chart No. 11.

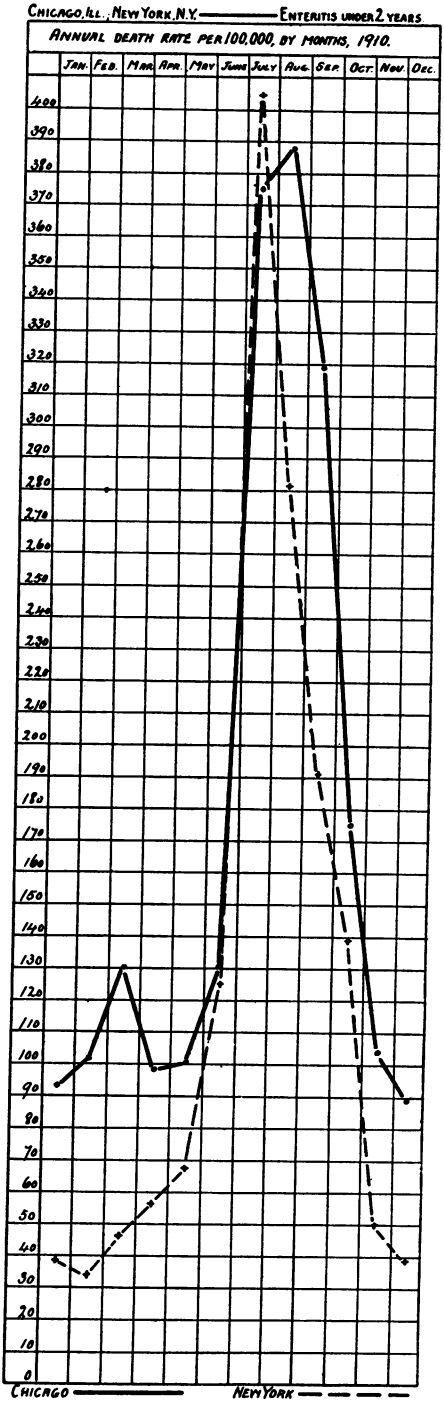

Chart No. 12.

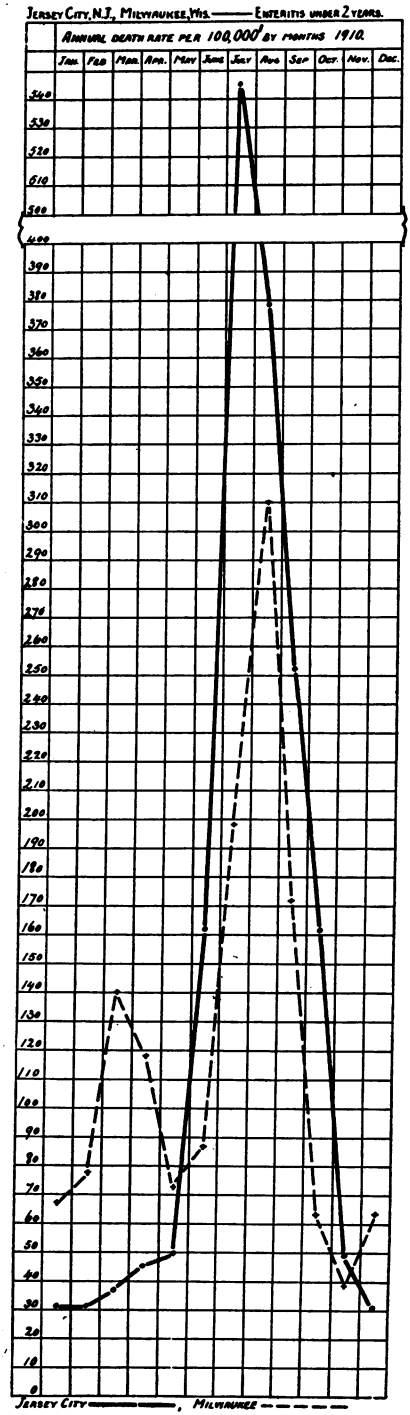

Chart No. 13.

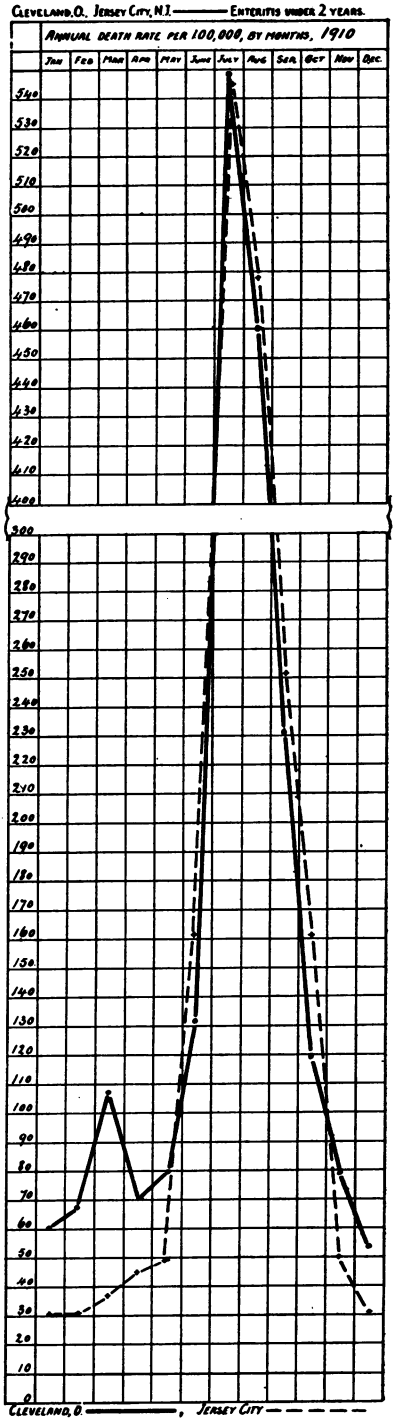

Chart No. 14.

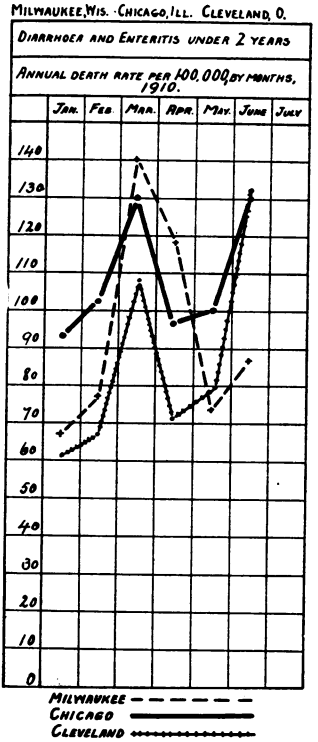

Chart No. 15.

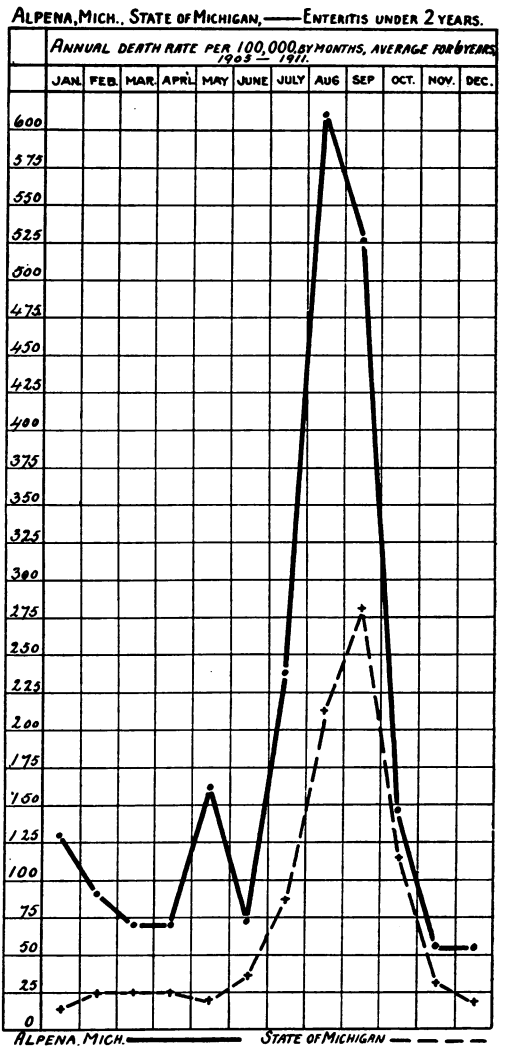

Chart No. 16.

The following table shows the reductions which occurred in the general death rate, the typhoid rate, and the enteritis rate in 1910, following the use of filtered water.

TABLE NO. 15.—*Escanaba, Mich.*

Year.	Death rate per 1,000 inhabitants.	Total deaths.	Typhoid-fever deaths.	Enteritis under 2 years; deaths January to June.
1908.....	18	228	12	7
1909.....	16.8	213	28	7
1910.....	15.5	206	8	1

THE RELATION OF TYPHOID FEVER TO DIARRHEA AND ENTERITIS.

There is a close relation between the curves for typhoid fever and diarrhea and enteritis in many cities, especially in the winter and spring months. This relation is usually disturbed by the sudden rise of the enteritis curve in June or July while the typhoid rise is usually a month later, and not so high.

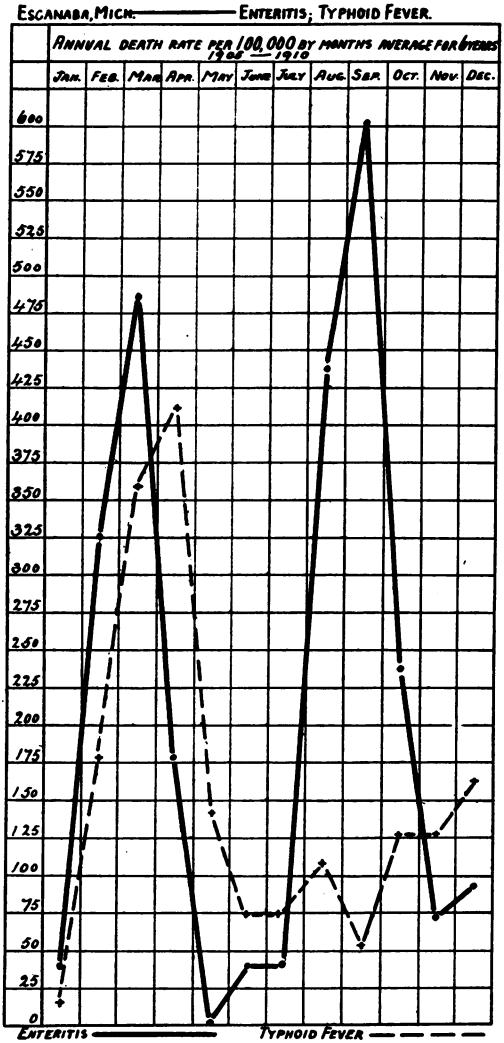

Chart No. 17.

Chart No. 17 shows the relation between the curves for enteritis and typhoid fever by months in Escanaba, Mich., taking an average for six years. Note the abnormally high peaks for both diseases in the spring months and that the spring speak for typhoid is one month later than the pronounced enteritis peak in March. Chart No. 18 shows the curves for typhoid and enteritis compared in Washington,

D. C. Washington has a safe water supply and the rates from January to June for both enteritis and typhoid are low. The close relation between the two curves is apparent.

Chart No. 19 shows the same comparison made in Battle Creek, Mich. Battle Creek's water supply is not above suspicion. Enteritis

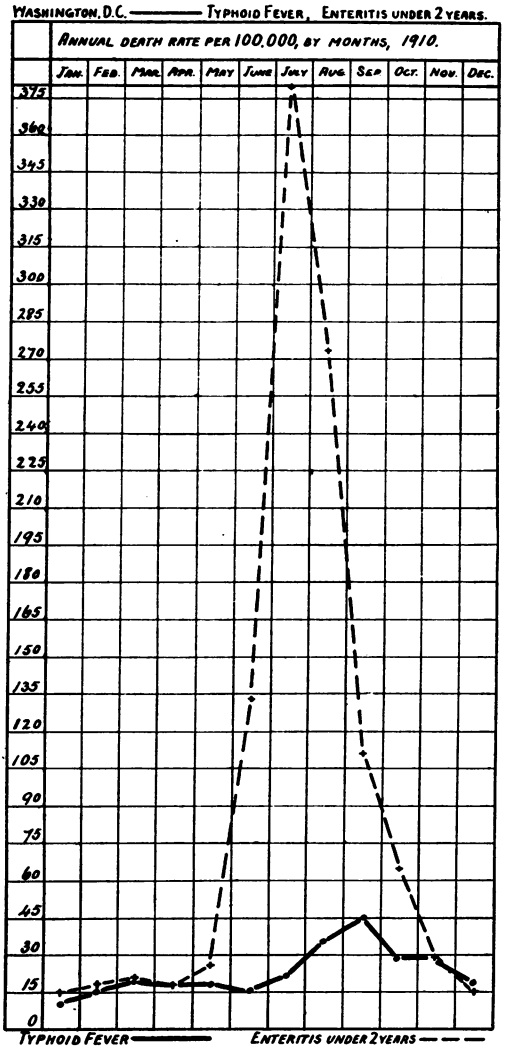

Chart No. 18.

and typhoid fever show synchronous peaks in the curve in January and March.

Pittsburgh in 1910 had a high typhoid-fever rate in the months from January to June. It also had an abnormally high enteritis rate for the same period and a very pronounced peak in March. This relation is shown in chart No. 20.

Milwaukee in 1910 had an unusually high typhoid-fever rate from January to June. The enteritis rate was also very high considering the season, with a pronounced peak in March. Chart No. 21 shows the typhoid and enteritis curves compared in Milwaukee.

Chart No. 22 shows the relation between these curves in Cleveland. The winter and spring typhoid in Cleveland shows a peak in April. The enteritis curve shows a marked rise one month earlier, in March.

Cohoes is another example of very high rates for both typhoid and enteritis in the winter and spring. Chart No. 23 shows the relation between the curves. In addition to the high rates in January, February, March, and April the coincident rise in both curves in December is notable.

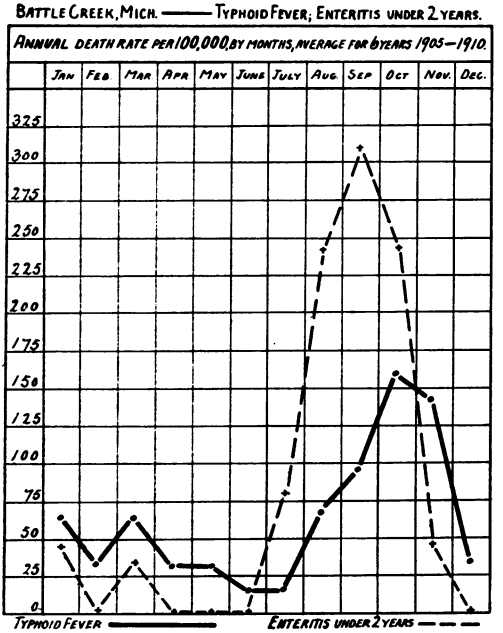

Chart No. 19.

Chart No. 24 shows the curves for typhoid fever and enteritis compared in Niagara Falls. The winter peak for typhoid is pronounced and one month later than the peak for enteritis. On the other hand the rise in May is synchronous and the two curves drop almost together in June.

The relation between enteritis in children and typhoid fever can not be said to be clear. Certain facts, however, stand out prominently in studying the statistics. In cities which are too small to have slums and which have abnormally high typhoid-fever rates there is also an excessive mortality from enteritis and diarrhea in children under 2 years of age. Cities of the same class with low typhoid rates have comparatively low rates for enteritis and diarrhea of children.

The seasonal prevalence also closely follows that of typhoid. If the excessive typhoid in these cities is due to water then we have a high enteritis rate, not only in the summer and autumn, but also in

the winter and spring months. If the typhoid is independent of the water supply, then the enteritis rate like that of typhoid, will be high in the regular season from July to October and low during the remainder of the year.

The effect of polluted water upon young infants may be indirect as well as direct. The polluted water may be used to dilute milk, to wash milk bottles, or directly as a beverage. Further, the polluted water supply, which causes numerous typhoid cases in cities or towns,

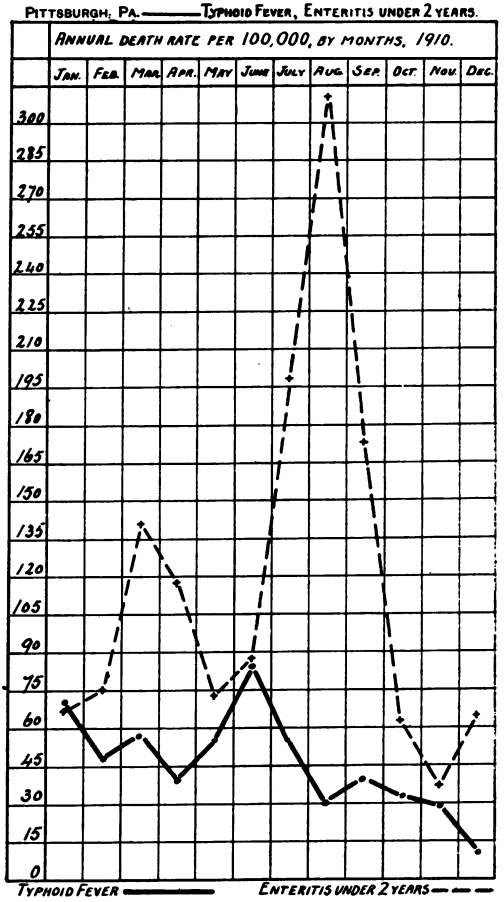

Chart No. 20.

is responsible indirectly for the contact infections in children resulting from such cases. That many of these occur in children can scarcely be doubted, even if they remain undiagnosed as typhoid and enter the statistics as diarrhea or enteritis.

The idea that typhoid fever is not a disease of childhood lacks satisfactory evidence to support it. The mere fact that the bulk of the reported cases is made up of adults is not proof. The writer's experience with cholera,[1] an analogous disease epidemiologically, suggests

[1] McLaughlin, Allan J., "Some observations upon cholera in children," Philippine Journal of Science, sec. B, 1909, vol. 4, p. 363.

that typhoid, like cholera, may be much more frequent in children than popularly supposed, and that a tendency to light or atypical symptoms in children may be expected.

Mere parallelism does not indicate identity of causation. It indicates rather similar modes of transmission and, possibly, identity in a portion of the cases.

Often the unusual prevalence in winter and spring, instead of showing parallelism between the curves, shows that the typhoid peak is

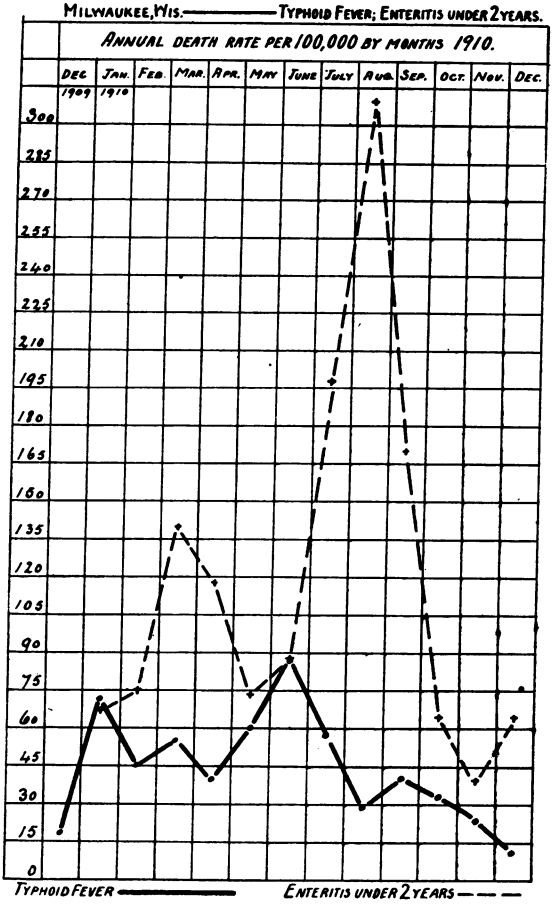

Chart No. 21.

one month later than the peak for enteritis. This same peculiarity is noticeable in the outbreaks of the so-called "winter cholera." After a gross pollution of the water supply by sewage, there follows a sudden massive outbreak of "winter cholera."

This is usually followed about one month later by a typhoid outbreak. The exact causation of winter cholera is obscure. It has nothing to do with season, however, and one of the best examples of this disease occurred at Mackinac Island in August. Whatever the real relation between typhoid fever and enteritis or diarrhea of children may be, one fact is clear, that the same causes operate to cause

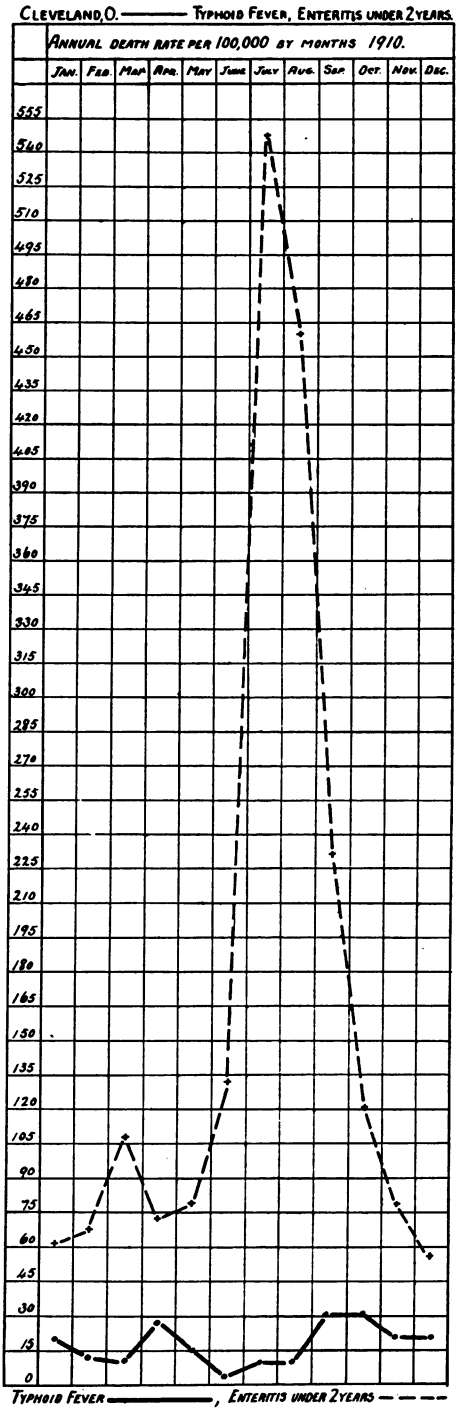
CLEVELAND, O. ——— TYPHOID FEVER, ENTERITIS UNDER 2 YEARS.
ANNUAL DEATH RATE PER 100,000 BY MONTHS 1910.
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEP. OCT. NOV. DEC.
555
540
525
510
495
480
465
450
435
420
405
390
375
360
345
330
315
300
285
270
255
240
225
210
195
180
165
150
135
120
105
90
75
60
45
30
15
0
TYPHOID FEVER ———, ENTERITIS UNDER 2 YEARS — — —

Chart No. 22.

excessive prevalence in both. It is probable that cases of typhoid in children under 2 years in many cities are often diagnosed as enteritis. It must be remembered, however, that the causative agent of bacillary dysentery is transmitted in the same way and by the same media as that of typhoid. There are too many cases of fatal illness in children under 2 years classed as diarrhea and enteritis, and an exhaustive

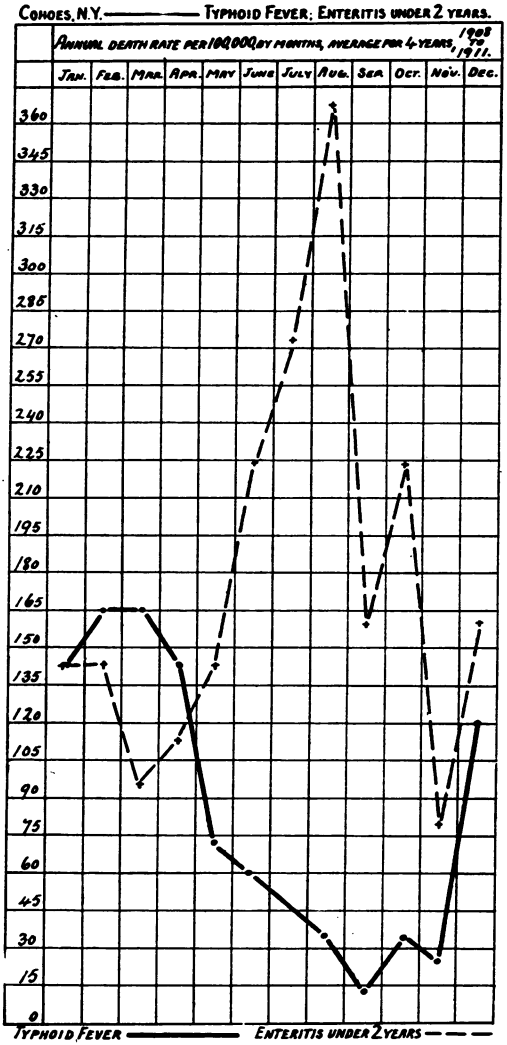

Chart No. 23.

investigation should be made to establish the real cause of death in enteritis and diarrhea of children. Without such an investigation it is impossible to assign the real cause of the excessive child mortality from diarrhea and enteritis. In cities of less than 50,000 population without slums and which are not "mill" towns an enteritis rate in children under 2 years above 100 deaths per 100,000 indicates prevalence of an acute intestinal disease preventable by the same measures

which prevent typhoid fever. It is probable that in such cities proper enforcement of prophylactic measures against typhoid fever would reduce the enteritis rate below 40 deaths per 100,000. Enforcement of prophylactic measures would include the installation of pure water supplies and proper sewerage systems, coupled with a vigorous campaign against the insanitary outdoor privy and the dangerous shallow well.

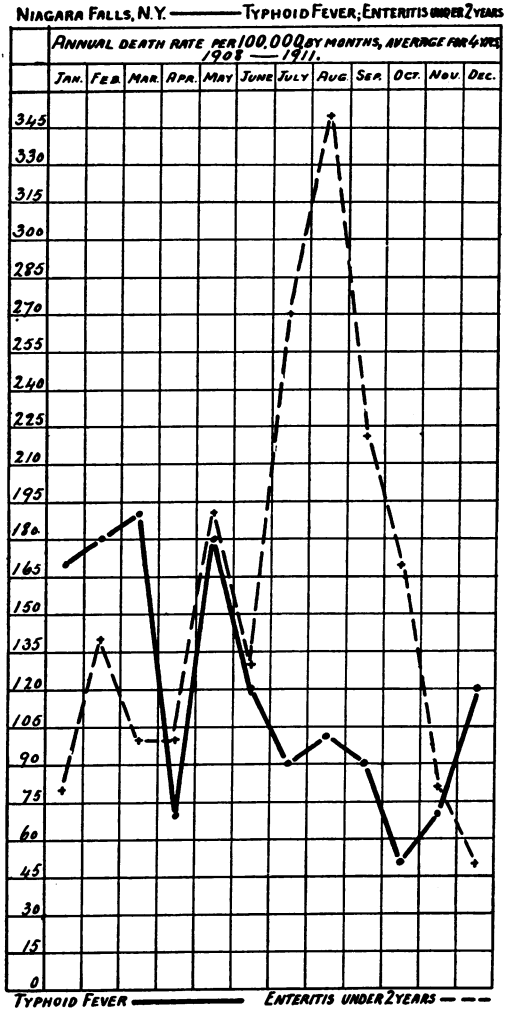

Chart No. 24.

CONCLUSIONS.

1. From a study of a considerable number of cities it seems probable that the reduction in the general death rate which has been called the Mills-Reincke phenomenon, when present, is due in greatest measure to the reduction in those diseases which are grouped under the heading of diarrhea and enteritis of children.

2. The Mills-Reincke phenomenon and Hazen's theorem are not always apparent after betterment of the public water supply because

of wide fluctuations in the death rates for contagious diseases which are not water borne.

3. Because of the reducing influence on death rates of the campaign against tuberculosis, the improvement in control of milk supplies, the use of diphtheria antitoxin, education of the public in personal hygiene, and the prevention of disease it is difficult to say in some instances to what extent an improved water supply is a factor in the reduction of the general death rate.

It is certain, however, that in practically every instance, in addition to a lessened number of deaths from typhoid fever, the substitution of a safe for a polluted public water supply results in the saving of many lives from diseases which are not reported as typhoid fever.

The question of the identity of these diseases can be answered only after an exhaustive investigation of deaths, and especially of that group of entities which is now reported under the heading of "Diarrhea and enteritis under 2 years."

4. Enteritis or diarrhea in children as a fatal disease may be expected to be excessively prevalent in large cities with slum districts and a large foreign population. The same excessive prevalence may be expected in so-called mill towns, where the mothers are operators in the mills and child neglect is common. Under these conditions the mortality among poor children is very great, but it is almost entirely in the period from July to October, provided the public water supply is safe.

5. In cities with safe water supplies and enteritis rates above the average for the State the ratio of summer and autumn to winter and spring enteritis should be at least 4 to 1, taking the months of June, July, August, September, October, and November for the summer and autumn enteritis, and the months of December, January, February, March, April, and May for the winter and spring enteritis.

6. Cities with grossly polluted water supplies often have a winter and spring enteritis which is more than one-fourth of the summer and autumn enteritis. If such a phenomenon is present each year for several years, it suggests that the polluted water supply is a factor in the enteritis mortality in winter and spring.

7. The relation between typhoid fever and the diarrhea and enteritis of children is not clear. There is often a striking parallelism in seasonal prevalence between the curves, but mere parallelism does not necessarily indicate identity. It may and usually does mean similarity in modes of transmission. Often in the winter and spring months there is a sharp rise in both diseases, the typhoid peak being one month later than that of diarrhea and enteritis.

Cities without slums and with good sanitary conditions except grossly polluted water supplies have excessively high rates for both typhoid fever and diarrhea and enteritis in the winter and spring months. Cities with good water supplies and low typhoid-fever rates may have high rates for diarrhea and enteritis under 2 years, but the rates in winter and spring will be relatively low.

8. Closer cooperation between the practicing physician and the local health departments is necessary in order to carry out an investigation of the true nature of the diarrhea and enteritis in children under 2 years, now classified as diarrhea and enteritis.

9. There should be a wider employment of municipal laboratories by practicing physicians, especially in the diagnosis of typhoid fever and examination of the discharges of sick children.

UNITED STATES.

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

[Adopted since July 1, 1911.]

COLUMBUS, OHIO.

MILK—APPLICATION FOR PERMIT TO SELL.

SEC. 3. (Application for permits.) All applications for permits shall be signed by the applicant, and when received by the dairy inspector shall be placed on file, and the name of such applicant shall be entered in a book of registration kept for such purpose. As soon as possible after an application is received at the health office for a permit to sell milk, the dairy inspector shall visit the dairy or place of business of such applicant, and make such observation and gather such information as will enable the board to properly consider such application. Should the dairy or place of business of such applicant be located more than 80 miles from the city of Columbus he shall either furnish a certificate of qualification of all dairies from which it is proposed milk be obtained, according to the requirements of the sanitary code, made by some State or municipal sanitary authority, acceptable to the board, or pay the cost and expense of making such inspection by the health department; and for such purpose there shall be deposited by said applicant with the clerk of the board an amount sufficient to cover the estimated cost of such inspection, based upon a compensation to the inspector of $4 per day and the necessary expenses of the inspector in going to and from the place of inspection and while engaged therein; any surplus of said deposit not required for said purposes to be returned to the applicant when the permit is issued; and any deficiency in such amount to be paid by said applicant when the permit is issued.

[Sec 3, Part III, title 1 of the sanitary code as amended Nov. 14, 1911.]

JACKSON, TENN.

MILK—PRODUCTION, CARE, AND SALE.

SECTION 1. No person, firm, or corporation shall produce for sale, sell, offer for sale, or have in his or their charge, custody, or control for sale or distribution within the city of Jackson any milk, cream, or buttermilk without first obtaining a permit from the board of health to conduct such business or distribution, under penalty as hereinafter provided.

SEC. 2. All persons, firms, corporations, or others offering for sale milk, cream, or buttermilk shall apply for and obtain from the board of health a permit for such purpose, and shall at all times keep such permit conspicuously displayed in their place of business.

SEC. 3. All permits for the sale of milk, cream, or buttermilk shall be renewed on or before the 20th day of January of each year, and for each milk permit thus issued the board of health shall collect before issuing such permit a fee of $1, acknowledgment of the receipt of which shall appear upon the face of said permit when issued.

All permits thus issued or renewed shall be good and in force until the 20th day of January next ensuing. Permits thus issued are not transferable by reason of sale or transfer of business nor is any of the said fee to be refunded by reason of cessation of sale of milk or of any of its products prior to termination of period for which said permit is issued.

All fees thus collected by the board of health for the issuance of such permits shall be paid monthly by the said board of health to the city recorder, and his receipt for same shall be a voucher for the payment of such to the city.

SEC. 4. All milk wagons or other vehicles used for the purpose of vending milk shall have painted thereon legibly the name of the owner in letters not less than 3 inches in

height and shall have placed on each side of wagon or other vehicle used for the purpose of vending milk the license plate of the board of health.

SEC. 5. *Revoking of permit.*—If at any time after the granting of a permit as above provided, the holder fails to comply with the sanitary requirements of the board of health or repeatedly sells or offers for sale milk below standard or otherwise adulterated within the meaning of the ordinances of the city of Jackson or in violation of this ordinance or any of the provisions thereof, the board of health shall revoke his or their permit, with or without notice, and no liability shall attach to the city of Jackson or to any officer of the board of health by reason of such revocation nor shall the city be required to refund any money for the unexpired term of any such permit. The president of the board of health may grant the defendant a hearing if he deems this necessary.

SEC. 6. *Reissuing of revoked permit.*—If, after the revocation of a permit, the defendant complies with the requirements of the board of health and makes manifest his intention to meet them in the future, the president of the board of health may, at his discretion, recommend that the permit be reissued.

SEC. 7. *Publishing standing of dairymen and milk dealers.*—It shall be the duty of the board of health to publish from time to time in the daily newspapers of the city of Jackson the names, score condition of equipment, methods, sanitary condition, and such other data as they may think proper to inform the consuming public of the standing and efficiency of every dealer in milk in the city of Jackson.

SEC. 8. No person, firm, or corporation shall have for sale, sell, offer for sale, or have in his or their charge, custody, or control for sale or distribution within the city of Jackson any unwholesome, watered, or adulterated milk, or milk known as swill milk, or milk which has been transported or stored in an unclean manner, or milk which contains preservatives or coloring matter, or milk which is produced from cows which are kept or stabled under unhealthy conditions, or which may be diseased, or when drawn from animals three weeks before or after parturition.

SEC. 9. All milk sold or offered for sale in this city shall be the pure, unadulterated product of healthy milch cows, and all milk sold or offered for sale in this city shall contain not less than 3½ per cent of milk fats nor less than 12½ per cent of natural milk solids, viz, fat, casein, milk sugar, and ash, and not more than 87½ per cent of water, and the specific gravity at 60° F. shall not be lower than 1.029 or higher than 1.034. All milk which shall be below such standard shall be deemed and conclusively held to be impure and adulterated, and if any person shall sell or have for sale milk of a quality below the standard herein established, they shall, upon conviction thereof, be fined not less than $5 nor more than $25 for each offense, and upon a second conviction the board of health is hereby empowered to cancel permit held by person or persons thus convicted.

It is further provided that the foregoing shall not be construed to prohibit the sale of buttermilk or skim milk as such, but it is hereby provided that any person or persons selling or having for sale "skim milk" (milk deprived of all or a part of its cream) shall have the can or vessel containing the same labeled prominently and conspicuously, in plain letters not less than 3 inches in height, with the words "skim milk."

SEC. 10. Any person engaged in the sale of milk shall furnish forthwith, when requested to do so by the board of health or any officer or inspector thereof, a true statement in writing, upon blanks to be provided by the board of health, setting forth the locality from which the milk was procured, also a complete and full list of the persons from which said milk was purchased. Said written statement shall be signed by the person or persons selling the said milk.

SEC. 11. No milk, cream, or butter milk shall be sold or exposed for sale in the city of Jackson except from cows stabled under light, dry, and well-ventilated conditions, and in all other respects conforming to the requirements set forth in the following rules:

RULE 1. *Milk depots and dairies.*—By a "milk depot" is meant any place, house, or room where milk is received from the dairy or dairies, and includes all ice-cream factories, and prepared for distribution. By a "dairy" is meant any place where cattle are kept for the production of milk.

RULE 2. *Where to be established.*—No milk depot shall be established or maintained in a room or rooms which communicate directly with any living rooms, kitchen, toilet, laundry, or stable or places where animals are kept or slaughtered. No milk depot shall be maintained which communicates in any way with a horse or cow barn, and shall be separated therefrom by an air and odor proof partition or wall. The immediate vicinity of the milk depot, especially within 25 feet of the doors and windows thereof, shall be kept free from accumulations of rubbish, garbage, manure, and any other putrefying, decomposing, infectious, and bad-smelling substances.

No dairy shall be established or maintained in insanitary surroundings where it is designed to offer such milk to the citizens of Jackson. Insanitary conditions will be

deemed to exist whenever and wherever properly constructed barns, milk rooms, and utensils are not provided; where the cattle are dirty, unhealthy, crowded, fed distillery waste, slop, or other food forbidden by the ordinances of the city of Jackson; where the utensils are not kept clean; where the premises are not kept clean; where the udders of all cows are not washed in clean water and dried with clean cloths prior to milking; where the attendants do not wash and put on a clean outer garment prior to milking; where the milk is not immediately removed from the barn to the milk room immediately after milking each cow, and there promptly cooled; where floors of impervious material are not provided in milk rooms and stables; where screens are not provided; and where the owner refuses to permit an inspection of his premises, or who refuses to cooperate with the board of health.

RULE 3. *Construction.*—The floors in dairies, stables, milk rooms, and milk depots shall be smooth, free from crevice and defects, and water-tight and constructed of some impervious material. The walls and ceilings shall be smooth, tight, and free from unnecessary projections, niches, etc., and kept well painted or whitewashed. The milk room shall be provided with glass windows, proper cooling tanks for the milk, smooth and tight walls and ceilings, and must be screened between April 1 and November 15 each year, as must be all milk depots.

RULE 4. *Ventilation.*—All milk depots and milk rooms shall be provided with adequate ventilation by means of windows, air shafts, air ducts, and other mechanical apparatus, if required, so as to insure free circulation of fresh air at all times.

RULE 5. *Refrigerator and ice boxes.*—The inner wall of the compartment of the refrigerator and ice boxes where milk is kept shall be smooth and metal, or porcelain lined. The milk department shall be kept clean and free from any odor. Nothing but milk and milk products shall be stored in the ice box. This applies to all groceries and meat markets handling milk, as well as to depots and dairies.

RULE 6. *Drying racks.*—Drying racks shall be provided on which bottles and cans can be placed in an inverted position for proper drainage.

RULE 7. *Pasteurizers and separators.*—Pasteurizers and separators shall be so constructed that all parts, including pipes, can be readily cleansed and sterilized. These appliances must be kept scrupulously clean, inside and out, at all times.

RULE 8. *Utensils.*—All shipping cans, bottles, dippers, skimmers, measures, strainers, stirrers, and other utensils must be so constructed that all parts are absolutely free from spaces where milk can accumulate or soak in, so that it can not be removed by simple washing. The surface coming in contact with milk, cream, or buttermilk must be smooth and free from excessive rust. All utensils must be kept scrupulously clean, inside and out, at all times. All utensils before use must be thoroughly sterilized by boiling water or live steam. Utensils must be kept in good repair and free from rough surfaces of any kind. When not in use, they shall be kept dry, inverted, and on racks or hooks where flies can not reach them. Bottle caps must be kept in clean, covered, dry, and dust-proof receptacles.

RULE 9. *Maintenance and care.*—The floors shall be kept clean and scrubbed. The walls, ceiling, shelves, windows, and other surfaces must be clean and free from dust by washing or wiping with damp cloth. Unnecessary articles, such as boxes, old utensils, harness, lanterns, and other articles not required in the milk business shall not be kept in a milk depot or milk room, or in the cow stables.

RULE 10. *Attendants.*—Every person in charge of such milk depot or dairy shall keep himself and his employees in a clean condition and cleanly clothed while engaged in the bottling, pouring, or other handling of milk, including milking of the cows.

RULE 11. *Communicable diseases.*—No person with tuberculosis, any venereal disease, or any communicable disease shall work in any milk depot, dairy, or in any other place where milk or its products are handled. When typhoid fever, scarlet fever, diphtheria, smallpox, tuberculosis, measles, or chicken pox occur in the house or families of anyone engaged in the handling of milk it shall be the duty of the owner or manager to notify the board of health at once of this fact, so that the necessary regulations can be enforced, in cooperation with the board of health, to prevent the spread of the disease. No one afflicted with or convalescent from typhoid fever, scarlet fever, diphtheria, smallpox, measles, or any other communicable disease shall engage in the handling of milk, cream, or buttermilk, nor enter a depot or dairy during such period. When any of the above-enumerated or any other communicable diseases exist in the house or family of anyone engaged in the handling of milk, he shall at once discontinue his work in the milk depot, dairy, or on their vehicles. The depot, dairy, or wagon shall be declared infected if anyone with or convalescent from any of the above-enumerated diseases or any other communicable disease has worked therein or thereon, together with all milk, cream, or buttermilk with which any such party may have come in contact. No person convalescent from any communicable disease or living in any house or on any premises where any communicable disease exists shall reengage in the handling of milk unless the board of health has enforced suitable

quarantine regulations and the necessary disinfection has been done under the supervision and direction of the board of health. No milk dealer or his or her employees shall take from a quarantined house any money, tickets, cans, containers, etc.

RULE 12. *Operation.*—All milk shall be stored at a temperature not above 50° F. Sour milk must not be allowed to stand in the dairyman's cans. Nothing except milk, cream, or buttermilk shall be permitted in the milk vats, ice boxes, and coolers. Returned empty bottles and other utensils must be thoroughly cleansed and sterilized before being conveyed into the milk room.

SEC. 12. The board of health may through its duly authorized officers or inspectors visit, view, and inspect all vessels, cans, receptacles, refrigerators, buildings, platforms, establishments, or places of any kind containing milk or its products and examine the conditions thereof with reference to cleanliness and sanitation and cause the removal and abatement of any unfit, unclean, or injurious condition attending the keeping, storing or possession, care, custody or control of milk or its products at any and in all places; and said board of health through its authorized officers or inspectors shall have the right and power to enter and have full access to any building or premises where any milk or its products are stored or kept for sale, and to all wagons, railroads, cars, or vehicles used for the purpose of delivering milk or its products, and shall have the right to remove samples of such milk or its products therefrom for the purpose of inspecting, testing, or analyzing same.

SEC. 13. That any person or persons violating any of the sections of this ordinance or section or part thereof of the rules and regulations of the board of health, shall upon conviction be judged guilty of a misdemeanor, and shall be fined not less than $5 nor more than $25 for each offense.

SEC. 14. That all ordinances or parts of ordinances in conflict with this ordinance be, and the same are hereby, repealed.

SEC. 15. That this ordinance take effect from and after its passage, the welfare of the city requiring it.

[Ordinance passed Dec. 14, 1911.]

LOS ANGELES, CAL.

MILK—NO MILK TO BE SOLD OR OFFERED FOR SALE OR EXCHANGE EXCEPTING THAT COMING FROM COWS WHICH HAVE GIVEN A SATISFACTORY NEGATIVE TUBERCULIN TEST.

SECTION 1. It shall be unlawful for any person, firm, or corporation to bring or receive, or to cause or permit to be brought or received into the city of Los Angeles for sale, or to sell, exchange, or deliver, or to offer for sale, exchange, or delivery, or to cause or permit to be sold, exchanged, or delivered, or to be offered for sale, exchange, or delivery, or to have in possession for sale, exchange, or delivery any milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or condensed or evaporated skimmed milk, unless such milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or condensed or evaporated skimmed milk be obtained from cows that have given a satisfactory negative tuberculin test, as hereinafter provided: *Provided, however,* That the provisions of this section shall not apply to condensed or evaporated milk or condensed or evaporated skimmed milk which is sterilized and is contained in hermetically sealed packages labeled with the name of the article and with the name of the person, firm, or corporation by whom the same is prepared.

SEC. 2. Every cow or bull and all young stock shall be considered tubercular if following an injection of tuberculin any such cow, bull, or young stock shall exhibit a temperature, within 24 hours after such injection, of or exceeding 103.8° by the Fahrenheit thermometer, or which shall exhibit a temperature, within 24 hours after such injection, of or exceeding 2° by the Fahrneheit thermometer higher than the temperature of such cow, bull, or young stock recorded prior to the injection of such tuberculin. Said tuberculin test shall be made in accordance with the rules and regulations prescribed by the United States Bureau of Animal Industry.

SEC. 3. Until January 1, 1915, milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or condensed or evaporated skimmed milk obtained from cows which have not given a satisfactory negative tuberculin test, may be sold within the city of Los Angeles under the following conditions and not otherwise, to wit:

No milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or condensed or evaporated skimmed milk from cows which have not given a satisfactory negative tuberculin test, shall be sold or offered for sale, exchanged, given away, or delivered within the city of Los Angeles unless such milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or con-

densed or evaporated skimmed milk shall first have been pasteurized in a pasteurizer that is equipped with a self-regulating flowing device and self-recording thermometer, and unless all such milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or condensed or evaporated skimmed milk shall have exhibited a temperature of not less than 145° by the Fahrenheit thermometer, and shall have been maintained at such temperature for not less than 20 minutes.

SEC. 4. It shall be unlawful for any person, firm, or corporation to bring or receive, or to cause or permit to be brought or received, into the city of Los Angeles for sale, or to give away, sell, or offer for sale or to cause or permit to be sold or offered for sale, or to have in possession for sale, exchange, or delivery therein, any milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or condensed or evaporated skimmed milk obtained from any cows which have given a satisfactory negative tuberculin test which are permitted to associate or come in contact with any cattle which have exhibited a reaction to the tuberculin test, or to fail, neglect, or refuse to immediately separate and keep separated all cattle which have given a satisfactory negative tuberculin test from cattle which have exhibited a reaction to the tuberculin test.

It shall be unlawful for any such person, firm, or corporation to fail, neglect, or refuse to disinfect any premises where cattle which have exhibited a reaction to the tuberculin test have been kept or from which such cattle have been removed, in such manner and within such time as the health commissioner shall direct.

It shall be unlawful for any such person, firm, or corporation to handle the milk of any cow which has exhibited a reaction to the tuberculin test in any utensils used for the handling of milk of cows which have given a satisfactory negative tuberculin test.

SEC. 5. Every person, firm, or corporation supplying milk, cream, buttermilk, skimmed milk, pasteurized milk, condensed or evaporated milk, or condensed or evaporated skimmed milk to the city of Los Angeles, or any inhabitant thereof, produced from or by any dairy cattle owned or controlled by such person, firm, or corporation, shall, within 10 days after this ordinance becomes effective, make written application to the health commissioner for the tuberculin test to be applied to such dairy cattle. Such application shall be made annually and shall set forth the number and kind of dairy cattle in possession of or under the control of the applicant. On premises where tubercular cattle have been found and have been removed the remaining cattle shall be subjected to a retest within the period of six months from the time the last test was applied. Dairy cattle to which the tuberculin test has not been applied shall be kept separate from nonreacting dairy cattle until such cattle shall have given a satisfactory negative tuberculin test.

SEC. 6. The tuberculin test required to be made under the provisions of this ordinance shall be made under the direction of the health commissioner and shall be made free of charge.

SEC. 7. All dairy cattle found free from tuberculosis as determined by the tuberculin test shall be marked by placing a metal tag in the right ear; such tag shall bear the following inscription, L. A. T. T. No.——. All dairy cattle affected with tuberculosis as determined by a reaction to the tuberculin test shall be marked by punching out of the right ear the letter T, such letter to be not less than 1½ inches in height and 1¼ inches in width, or by branding with a branding iron such letter T in the middle of the forehead.

SEC. 8. The health commissioner shall designate the time and place where herds of 10 dairy cattle or less shall be presented to have the tuberculin test applied.

SEC. 9. It shall be unlawful for any person other than the health commissioner or his regularly appointed assistants, deputies, or inspectors, or inspectors of the United States Bureau of Animal Industry, or the State veterinarian or his assistants, deputies, or inspectors to place, attach, or apply any tag or brand of the kind or character described in section 7 of this ordinance.

SEC 10. Nothing in this ordinance contained shall be deemed to prevent the health commissioner from applying the ophthalmo test in addition to the subcutaneous test.

SEC. 11. That any person, firm, or corporation violating any of the provisions of this ordinance shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punishable by a fine of not more than $500 or by imprisonment in the city jail for a period of not more than six months, or by both such fine and imprisonment.

SEC. 12. The city clerk shall certify to the passage of this ordinance and cause the same to be published once in the Los Angeles Daily Journal.

[Ordinance adopted Nov. 28, 1911.]

2. No milk shall be sold, delivered, stored, or transported at a temperature exceeding 50° F.

3. Every license required under section 27 of the ordinance to which this ordinance is a supplement shall, when said license applies to the sale of milk from a store or booth, be plainly displayed at all times in or upon said store or booth.

4. No milk shall hereafter be sold or offered for sale or delivered within the city of Orange which shall be produced in dairies having a rating below 60 per cent, as based on the score card adopted by the board of health of the State of New Jersey, or which contains an excessive number of bacteria.

5. No person shall issue, circulate, or use milk tickets or coupons that have been previously used, and no person having custody of a milk can, bottle, or other vessel used as a container for milk intended for sale or distribution, shall place or permit to be placed therein any milk ticket or any other article or substances other than milk or its products or water or other agent used for cleansing such bottle, can, or vessel.

6. No cream shall be sold or offered for sale or delivered within the city of Orange unless it shall be produced and handled in accordance with the requirements set forth in the ordinances and regulations of this board in relation to the production and handling of milk.

7. No ice cream shall be manufactured, sold, or offered for sale in the city of Orange unless the milk and cream entering into the composition of the same shall comply with all requirements set forth in the ordinances and regulations of this board and of the board of health of the State of New Jersey.

[Ordinance, board of health, adopted Oct. 2, 1911, as a supplement to the sanitary and plumbing code adopted Dec. 1, 1900.]

CEREBROSPINAL MENINGITIS.

CASES AND DEATHS REPORTED BY CITY HEALTH AUTHORITIES FOR THE WEEK ENDED APRIL 6, 1912.

City.	Cases.	Deaths.	City.	Cases.	Deaths.
Baltimore, Md		3	New Orleans, La	3	4
Boston, Mass	1	1	Newport, Ky	1	
Bridgeport, Conn		1	New York, N. Y	8	11
Chicago, Ill	2	1	Norristown, Pa		1
Cincinnati, Ohio	2		Oakland, Cal		1
Cleveland, Ohio		1	Oklahoma City, Okla	2	
Denver, Colo	1	1	Omaha, Nebr	5	3
Fall River, Mass	1	1	Philadelphia, Pa		1
Galveston, Tex	3	1	Racine, Wis		1
Haverhill, Mass	4		Roanoke, Va	3	2
Jacksonville, Fla	1	1	St. Louis, Mo	6	1
Kansas City, Kans	17		San Antonio, Tex	5	
Kansas City, Mo	24	26	Springfield, Ill		1
Lexington, Ky	1		Wilmington, Del		1
Malden, Mass		1	Worcester, Mass		1
Nashville, Tenn	12	1			

OKLAHOMA.

From December 1, 1911, to March 27, 1912, 415 cases of cerebrospinal meningitis with 159 deaths were reported in the State of Oklahoma. Of these 133 cases with 38 deaths were reported from February 29 to March 27. The cases were reported from 51 counties.

ERYSIPELAS.

CASES AND DEATHS REPORTED BY CITY HEALTH AUTHORITIES FOR THE WEEK ENDED APR. 6, 1912.

City.	Cases.	Deaths.	City.	Cases.	Deaths.
Baltimore, Md		2	Lynn, Mass		1
Camden, N. J	1		Montclair, N. J	2	
Cincinnati, Ohio	1		New York, N. Y	30	13
Cleveland, Ohio	6		Norristown, N. J	1	
Cumberland, Md	1		Philadelphia, Pa	15	
Haverhill, Mass	1		Providence, R. I		1
Jersey City, N. J		1	Reading, Pa	1	
Kalamazoo, Mich	1		Saginaw, Mich	1	1
Los Angeles, Cal	4	1	St. Louis, Mo	14	3

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, 2,998 acres of land in Alameda County were covered with poison during the week ended April 6, 1912.

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—	Total collected.	Found dead.	Examined.	Found infected.
California:					
Cities—					
Berkeley	Apr. 6, 1912	[1] 139	8	96	.....
Oakland	do	[2] 738	22	544	.....
San Francisco	do	[3] 1,803	20	1,395	.....
Washington:					
City—					
Seattle	do	1,094	.....	1,054	.....

[1] Identified: Mus norvegicus, 104; Mus musculus, 35.
[2] Identified: Mus norvegicus, 566; Mus musculus, 172.
[3] Identified: Mus norvegicus, 778; Mus rattus, 307; Mus alexandrinus, 313; Mus musculus, 405.

SQUIRRELS COLLECTED AND EXAMINED FOR PLAGUE INFECTION.

During the week ended April 6, 1912, 326 ground squirrels from Alameda County, Cal., were examined for plague infection. No plague-infected squirrel was found.

PNEUMONIA.

CASES AND DEATHS REPORTED BY CITY HEALTH AUTHORITIES FOR THE WEEK ENDED APRIL 6, 1912.

City.	Cases.	Deaths.	City.	Cases.	Deaths.
Altoona, Pa		2	Montgomery, Ala		1
Ann Arbor, Mich	3		Nashville, Tenn		7
Auburn, N. Y	4	2	Newark, N. J		5
Baltimore, Md		24	New Bedford, Mass		6
Berkeley, Cal		1	New Castle, Pa	1	
Binghampton, N. Y	10	3	New Orleans, La		5
Boston, Mass		38	Newton, Mass		3
Bridgeport, Conn		7	New York, N. Y		137
Cambridge, Mass		3	Niagara Falls, N. Y		3
Chelsea, Mass		1	Norristown, Pa		2
Chicopee, Mass		2	Northampton, Mass		1
Chicago, Ill	41	147	Oakland, Cal		3
Cincinnati, Ohio		12	Oklahoma, Okla		2
Cleveland, Ohio	27	7	Omaha, Nebr		6
Cumberland, Md		1	Passaic, N. J		4
Danville, Ill		2	Pawtucket, R. I		4
Dayton, Ohio		4	Philadelphia, Pa	39	53
Duluth, Minn		1	Pittsfield, Mass		3
Dunkirk, N. Y	1	1	Pottstown, Pa		3
East Orange, N. J		3	Providence, R. I		8
Elmira, N. Y		2	Racine, Wis		2
El Paso, Tex		6	Reading, Pa	1	1
Evansville, Ind		3	Roanoke, Va		2
Everett, Mass		2	Rockford, Ill		1
Fall River, Mass		9	Saginaw, Mich	2	
Grand Rapids, Mich	2	3	Salem, Mass		1
Harrisburg, Pa	4		San Antonio, Tex		7
Hartford, Conn		7	San Diego, Cal	1	1
Haverhill, Mass	8		Saratoga Springs, N. Y	3	
Homestead, Pa	2	2	Schenectady, N. Y	11	4
Kalamazoo, Mich	2	2	South Bend, Ind		5
Kansas City, Kans	14	14	South Bethlehem, Pa	1	
Knoxville, Tenn		1	Spokane, Wash		1
La Fayette, Ind		2	Springfield, Ill		4
Lancaster, Pa	1		Springfield, Mass		9
Lawrence, Mass		4	Taunton, Mass		2
Los Angeles, Cal	1	9	Toledo, Ohio		5
Lowell, Mass		2	Washington, D. C		19
Lynchburg, Va		1	Wheeling, W. Va		4
Lynn, Mass		3	Wilkes-Barre, Pa	4	4
Manchester, N. H	7	7	Wilkinsburg, Pa	1	
Marinette, Wis		3	Wilmington, Del		5
Medford, Mass		2	Wilmington, N. C	5	3
Moline, Ill		1	Zanesville, Ohio		2
Montclair, N. J		1			

POLIOMYELITIS.

CASES AND DEATHS REPORTED BY CITY HEALTH AUTHORITIES FOR THE WEEK ENDED APRIL 6, 1912.

City.	Cases.	Deaths.	City.	Cases.	Deaths.
Boston, Mass		1	Los Angeles, Cal		1
Lancaster, Pa	1		Lowell, Mass	1	
Logansport, Ind		1	New York, N. Y	2	1

TETANUS.

During the week ended April 6, 1912, tetanus was reported as follows: Chicago, Ill., 1 death; New York, N. Y., 2 deaths; Philadelphia, Pa., 1 case.

SMALLPOX IN THE UNITED STATES.

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

REPORTS RECEIVED DURING WEEK ENDED APR. 26, 1912.

Places.	Date.	Cases.	Deaths.	Remarks.
District of Columbia	Apr. 7–13	1		
Florida:				
Counties—				
Alachua	Apr. 1–6	2		
Duval	do	5		
Escambia	do	1		
Hernando	do	2		
Hillsboro	do	1		
Polk	do	7		
Putnam	do	4		
Total for State		22		
Kansas:				
Counties—				
Allen	Feb. 1–29	2		
Cloud	do	1		
Coffey	do	2		
Cowley	do	1		
Crawford	do	4		
Ford	do	1		
Lyon	do	4		
Reno	do	1		
Woodson	do	1		
Wyandotte	do	3		
Total for State		20		
*Louisiana:				
New Orleans	Apr. 4–11	12		
Montana:				
Counties—				
Cascade	Mar. 1–31	1		
Chouteau	do	2		
Fergus	do	3		
Hill	do	1		
Lewis and Clark	do	1		
Lincoln	do	4		
Missoula	do	1		
Silverbow	do	1		
Teton	do	3		
Total for State		17		
New Jersey	Mar. 1–31			No case
Oklahoma:				
Counties—				
Bryan	Feb. 1–29	1		
Delaware	do	20		
Le Flore	do	1		
Logan	do	5		
Muskogee	do	3		
Osage	do	30		
Pittsburg	do	1		
Sequoyah	do	1		
Tulsa	do	2		
Total for State		64		

SMALLPOX IN THE UNITED STATES—Continued.

Reports Received during Week ended Apr. 26, 1912.

Places.	Date.	Cases.	Deaths.	Remarks.
South Dakota:				
Counties—				
Brown	Mar. 1-31	30		
Charles Mix	do	2		
Clay	do	2		
Corson	do	1		
Custer	do	25		
Edmunds	do	2		
Lincoln	do	3		
McCook	do	2		
Marshall	do	1		
Moody	do	1		
Pennington	do	1	1	
Roberts	do	1		
Spink	do	17		
Walworth	do	1		
Yankton	do	1		
Total for State		90	1	
Grand total for the United States		226	1	

MORBIDITY AND MORTALITY.

MORBIDITY AND MORTALITY TABLE, CITIES OF THE UNITED STATES, FOR WEEK ENDED APR. 6, 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	201	11	1	19	....	13	....	....	....	44	29	11	2
Boston, Mass	670,585	236	22	2	150	2	29	1	....	....	68	17	8	....
Chicago, Ill	2,185,283	.....	117	21	142	2	225	17	....	....	147	106	12	1
Cleveland, Ohio	560,663	151	16	5	62	1	35	1	....	....	21	11	4	1
New York, N. Y	4,766,883	1,691	298	30	1,879	33	501	22	1	....	409	208	31	3
Philadelphia, Pa	1,549,008	482	40	8	30	....	75	3	....	....	83	66	15	3
St. Louis, Mo	687,029	250	25	2	53	....	20	2	....	....	42	22	4	1
Cities having from 300,000 to 500,000 inhabitants.														
Buffalo, N. Y	423,715	142	9	1	62	....	23	1	....	....	12	14	2	1
Cincinnati, Ohio	364,463	135	8	....	16	....	23	....	....	....	25	21	....	1
Detroit, Mich	465,766	188	19	3	.....	....	46	1	2	....	.....	.....	.....	.....
Los Angeles, Cal	319,198	116	13	1	.....	....	6	1	1	....	9	15	.....	.....
Milwaukee, Wis	373,857	125	8	3	97	2	35	4	....	....	20	10	7	....
Newark, N. J	347,469	93	20	2	27	2	12	.....	.....	.....	31	13	....	1
New Orleans, La	339,075	115	6	1	1	....	16	....	19	....	43	18	3	....
San Franciso, Cal	416,912	135	2	....	60	4	9	....	1	....	17	6	2	....
Washington, D. C	331,069	147	4	....	46	....	2	.....	.....	.....	38	19	7	2
Cities having from 200,000 to 300,000 inhabiatnts.														
Denver, Colo	213,381	58	7	1	.....	....	6	....	3	....	.....	11	.....	.....
Jersey City, N. J	267,779	84	.....	2	.....	.....	.....	.....	.....	.....	.....	16	.....	.....
Kansas City, Mo	248,381	49	11	2	4	....	6	.....	.....	.....	2	7	2	....
Providence, R. I	224,326	73	12	2	18	3	12	.....	.....	.....	5	7	1	1

MORBIDITY AND MORTALITY—Continued.

Morbidity and mortality table, cities of the United States, for week ended Apr. 6, 1912—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.														
Bridgeport Conn	102,054	27	....	1	2	....	4	1	....	....	3	....	....	....
Cambridge, Mass.	104,839	22	4	....	80	....	7	....	....	....	7	1	....	....
Dayton, Ohio	116,577	28	....	....	17	....	....	....	12	....	....	3	....	....
Fall River, Mass.	119,295	41	2	....	....	....	....	....	....	....	5	3	....	....
Grand Rapids, Mich.	112,571	34	3	1	5	....	5	....	....	....	6	5	7	....
Lowell, Mass.	106,294	39	1	....	15	....	2	....	....	....	4	7	....	1
Nashville, Tenn.	110,364	36	....	....	1	....	....	....	....	....	3	3	3	2
Oakland, Cal.	150,174	45	1	....	8	....	1	....	1	....	4	7	2	....
Omaha, Nebr.	124,096	25	1	....	3	....	1	....	1	....	1	1	....	....
Richmond, Va.	127,628	56	4	....	88	....	1	....	....	....	14	4	....	....
Spokane, Wash.	104,402	....	....	....	79	....	7	....	7	....	....	....	1	....
Toledo, Ohio	168,497	76	3	1	40	2	4	....	....	....	....	5	....	1
Worcester, Mass.	145,986	45	3	....	9	....	14	....	....	....	9	8	....	....
Cities having from 50,000 to 100,000 inhabitants.														
Altoona, Pa.	52,127	12	1	....	....	*1	1	1	....	....	1	....	....	....
Bayonne, N. J.	55,545	17	5	....	8	....	9	1	....	....	1	....	....	....
Brockton, Mass.	56,878	15	1	....	26	....	7	....	....	....	2	....	....	....
Camden, N. J.	94,538	....	5	....	....	....	3	....	....	....	9	....	....	....
Duluth, Minn.	78,466	21	....	....	....	....	6	....	....	....	6	10	....	1
Evansville, Ind.	69,647	20	2	....	....	....	....	....	....	....	....	2	1	....
Fort Wayne, Ind.	63,933	8	3	....	10	....	1	....	....	....	2	1	....	....
Harrisburg, Pa.	64,186	23	1	....	195	....	1	....	1	....	3	3	1	....
Hartford, Conn.	98,915	33	5	1	20	....	7	1	....	1	....	6	....	....
Hoboken, N. J.	70,324	10	2	....	2	....	1	....	....	....	4	....	....	....
Jacksonville, Fla.	57,699	....	3	....	10	....	....	....	5	....	2	3	....	....
Johnstown, Pa.	55,482	16	2	....	1	....	....	....	....	....	....	1	....	....
Kansas City, Kans.	82,331	....	4	....	3	....	5	....	....	....	....	....	1	....
Lawrence, Mass.	85,892	23	....	....	1	....	2	....	....	....	2	2	3	....
Lynn, Mass.	89,336	31	4	....	1	....	8	1	....	....	5	3	....	....
Manchester, N. H.	70,063	24	1	....	5	....	1	....	....	....	....	....	....	....
New Bedford, Mass.	96,652	....	2	....	14	....	3	....	....	....	4	4	....	....
Oklahoma City, Okla.	64,205	15	....	....	....	....	....	....	....	....	....	1	1	....
Passaic, N. J.	54,773	19	5	....	34	1	1	1	....	....	....	1	1	....
Pawtucket, R. I.	51,622	6	....	....	....	....	....	1	....	....	....	1	....	....
Portland, Me.	58,571	23	2	....	1	....	3	....	....	....	....	....	....	....
Reading, Pa.	96,071	31	2	....	2	....	2	....	....	....	1	3	....	....
Saginaw, Mich.	50,510	6	4	....	....	....	2	....	....	....	4	5	3	....
San Antonio, Tex.	96,614	37	5	....	4	....	4	1	4	....	....	7	....	....
Schenectady, N. Y.	72,826	14	2	....	62	....	3	....	....	....	8	1	....	....
South Bend, Ind.	53,684	20	....	....	....	....	....	....	....	....	....	....	2	1
Springfield, Ill.	51,678	26	1	....	....	....	....	....	1	....	....	2	....	....
Springfield, Mass.	88,926	26	....	....	11	....	....	1	....	....	1	....	....	....
Trenton, N. J.	96,815	33	2	....	1	....	....	....	....	....	9	4	....	....
Wilkes-Barre, Pa.	67,105	27	1	....	6	....	3	....	....	....	1	2	....	....
Wilmington, Del.	87,411	28	....	....	....	....	....	....	....	....	....	3	....	....
Yonkers, N. Y.	79,803	14	7	....	1	....	11	....	....	....	7	3	1	....
Cities having from 25,000 to 50,000 inhabitants.														
Atlantic City, N. J.	46,150	9	4	....	....	....	3	....	....	....	....	....	2	....
Auburn, N. Y.	34,668	12	....	....	....	....	....	....	....	....	1	1	....	....
Aurora, Ill.	29,807	7	1	....	....	....	....	....	....	....	....	1	....	....
Berkeley, Cal.	40,434	....	....	....	23	....	....	....	....	....	....	1	....	....
Binghamton, N. Y.	48,443	17	1	....	2	....	5	....	....	....	....	2	2	....
Brookline, Mass.	27,792	5	....	....	1	....	1	....	....	....	3	....	....	....
Chelsea, Mass.	32,452	9	....	....	19	....	1	....	....	....	6	1	2	....
Chicopee, Mass.	25,401	11	....	....	1	....	2	....	....	....	....	1	....	....
Danville, Ill.	27,871	7	1	....	1	....	1	....	....	....	....	1	....	....
East Orange, N. J.	34,371	12	....	....	7	....	6	....	....	....	3	1	....	....
Elmira, N. Y.	37,176	14	1	....	3	....	....	....	....	....	12	2	....	....
El Paso, Tex.	39,279	30	1	1	....	....	2	....	....	1	....	4	1	....
Everett, Mass.	33,484	8	2	....	12	....	1	....	....	....	3	....	....	....
Fitchburg, Mass.	37,826	15	1	1	....	....	....	....	....	....	....	1	1	....
Haverhill, Mass.	44,115	17	....	....	11	....	4	....	....	....	3	....	1	....
Kalamazoo, Mich.	39,437	9	....	....	2	....	3	....	....	....	....	....	....	....
Knoxville, Tenn.	36,346	15	....	....	11	....	....	....	1	....	....	3	....	....
La Crosse, Wis.	30,417	....	1	....	....	....	....	....	....	....	....	....	....	....

MORBIDITY AND MORTALITY—Continued.

Morbidity and mortality table, cities of the United States, for week ended Apr. 6, 1912—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.**														
Lancaster, Pa.	47,227	.....	1	....	117	....	2	....	....	....	4	....	....	....
Lexington, Ky.	35,099	19	1	....	.....	....	1	....	....	....	.....	1	....	....
Lima, Ohio	30,508	7	3	....	1	....	1	....	....	....	.....	....	....	....
Lynchburg, Va.	29,494	5	1	....	44	....	1	....	....	....	.....	....	1	....
Malden, Mass.	44,404	6	1	....	12	....	2	....	....	....	.....	....	....	....
Montgomery, Ala.	38,136	13	1	....	4	....	.....	....	2	....	1	1	....	....
Mount Vernon, N. Y.	30,919	.....	10	....	31	....	8	....	....	....	1	....	....	....
Newcastle, Pa.	36,280	.....	3	....	.....	....	.....	....	....	....	7	....	3	....
Newport, Ky.	30,309	12	....	....	.....	....	7	....	....	....	3	3	....	....
Newton, Mass.	39,806	8	....	....	37	....	2	....	....	....	.....	....	....	....
Niagara Falls, N. Y.	30,445	16	....	....	.....	....	2	....	....	....	1	1	....	1
Norristown, Pa.	27,875	10	5	....	13	....	.....	....	....	....	.....	2	....	....
Orange, N. J.	29,630	5	1	....	2	....	.....	....	....	....	1	1	1	....
Pittsfield, Mass.	32,121	7	2	....	2	....	.....	....	....	....	1	....	1	....
Portsmouth, Va.	33,190	10	.....	....	.....	....	.....	....	8	....	.....	....	....	....
Racine, Wis.	38,002	11	2	1,	.....	....	4	....	....	....	.....	1	....	....
Roanoke, Va.	34,874	14	2	....	31	....	.....	....	....	....	22	6	....	....
Rockford, Ill.	45,401	12	.....	....	.....	....	5	....	....	....	.....	1	19	2
Salem, Mass.	43,697	12	.....	....	.....	....	.....	....	....	....	.....	1	....	....
San Diego, Cal.	39,578	5	.....	....	3	....	1	....	....	....	4	4	....	....
Superior, Wis.	40,384	3	.....	....	.....	....	.....	....	....	....	.....	1	3	....
Taunton, Mass.	34,259	18	.....	....	1	....	.....	....	....	....	3	2	....	....
Waltham, Mass.	27,834	4	.....	....	33	....	1	....	....	....	.....	....	....	....
West Hoboken, N. J.	35,403	8	2	....	.....	....	4	....	....	....	.....	1	....	....
Wheeling, W. Va.	41,641	21	.....	....	3	....	.....	....	....	....	1	3	3	....
Williamsport, Pa.	31,860	7	.....	....	8	....	.....	....	....	....	.....	....	....	....
Wilmington, N. C.	25,748	9	1	....	6	....	3	....	2	....	.....	....	....	....
York, Pa.	44,750	.....	.....	....	.....	....	1	....	....	....	4	....	1	....
Zanesville, Ohio	28,026	13	1	1	.....	....	2	....	....	....	17	1	....	....
Cities having less than 25,000 inhabitants.														
Alameda, Cal.	23,833	6	.....	....	3	....	1	....	....	....	.....	....	....	....
Beaver Falls, Pa.	12,191	1	1	1	.....	....	.....	....	....	....	.....	....	1	....
Bennington, Vt.	.....	4	.....	....	1	....	.....	....	....	....	3	2	....	....
Cambridge, Mass.	11,327	2	.....	....	1	....	.....	....	....	....	.....	....	....	....
Carbondale, Pa.	17,040	8	.....	....	13	....	.....	....	....	....	.....	....	....	....
Clinton, Mass.	13,075	6	.....	....	.....	....	.....	....	....	....	.....	1	....	....
Coffeyville, Kans.	12,687	.....	1	....	.....	....	.....	....	....	....	1	....	....	....
Columbus, Ga.	20,554	5	.....	....	.....	....	.....	....	3	....	.....	....	....	....
Concord, N. H.	21,497	10	1	....	9	....	.....	....	....	....	.....	....	....	....
Cumberland, Md.	21,839	9	.....	....	10	....	.....	....	....	....	1	1	2	....
Dunkirk, N. Y.	.....	8	.....	....	.....	....	.....	....	....	....	.....	2	....	....
Galesburg, Ill.	20,089	9	.....	....	.....	....	.....	....	....	....	.....	1	....	....
Harrison, N. J.	14,498	2	.....	....	.....	....	1	....	....	....	1	....	....	....
Homestead, Pa.	18,713	9	.....	....	1	....	.....	....	....	....	.....	1	....	....
Kearny, N. J.	18,659	6	2	....	6	....	1	....	....	....	.....	....	....	....
La Fayette, Ind.	20,081	7	.....	....	.....	....	.....	....	....	....	.....	2	....	....
Logansport, Ind.	19,050	4	.....	....	.....	....	.....	....	....	....	.....	1	10	1
Marinette, Wis.	14,610	5	.....	....	.....	....	1	....	....	....	.....	....	....	....
Marlboro, Mass.	14,577	2	1	....	.....	....	1	....	....	....	.....	....	....	....
Massillon, Ohio	.....	2	.....	....	2	....	.....	....	....	....	.....	....	....	....
Medford, Mass.	23,156	6	3	....	12	....	.....	....	....	....	2	1	....	....
Melrose, Mass.	15,715	5	.....	....	28	....	2	....	....	....	.....	1	....	....
Moline, Ill.	24,199	7	.....	....	.....	....	.....	....	....	....	2	1	....	....
Montclair, N. J.	21,150	8	.....	....	9	....	.....	....	....	....	4	1	....	....
Morristown, N. J.	12,507	3	.....	....	.....	....	.....	....	....	....	.....	1	....	....
Nanticoke, Pa.	18,507	7	1	....	.....	....	.....	....	....	....	.....	....	....	....
Newburyport, Mass.	19,240	5	.....	....	.....	....	.....	....	....	....	1	....	....	....
North Adams, Mass.	22,012	4	.....	....	4	....	.....	....	....	....	3	2	....	....
Northampton, Mass.	19,431	9	.....	....	.....	....	.....	....	....	....	1	....	....	....
Palmer, Mass.	.....	1	.....	....	.....	....	.....	....	....	....	.....	....	....	....
Pottstown, Pa.	.....	9	.....	....	.....	....	1	....	....	....	.....	1	....	....
Saratoga Springs, N. Y.	.....	3	1	....	.....	....	1	....	....	....	1	....	....	....
South Bethlehem, Pa.	19,973	8	.....	....	10	....	.....	....	....	....	6	1	....	....
Steelton, Pa.	14,246	6	3	1	.....	....	.....	....	....	....	1	....	....	....
Tiffin, Ohio	11,894	.....	.....	....	.....	....	1	....	....	....	.....	1	2	....
Wilkinsburg, Pa.	18,924	6	.....	....	.....	....	1	....	....	....	1	....	....	....
Woburn, Mass.	15,308	3	1	....	7	....	.....	....	....	....	.....	....	....	....

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

CONNECTICUT.—Month of March, 1912. Population of reporting towns, 1,126,694. Total number of deaths from all causes 1,663, including diphtheria 14, measles 18, scarlet fever 13, tuberculosis (pulmonary) 124, typhoid fever 9. Cases reported: Diphtheria 156 in 41 towns, measles 1,144 in 64 towns, scarlet fever 228 in 52 towns, smallpox 68 in 3 towns, tuberculosis (pulmonary) 131 in 46 towns, typhoid fever 24 in 14 towns.

FLORIDA.—Week ended April 6, 1912. Reports received from the State board of health show diphtheria present in 3 localities with 5 cases, malaria in 4 localities with 17 cases, smallpox in 7 counties with 22 cases, tuberculosis in 9 localities with 21 cases, typhoid fever in 2 localities with 6 cases.

KANSAS.—Month of February, 1912. Population 1,690,949. Total number of deaths from all causes not reported. The deaths include diphtheria 7, measles 2, scarlet fever 9, typhoid fever 2. Cases reported: Diphtheria 106, measles 434, scarlet fever 248, smallpox 20, typhoid fever 40.

MASSACHUSETTS.—Week ended February 3, 1912. Population of reporting towns 2,593,485. Total number of deaths from all causes 865, including diphtheria 12, measles 4, scarlet fever 1, tuberculosis 72, typhoid fever 2. Cases reported: Diphtheria 144, measles 624, scarlet fever 154, smallpox 9, tuberculosis 163, typhoid fever 18.

Week ended February 10, 1912. Total number of deaths from all causes 851, including diphtheria 11, measles 7, scarlet fever 2, tuberculosis 70, typhoid fever 1. Cases reported: Diphtheria 131, measles 574, scarlet fever 149, smallpox 3, tuberculosis 24, typhoid fever 24.

Week ended February 17, 1912. Total number of deaths from all causes 894, including diphtheria 8, measles 12, scarlet fever 8, tuberculosis 96, typhoid fever 4. Cases reported: Diphtheria 116, measles 491, scarlet fever 140, smallpox 2, tuberculosis 183, typhoid fever 16.

Week ended February 24, 1912. Total number of deaths from all causes 895, including diphtheria 7, measles 3, scarlet fever 5, tuberculosis 60, typhoid fever 2. Cases reported: Diphtheria 128, measles 559, scarlet fever 123, tuberculosis 151, typhoid fever 20.

FOREIGN AND INSULAR.

CHINA.

Chaochowfu—Plague.

Consul Williams at Swatow reports March 16 the presence of plague at Chaochowfu, the principal city in the Swatow consular district.

Hongkong—Plague—Smallpox—Plague-infected Rats.

Surg. Brown reports: During the week ended March 9, 1912, 12 cases of plague with 12 deaths and 55 cases of smallpox with 43 deaths were reported in Hongkong.

During the same period 1,903 rats were examined for plague infection. Two plague-infected rats were 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 Trotter reports:

Week ended Mar. 30, 1912.

Total rats and mongoose taken	450
Rats trapped	441
Mongoose trapped	9
Rats examined bacteriologically	398
Classification of rats trapped:	
Mus alexandrianus	42
Mus musculus	85
Mus norvegicus	21
Mus rattus	293
Average number of traps set daily	1,720

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 Mar. 25 to 30, 1912, both inclusive.

Inspections of—	Total inspections.	Larvæ found in.	Ordered cleaned.	Oiled.	Drained.	Emptied.	Filled.	Ordered repaired.	Screened.	Stocked with mosquito fish.
Gutters, house	680	7	49	.....	.....	.....	.....	8	.....	.....
Gutters, street	311	32	.....	77	.....	.....	.....	.....	.....	.....
Standing water	394	32	.....	70	14	.....	.....	.....	.....	.....
Cesspools	975	43	.....	71	.....	.....	.....	26	.....	.....
Privy vaults	1,432	24	.....	35	.....	.....	.....	16	.....	.....
Holes and low places	662	169	.....	195	4	.....	79	.....	.....	5
Catch basins	425	39	.....	145	.....	.....	.....	.....	.....	.....
Leaky fixtures	49	1	.....	.....	.....	.....	.....	35	.....	.....
Water-holding plants	149	5	5	.....	.....	.....	.....	.....	.....	.....
Swamps	137	11	7	2	.....	.....	.....	.....	.....	2
Ponds	64	1	.....	1	.....	.....	.....	.....	.....	.....
Troughs and tanks	335	18	.....	1	.....	30	.....	.....	.....	3
Tubs or other receptacles	1,086	142	1	11	.....	451	.....	.....	.....	.....
Tin cans, bottles	1,536	118	.....	.....	.....	766	.....	.....	.....	.....
Water barrels	859	41	25	.....	.....	61	.....	.....	115	30
Vacant houses	223	.....	.....	.....	.....	.....	.....	.....	.....	.....

Number of loads of tin cans collected 32
Number of rice plantations inspected 15

Summary of Reports, November, 1911-March, 1912.

Inspections of—	Total inspections.	Wigglers found in.
Gutters, house	30,591	1,074
Gutters, street	4,146	399
Standing water	13,181	2,031
Cesspools	14,306	681
Privy vaults	18,472	456
Holes and low places	11,824	1,898
Catch basins	7,997	373
Leaky fixtures	3,432	44
Water-holding plants	30,928	1,641
Swamps	1,336	249
Ponds	708	104
Troughs and tanks	4,055	394
Tubs or other receptacles	10,939	1,208
Tin cans, bottles	259,824	2,967
Water barrels	7,305	1,268
Vacant houses	1,089	84
Yards	2,700	50
Grease traps	863	2
Washhouses	129	5
Holes in trees	10,771	166
Rice plantations	54	54

Loads of tin cans collected 224
Legal notices to abate nuisances served 616
Nuisances abated 525
Swamp land drained ..... acres.. 30
Ditches dug ..... miles (estimated).. 20

INDIA.

Calcutta—Cholera and Plague.

Acting Asst. Surg. Allan reports: During the week ended March 9 1912, 92 deaths from cholera and 90 from plague were reported at Calcutta; in all Bengal, 3,876 cases of plague; in all India, 19,145 cases of plague, with 16,608 deaths.

ITALY.

Examination of Emigrants.

Passed Asst. Surg. Robinson reports:

Vessels inspected at Naples, Messina, and Palermo, week ended March 30:

NAPLES.

Date.	Name of ship.	Destination.	Steerage passengers inspected and passed.	Pieces of baggage inspected and passed.	Pieces of baggage disinfected
Mar. 24	Saxonia	New York			
26	San Giorgio	do			
27	Oceania	Philadelphia	1,287	120	1,650
29	San Giorgio	New York	767	60	980
30	Venezia	do	845	110	1,550
30	Cedric	do	1,554	190	1,870
	Total		4,453	480	6,050

MESSINA.

Mar. 27	San Giorgio	New York	122	58	123
28	Borneo	do			
28	Cincinnati	do			
	Total		122	58	123

PALERMO.

Mar. 27	Columbia	New York			
28	Oceania	do	523	500	400
28	San Giorgio	do	384	400	300
29	Cincinnati	do			
30	Moncenisio	New Orleans			
	Total		907	900	700

JAPAN.

Plague in Formosa.

Consul Reat reports the occurrence of 13 cases of plague with 7 deaths in the island of Formosa during the week ended March 16.

From January to May, 1911, 246 cases of plague with 205 deaths were reported in Formosa.

JAVA.

Batavia—Typhus Fever.

Consul Rairden reports the occurrence of three cases of typhus fever with 2 deaths during the two weeks ended March 2, 1912.

SOUTH AFRICA.

Durban—Plague—Rat Infection.

The following information was received from the department of the interior at Pretoria: During the week ended March 15, 6 cases of plague with 4 deaths were reported at Durban, and during the week ended March 22, 3 cases with 4 deaths. The total number of cases reported to March 22 was 23 with 18 deaths. New foci of rat infection have been discovered.

VENEZUELA.

Caracas—Plague.

Information received from the American minister shows plague present at Caracas April 22.

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX.

REPORTS RECEIVED DURING THE WEEK ENDED APR. 26, 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				Year 1911: Deaths, 323,237.[1]
Calcutta	Feb. 25–Mar. 2		85	
Madras	Mar. 10–16	1	1	
Rangoon	Jan. 1–31	18	18	

YELLOW FEVER.

Brazil:				
Ceara	Feb. 1–29		4	

PLAGUE.

Brazil:				
Para	Mar. 24–30	1		
Chile:				
Iquique	Mar. 10–16	2	1	
China:				
Chaochowfu	do			Present.
Hongkong	Mar. 3–9	12	12	
India:				
Bombay	Mar. 10–16	76	65	
Calcutta	Feb. 22–Mar. 2		69	
Rangoon	Jan. 1–31	30	24	
Japan:				
Formosa	Mar. 7–16	13	7	
Persia:				
Bushire	Feb. 25–Mar. 2	12	9	
South Africa:				
Durban	Mar. 15–22	3	4	
Straits Settlements:				
Singapore	Feb. 18–24	1	1	
Turkey in Asia:				
Basra	Feb. 13	1	1	A stoker on a vessel from Bushire.
Jiddah	Feb. 5–Mar. 13	3	4	
Venezuela:				
Caracas	Apr. 22			Present.

[1] Bulletin Quarantenaire d'Egypte, Mar. 14, 1912.

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

Reports Received during Week ended Apr. 26, 1912.

SMALLPOX.

Places.	Date.	Cases.	Deaths.	Remarks.
Austria-Hungary:				
Galicia	Mar. 17–26	6		
Brazil:				
Para	Mar. 24–30	1	1	From Alagoas.
Canada:				
Montreal	Apr. 6–13	2		
Quebec	Apr. 7–13	8		
Chile:				
Iquique	Mar. 10–16	1	1	
China:				
Dalny	Mar. 1–23	3	2	
Hongkong	Mar. 3–9	55	43	
Egypt:				
Cairo	Mar. 4–11	1		
Germany	Mar. 4–Apr. 6	26		
Great Britain:				
London	Mar. 24–30	2		
India:				
Bombay	Mar. 10–16	80	46	
Calcutta	Feb. 22–Mar. 2		2	
Karachi	Mar. 10–16	78	69	
Rangoon	Jan. 1–31	42	10	
Italy:				
Leghorn	Mar. 24–30	1		
Madras	Mar. 10–16	12	2	
Naples	Mar. 24–30	3		
Japan:				
Formosa	Mar. 3–16	3		
Nogahama	Mar. 17–23	1		On s. s. Tenyo Maru from Hongkong.
Philippine Islands				Third quarter, 1911: Manila, 9 cases and no deaths.
Portugal:				
Lisbon	Mar. 14–20	3		
Russia:				
Moscow	Mar. 9–16	1	2	
Odessa	Mar. 19–23	7		
St. Petersburg	Mar. 17–23	11	7	
Warsaw	Feb. 11–17	19	4	
Spain:				
Valencia	Mar. 24–30	44	2	
Straits Settlements:				
Singapore	Feb. 18–Mar. 2	6	1	
Teneriffe:				
Santa Cruz	Mar. 24–30		4	
Turkey in Asia:				
Beirut	Mar. 17–23	90	5	

REPORTS RECEIVED FROM DEC. 30, 1911, TO APR. 19, 1912.

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

CHOLERA.

Places.	Date.	Cases.	Deaths.	Remarks.
Arabia:				
Hodeida	Jan. 21	2	1	
Ras-el-Ketib	Dec. 27–Jan. 1			Total cases, 22; deaths, 12; mainly in the military hospital.
Austria-Hungary:				
Coastland—				
Capodistria	Dec. 14–24	2	2	
Croatia and Slavonia				Total Oct. 22–Dec. 16: Cases, 36.
Sriem	Oct. 22–Dec. 16	36		
Hungary				Total Nov. 19–Dec. 23: Cases, 37. Free Dec. 28.
Backs-Bodog	Dec. 10–16	9	5	
Jasz-Nagykun-Szolnok	Dec. 3–23	11	7	
Torontal	Nov. 19–Dec. 16	17	2	
Bahrein Island	Nov. 27–Dec. 30		260	In the Persian Gulf.
Bulgaria:				
Burgas	Nov. 22–23	2	2	
Varna	Nov. 6	1		
China:				
Hongkong	Jan. 14–20	1	1	

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

Reports Received from Dec. 30, 1911, to Apr. 19, 1912.

CHOLERA—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Dutch East Indies				Total year 1911: Cases, 3,624; deaths, 2,919, including report, p. 2092, vol. 1.
Batavia	Nov. 12–Dec. 23	21	8	Free Dec. 31.
India:				
Bassein	Jan. 14–Feb. 24	109	90	
Calcutta	Nov. 5–Feb. 24		688	
Madras	Nov. 26–Mar. 7	540	438	Madras Presidency, Nov. 1–Dec. 31: Cases, 10,436; deaths, 6,545. Jan. 1–Feb. 29: Cases, 18,267; deaths, 11,563.
Moulmine	Feb. 18–24	2	2	
Negapatam	Jan. 14–Feb. 24		79	
Pondicherry	Feb. 22–28	4	4	
Rangoon	Oct. 1–Dec. 31	62	52	
Indo-China:				
Saigon	Nov. 20–Mar. 4	1,520	1,066	
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				Third quarter, 1911: Manila, 1 fatal case; Provinces, 27 cases and 22 deaths.
Province—				
Union	Oct. 29–Dec. 4	5	5	
Roumania				Total Sept. 9–Dec. 13: Cases, 192; deaths, 42, including report, p. 2094, vol. 1. Free Dec. 19.
Districts—				
Braila	Sept. 11–Dec. 13	84	11	Including cases previously reported.
Convoluri	Oct. 31–Nov. 28	21	1	
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–Jan. 27		755	
Straits Settlements:				
Singapore	Nov. 5–Feb. 3	4	4	
Tripoli:				
Tripoli	Oct. 13–Jan. 24			Cases, 2,000; deaths, from 1,000 to 1,200.
Tunis Regency				Total Nov. 25–Jan. 4: Cases, 462; deaths, 323. No cases since Jan. 10.
Beja district	Nov. 25–Dec. 21	71	20	
Bizerta district	Nov. 25–Dec. 5	9	15	
Turkey in Asia				Provinces in Asia and Europe, Apr. 16–Dec. 30, 1911: Deaths, 6,111, excluding Constantinople. Mainly among troops. Jan. 6–Feb. 27: Cases, 101; deaths, 126.
Acre	Jan. 21		33	In vicinity.
Adana	Dec. 2–Mar. 20	21	5	
Aleppo	Jan. 26–Mar. 9	36	23	
Amara	Oct 15	1	1	
Basra	Oct. 22–28	14	10	
Erzeroum, vilayet	Sept. 11–16	50	28	
Erzeroum	do	11	8	
Kalfa	Dec. 8			Present.
Kerbelah	Oct. 20–28	10	10	
Kharput	Nov. 19–Dec. 30	47	47	

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

Reports Received from Dec. 30, 1911, to Apr. 19, 1912.

CHOLERA—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Turkey in Asia—Continued.				
Jkidah	Dec. 2–24	323	310	
Mekka	Dec. 4–24	905	879	Sept. 1–Dec. 24: Cases, 1,648; deaths, 1,565.
Mersina	Dec. 1–7	2	1	
Osmania	Dec. 1–6	2	4	
Sinope	Dec. 7	2	1	
Tor	Dec. 14–26	29	.....	
Trebizond and vicinity	Sept. 18–23	64	34	
Tripoli	Jan. 4	.....	.....	Present.
Turkey in Europe:				
Constantinople	Oct. 24–Feb. 3	8	2	
Durazzo	Dec. 7–13	2	.....	
Janina	Jan. 14–22	17	8	
Loros	Jan. 22	12	7	
Saloniki, vilayet	Nov. 6–19	4	3	In Serres.

YELLOW FEVER.

Brazil:				
Bahia	Mar. 23	.....	.....	Present.
Ceara	Jan. 1–Feb. 29	.....	5	
Manaos	Nov. 19–Mar. 23	.....	49	
Para	Dec. 9–16	1	1	
Pernambuco	Jan. 1–Feb. 15	.....	10	
Canal Zone:				
Culebra Island quarantine	Jan. 1–31	1	.....	From a vessel from Guayaquil.
Chile:				
Tocopilla	Apr. 11	38	12	
Ecuador:				
Bucay	Nov. 16–Feb. 29	7	2	
Duran	Dec. 1–Feb. 29	13	6	
Guayaquil	Nov. 16–Feb. 29	118	54	
Huigra	Feb. 1–29	.....	.....	1 case.
Milagro	....do	16	7	
Naranjito	....do	2	2	
Yaguachi	....do	.....	.....	1 case.
Mexico:				
Espita	Dec. 31–Jan. 6	1	.....	
Kambul, hacienda	Feb. 21–27	.....	7	
Maxcanu	Dec. 31–Jan. 6	1	.....	
Merida	Nov. 12–Mar. 23	20	9	Total Aug. 1–Mar. 23: Cases, 65; deaths, 29.
Puerto Mexico (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–Feb. 15	30	13	
Macuto	Mar. 16–19	1	1	
Maiquetia	Feb. 24–Mar. 9	3	1	A suburb of La Guaira.
Sabana Grande	Dec. 12	.....	.....	Epidemic.
West Indies:				
St. Vincent	Feb. 19	1	.....	
At sea	Dec. 17–23	1	1	On a vessel en route from Manaos to Para.

PLAGUE.

Algeria:				
Philippeville	Oct. 19–Nov. 11	8	2	Including 5 cases, p. 2096, Vol. XXVI.
Azores:				
Fayal	Jan. 10	.....	.....	Still present.
Terceira	....do	.....	.....	Do.
Brazil:				
Bahia	Sept. 1–30	.....	2	
Para	Dec. 24–Feb. 17	18	12	
Pernambuco	Oct. 1–Feb. 15	.....	8	
Rio de Janeiro	Nov. 12–Feb. 10	7	3	
British East Africa:				
Kismayu	Oct. 15–25	2	.....	1 case pneumonic.

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

Reports Received from Dec. 30, 1911, to Apr. 19, 1912.

PLAGUE—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Chile:				
Iquique	Nov. 12–Mar. 27	12	6	
Pisagua	Nov. 1–30	8		
China:				
Amoy	Jan. 13		1	
Hongkong	Dec. 9–Mar. 2	38	32	
Dutch East Indies:				
Java				Total Mar. 1–Dec. 30: Cases, 1,817; deaths, 1,324.
Pasoeroean Residency, Malang District.	Nov. 12–Mar. 2	104	61	
Soerobaya	Oct. 17–27	2		
Ecuador:				
Duran	Feb. 1–29	1		
Guayaquil	Nov. 16–Feb. 29	124	52	Dec. 16–Jan. 31: Reports not available because of revolution.
Egypt				Total Jan. 1–Dec. 31, 1911: Cases, 1,656; deaths, 1,041, including cases previously reported.
Provinces—				
Assiout	Jan. 1–Mar. 15	45	30	Sept. 11–16: Cases, 50; deaths, 28.
Assouan	Jan. 1–Mar. 17	27	16	
Behera	Jan. 1–25	3	2	Sept. 11–16: Cases, 11; deaths, 8.
Beni Souef	Feb. 16–Mar. 14	17	7	
Fayoum	Jan. 1–26	1		
Galioubeh	Jan. 1–Mar. 10	4	3	Oct. 5–Dec. 26: Cases, 1.
Garbieh	Jan. 1–Mar. 4	15	6	
Girgeh	Feb. 28	1	1	
Kena	Jan. 1–Mar. 7	26	17	Nov. 20–Dec. 13: Cases, 3; deaths, 3.
Menouf	Feb. 2–Mar. 7	3	1	
Minieh	Jan. 1–Mar. 15	13	3	Dec. 13: Cases, 1.
German East Africa:				
Dar-es-Salaam	Nov. 13–15	1	1	From the interior via Bergamogo.
Hawaii:				
Honakaa	Feb. 9–Mar. 18	4	4	
India:				
Bombay	Nov. 19–Mar. 9	256	228	
Calcutta	Nov. 11–Feb. 17		224	
Karachi	Nov. 26–Mar. 9	322	268	Total year 1911: Cases, 3,273; deaths, 3,046.
Madras	Jan. 1–6	1	1	
Rangoon	Oct. 1–Dec. 31	50	50	
Bombay Presidency and Sind.	Oct. 29–Feb. 24	53,979	39,376	
Madras Presidency	do	9,171	7,166	
Bengal	do	22,567	18,954	
United Provinces	do	54,172	48,434	
Punjab	do	4,890	3,758	
Burma	do	1,042	939	
Eastern Bengal and Assam	Jan. 1–Feb. 24	2	2	
Central Provinces	Oct. 29–Feb. 24	18,383	14,620	
Coorg	do	88	52	
Mysore State	do	8,162	6,309	
Hyderabad State	do	23,295	21,218	
Central India	do	7,496	6,187	
Rajputana and Ajmere Merwara.	do	950	772	
Kashmir	Feb. 3–23	38	19	
North West Province	Oct. 29–Feb. 24	2	2	Total for India, Oct. 29–Feb. 24: Cases, 204,237; deaths, 167,808. Total year 1911: Cases, 828,535; deaths, 691,849.
Indo-China:				
Saigon	Nov. 13–Mar. 4	33	5	
Mauritius	Nov. 3–Mar. 8	64	34	
Persia:				
Buchir	Feb. 4–24	19	5	
Peru:				
Departments—				
Callao	Oct. 1–21	1		City, in November, 1 case; in January, 3 cases with 2 deaths; Mar. 1–26, 12 cases.
Chiclayo	do	12	4	
Chosica	do	1	1	
Lambayeque	do	3		
Libertad	do	8		Mar. 13, 30 cases in the lazaretto at Trujillo.
Lima	do	13	6	
Cebu quarantine station	Dec. 4	1		On s. s. Montrose from Shanghai

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

Reports Received from Dec. 30, 1911, to Apr. 19, 1912.

PLAGUE—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Russian Empire:				
Astrakhan, government	Sept. 21-Jan. 7	201	180	Including 73 cases and 63 deaths reported on page 2098, Vol. I.
Siam:				
Bangkok	Nov. 4-Jan. 27	.....	3	
South Africa:				
Durban	Jan. 14-Mar. 22	.....	.....	Total: Casse 23, deaths 18.
Straits Settlements:				
Singapore	Nov. 5-Feb. 10	26	23	
Turkey in Asia:				
Jiddah	Jan. 13-Feb. 2	6	1	
Venezuela:				
Caracas	Mar. 12	1	.....	
West Indies:				
Trinidad	Apr. 2-13	4	.....	
At sea	Mar. 1-11	1	1	On s. s. Macedonia from Bombay to Aden.

SMALLPOX.

Algeria:				
Algiers	Nov. 1-30	.....	1	
Oran	Jan. 1-31	2	1	
Arabia:				
Aden	Nov. 28-Mar. 24	17	8	And vicinity.
Argentina:				
Buenos Aires	Jan. 1-31	.....	2	Oct. 1-31, 6 deaths. No deaths in Nov. or Dec., 1911.
Rosario	Oct. 1-Jan. 31	.....	40	
Australia:				
Thursday Island	Jan. 2	1	.....	From s. s. Taiyuan.
Austria-Hungary:				
Bohemia	Jan. 14-20	2	.....	
Budapest	Jan. 4-10	25	.....	
Galicia	Dec. 24-Mar. 16	5	1	
Krain	Jan. 14-20	7	.....	
Trieste	Dec. 3-9	1	.....	From s. s. Baron Call from Beirut.
Tyrol	Jan. 14-Mar. 9	3	.....	
Brazil:				
Bahia	July 1-31	.....	1	
Pernambuco	Oct. 1-Feb. 15	.....	635	
Rio de Janeiro	Nov. 26-Feb. 24	18	1	
Santos	Dec. 12-23	.....	1	
Canada:				
British Columbia—				
Fernie	Feb. 26-Mar. 16	5	.....	
Nelson	Dec. 24-30	1	.....	
Victoria	Feb. 4-10	1	.....	
Manitoba—				
Winnipeg	Jan. 14-Apr. 6	2	.....	
Nova Scotia—				
Halifax	Mar. 24-Apr. 6	2	.....	
Ontario—				
Kingston	Dec. 19-23	1	.....	
Ottawa	Dec. 10-Mar. 23	91	.....	
Sarnia	Oct. 17-Mar. 23	43	.....	
Toronto	Jan. 6-Mar. 24	3	1	
Windsor	Feb. 4-Mar. 16	8	.....	
Quebec—				
Montreal	Dec. 17-Mar. 16	22	.....	
Quebec	Dec. 10-Mar. 30	262	2	
Ceylon:				
Colombo	Nov. 12-Feb. 10	3	.....	And vicinity.
Chile:				
Iquique	Dec. 10-Jan. 20	3	1	
La Serena	Nov. 21-30	14	.....	
Santiago	Nov. 1-30	685	343	
Talcahuano	Nov. 26-Dec. 23	14	3	
Valparaiso	Dec. 3-Mar. 9	68	.....	Feb. 17—Decreasing.
China:				
Canton	Nov. 11-Dec. 30	40	6	
Chenghai	Jan. 29-Mar. 16	.....	.....	Present.
Chungking	Nov. 18-Mar. 2	.....	.....	Do.
Dalny	Mar. 3-9	6	.....	

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

Reports Received from Dec. 30, 1911, to Apr. 19, 1912.

SMALLPOX—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
China—Continued.				
Hankow	Jan. 21–Feb. 17	2	1	
Hongkong	Nov. 12–Mar. 2	503	371	
Kityang	Jan. 21–Mar. 16			Present.
Nanking	Dec. 10–Mar. 16			Do.
Shanghai	Dec. 11–Feb. 18	1	6	Deaths among natives.
Swatow	Mar. 2			Present.
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–Mar. 4	4	1	
Port Said	Jan. 30–Feb. 4	1		
France:				
Havre	Mar. 10–16		4	
Marseille	Jan. 1–Feb. 29		4	Nov. 1–30, 1 death.
Paris	Dec. 3–Mar. 16	113	2	
Germany				Total, Dec. 31–Mar. 23: Cases. 63.
Hamburg	Jan. 21–27	1		
Gibraltar	Feb. 27–Mar. 3	1		
Great Britain:				
Bristol	Jan. 29–Feb. 3	2		
Liverpool	Mar. 17–23	1		
London	Jan. 14–Feb. 24	6	1	
Southampton	Mar. 3–9	1		
West Hartlepool	Feb. 18–Mar. 9	2		
India:				
Bombay	Nov. 19–Mar. 9	466	223	
Calcutta	Nov. 19–Feb. 17		23	
Madras	Nov. 26–Mar. 9	142	58	
Rangoon	Oct. 1–Dec. 31	61	17	
Indo-China:				
Saigon	Nov. 13–Mar. 4	37	7	
Italy:				
Genoa	Dec. 1–Mar. 15	45	2	
Leghorn	Dec. 16–Mar. 16	95	1	
Messina	Nov. 19–Jan. 31		6	
Naples	Dec. 3–Mar. 25	91	1	
Palermo	Nov. 26–Mar. 23	2,599	885	
Turin	Jan. 15–Mar. 24	8		
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.
Nagasaki	Feb. 12–18	1		
Yokohama	Jan. 22	1		From s. s. Hydra from New York via Suez.
Java:				
Batavia	Nov. 12–Mar. 2	43	12	
Malta	Dec. 24–Jan. 6	2	1	
Mexico:				
Aguascalientes	Dec. 18–Mar. 3		7	
Chihuahua	Nov. 20–Feb. 11	92	36	
Coahuila, State	Oct. 1–30		16	
Guadalajara	Jan. 14–Apr. 6	6	2	
Juarez	Dec. 19–Mar. 9	14	5	
Magdalena	Dec. 23–Mar. 12	91	50	Mar. 12, 10 cases present.
Manzanillo	Feb. 18–24	1		
Mazatlan	Dec. 11–Mar. 19		11	Mar. 16, 25 cases in the lazaretto.
Mexico	Nov. 26–Feb. 17	135	67	
Monterey	Dec. 11–24		2	
Porfirio Diaz	Dec. 3–Mar. 23		35	
Salina Cruz	Feb. 11–Mar. 9	4	2	Mar. 23, present in vicinity.
San Antonio	Jan. 1–21	12	9	
San Carlos	....do			Present.
Sandoval	Dec. 16			Do.
San Ignacio	Jan. 8	3		
Saric	Jan. 21–27		6	
Santa Ana	Jan. 8	4		
San Luis Potosi	Nov. 12–Feb. 10	4	1	
Tampico	Dec. 1–Mar. 30		15	
Tapachula	Nov. 1–Jan. 31		18	
Philippine Islands				Third quarter, 1911: Manila, 9 cases; no deaths.

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

Reports Received from Dec. 30, 1911, to Apr. 19, 1912.

SMALLPOX—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Portugal:				
Lisbon	Dec. 9–Mar. 19	49	.....	
Russia:				
Batum	Dec. 1–31	1	.....	
Libau	Dec. 17–23	1	.....	
Moscow	Nov. 19–Mar. 9	47	3	
Odessa	Nov. 26–Mar. 16	24	1	
Reval	Nov. 1–30	1	.....	
Riga	Dec. 24–Jan. 27	16	.....	Oct. 1–Nov. 30; deaths, 2.
St. Petersburg	Nov. 19–Mar. 16	159	29	
Warsaw	Nov. 5–Feb. 10	.....	283	
Siam:				
Bangkok	Nov. 5–Jan. 27	.....	1,326	
Siberia:				
Omsk	Jan. 1–31	7	.....	
South Africa:				
Durban	Jan. 21–Feb. 24	4	.....	
Johannesburg	Jan. 7–Feb. 10	36	.....	
Spain:				
Barcelona	Feb 6–12	.....	1	
Cadiz	Nov. 1–Feb. 29	.....	27	
Madrid	Dec. 1–Jan. 31	.....	3	
Malaga	Nov. 1–30	.....	45	
Seville	Dec. 1–Feb. 29	.....	8	
Valencia	Dec. 3–Mar. 23	293	13	
Straits Settlements:				
Penang	Feb. 11–17	1	.....	
Singapore	Nov. 19–Feb. 17	26	10	
Switzerland:				
Cantons—				
Oberwalden	Jan. 14–20	1	.....	
Zurich	Dec. 3–23	6	.....	
Teneriffe:				
Santa Cruz	Dec. 3–Mar. 16	.....	48	
Turkey in Asia:				
Beirut	....do	1,335	102	
Turkey in Europe:				
Constantinople	Dec. 4–Mar. 24	.....	128	
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.
Aberdeen	Mar. 16	163,084	55	....	....	....	....	....	....	....	1	....	1	....
Aguascalientes	Apr. 7	40,000	56	....	....	....	....	....	3	1	....	....	4	....
Aix la Chapelle	Mar. 16	157,578	74	9	....	....	....	....	1	....	....	....	1	1
Amsterdam	Mar. 30	582,586	129	26	....	....	....	....	....	1	....	2	4	3
Antwerp	Mar. 23	316,604	72	6	....	....	....	....	....	....	1	....	1	3
Athens	...do	250,010	73	31	....	....	....	....	....	....	3	....	....	....
Barmen	...do	171,200	.....	5	....	....	....	....	....	....	....	....	1	....
Batavia	Mar. 2	217,630	.....	....	....	....	....	....	1	....	....	....	....	....
Belfast	Mar. 30	385,492	145	24	....	....	....	....	....	....	....	....	....	10
Belgrade	Mar. 23	90,050	29	....	....	....	....	....	....	....	....	1	....	....
Berlin	Mar. 16	2,085,258	646	103	....	....	....	....	....	1	4	28	14	1
Bordeaux	Mar. 30	253,000	100	10	....	....	....	....	....	....	....	....	5	....
Bremen	Mar. 16	246,850	87	16	....	....	....	....	....	....	4	1	7	....
Brunswick	...do	145,000	.....	3	....	....	....	....	....	2	3	7	....	....
Brussels	Mar. 23	739,684	175	26	....	....	....	....	....	....	1	....	3	1

MORTALITY—Continued.

Weekly mortality table, foreign and insular cities—Continued.

Cities.	Week ended—	Estimated population.	Total deaths from all causes.	Deaths from—									
				Tuberculosis.	Plague.	Cholera.	Yellow fever.	Smallpox.	Typhus fever.	Typhoid fever.	Scarlet fever.	Diphtheria.	Measles.	Whooping cough.
Budapest	Mar. 16	1,000,000	.....	....	....	....	....	....	....	....	4	1	2	....
Catania	Mar. 29	207,000	.....	3	....	....	....	....	....	....	....	1	1	....
Christiana	Mar. 30	246,000	98	13	....	....	....	....	....	....	1	1	1	1
Coburg	Mar. 23	23,794	10	1	....	....	....	....	....	....	....	....	....	1
Cologne	..do....	527,663	175	25	....	....	....	....	....	....	1	3	....	5
Constantinople	Mar. 24	1,000,000	328	....	....	....	....	14	....	6	6	....	3	....
Copenhagen	Mar. 16	465,000	139	17	....	....	....	....	....	....	1	3	1	3
Dresden	..do....	556,200	144	24	....	....	....	....	....	1	1	....	....	1
Do	Mar. 23	.....	142	16	....	....	....	....	....	....	2	3	....	1
Dublin	Mar. 16	406,536	.....	35	....	....	....	....	....	3	....	5	7	....
Do	Mar. 23	.....	203	34	....	....	....	....	....	1	2	3	6	....
Edinburgh	Mar. 23	321,200	111	11	....	....	....	....	....	....	....	1	9	1
Do	Mar. 30	316,200	80	....	....	....	....	....	....	....	1	....	4	1
Frankfort on the Main	Mar. 16	423,600	93	....	....	....	....	....	....	....	....	3	....	....
Ghent	..do....	166,235	67	8	....	....	....	....	....	....	....	....	....	1
Glasgow	Mar. 23	785,600	283	....	....	....	....	....	....	2	1	4	22	6
Do	Apr. 5	.....	277	....	....	....	....	....	....	....	3	2	27	14
Gothenburg	Mar. 23	170,100	56	15	....	....	....	....	....	....	....	1	....	1
Guadalajara	Apr. 6	119,468	82	....	....	....	....	....	....	....	1	....	....	....
Halifax	Mar. 30	46,000	20	1	....	....	....	....	....	....	....	....	....	....
Do	Apr. 6	.....	14	2	....	....	....	....	....	....	....	1	....	....
Hamburg	Mar. 23	953,079	259	30	....	....	....	....	....	....	3	10	1	3
Hongkong	Mar. 2	336,488	.....	....	6	....	....	65	....	2	....	....	....	....
Kharput	Mar. 16	21,000	.....	....	....	....	....	....	....	1	....	....	1	....
Konigsberg	..do....	252,200	110	17	....	....	....	....	....	....	....	....	2	3
Libau	Mar. 24	84,000	.....	....	....	....	....	....	....	....	1	....	....	....
Leeds	Mar. 30	445,568	105	15	....	....	....	....	....	....	....	....	2	....
Leipzig	Mar. 23	605,755	157	23	....	....	....	....	....	1	....	1	1	2
Leith	Mar. 30	81,000	19	....	....	....	....	....	....	....	....	....	6	1
Liege	Mar. 23	167,630	50	4	....	....	....	....	....	1	3	....	....	....
Liverpool	Mar. 30	752,055	256	22	....	....	....	....	....	....	....	3	3	6
London	..do....	7,340,125	1,716	....	....	....	....	....	....	1	3	20	18	44
Montreal	Apr. 6	466,197	193	28	....	....	....	....	....	1	3	1	1	7
Moscow	Mar. 9	1,500,000	735	103	....	....	....	1	1	2	19	6	17	9
Nantes	Mar. 24	170,535	71	21	....	....	....	....	....	1	....	....	....	....
Palermo	Mar. 23	340,000	177	10	....	....	....	....	....	12	2	....	....	....
Port Elizabeth	Mar. 2	30,692	15	2	....	....	....	....	....	1	....	1	....	....
Port of Spain	Mar. 16	60,000	36	4	....	....	....	....	....	1	....	....	....	1
Prague	..do....	225,204	107	22	....	....	....	....	....	....	....	2	7	....
Do	Mar. 23	.....	118	22	....	....	....	....	....	3	....	....	6	....
Quebec	Apr. 6	78,200	.....	1	....	....	....	....	....	....	....	....	....	....
St. Petersburg	Mar. 16	907,708	745	125	....	....	....	4	1	9	19	8	21	5
San Luis Potosi	Feb. 3	82,476	.....	2	....	....	....	....	....	4	....	1	1	....
Do	Feb. 10	.....	63	9	....	....	....	....	....	1	....	....	....	1
Southampton	Mar. 30	120,896	24	2	....	....	....	....	....	....	....	....	1	....
Stettin	Mar. 23	240,000	83	11	....	....	....	....	....	....	....	2	....	....
Stoke-on-Trent	Mar. 20	237,153	78	10	....	....	....	....	....	....	2	4	....	....
Tampico	Mar. 30	23,252	44	....	....	....	....	1	....	....	....	1	....	1
Tientsin	Mar. 16	465,000	24	7	....	....	....	....	....	....	....	....	....	1
Toronto	Mar. 23	392,000	127	8	....	....	....	....	....	1	1	2	....	2
Do	Mar. 30	.....	148	5	....	....	....	....	....	1	....	2	1	....
Do	Apr. 6	.....	96	3	....	....	....	....	....	....	1	....	....	....
Trieste	Mar. 16	232,822	111	....	....	....	....	....	....	1	....	....	6	....
Valencia	Mar. 23	235,000	122	4	....	....	....	....	....	....	....	....	....	....
Veracruz	Mar. 23-30	32,000	31	14	....	....	....	....	....	....	....	....	....	....
Vienna	Mar. 16	2,064,583	707	95	....	....	....	....	....	1	5	3	6	3
Winnipeg	Apr. 6	151,958	68	4	....	....	....	....	....	....	....	2	3	....

MORTALITY FOREIGN AND INSULAR COUNTRIES AND CITIES
(Untabulated.)

BRITISH EAST AFRICA—*Mombasa.*—Month of February, 1912. Population, 26,000. Total number of deaths from all causes 37, including tuberculosis 2.

GREAT BRITAIN.—Week ended March 23, 1912:

England and Wales.—The deaths registered in 77 great towns correspond to an annual rate of 14.1 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 20.7 per 1,000 of the population, which is estimated at 1,157,014. The lowest rate was recorded at Waterford, viz, 7.6, and the highest at Dundalk, viz, 43.7, per 1,000.

Scotland.—The deaths registered in 18 principal towns correspond to an annual rate of 17.4 per 1,000 of the population, which is estimated at 2,182,400. The lowest rate was recorded at Partick, viz, 5.3, and the highest at Kilmarnock, viz, 25.5, per 1,000. The total number of deaths from all causes was 726, including diphtheria 9, measles 50, scarlet fever 5, typhoid fever 2.

ITALY—*Genoa.*—Two weeks ended March 31, 1912. Population, 272,077. Total number of deaths from all causes 199, including diphtheria 4, tuberculosis 20.

NEW ZEALAND.—Month of December, 1911.

Auckland.—Population, 102,676. Total number of deaths 81, including tuberculosis 2.

Christchurch.—Population, 80,193. Total number of deaths 40, including tuberculosis 4.

Dunedin.—Population, 61,828. Total number of deaths 42, including tuberculosis 3.

Wellington.—Population, 70,729. Total number of deaths 58, including tuberculosis 5, typhoid fever 1.

PANAMA—*Panama.*—Month of March, 1912. Population, 30,000. Total number of deaths from all causes not reported. The deaths include diphtheria 1, tuberculosis 11.

SPAIN—*Almeria.*—Month of March, 1912. Population, 50,910. Total number of deaths from all causes 127, including tuberculosis 11, typhoid fever 2.

TRIPOLI—*Tripoli.*—Two months ended March 31, 1912. Population, 50,000. Total number of deaths from all causes 509, including measles 3, tuberculosis 13, typhoid fever 28.

TURKS ISLANDS.—Two weeks ended April 6, 1912. Population, 1,675. One death. No contagious diseases.

VENEZUELA—*La Guaira.*—Two weeks ended March 15, 1912. Population, 10,000. Total number of deaths from all causes 13, including tuberculosis 2, typhoid fever 1.

By authority of the Secretary of the Treasury:

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

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