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PUBLIC HEALTH REPORTS

VOL. 43 August 31, 1928 NO. 35

MARINE HOSPITAL PATIENTS AND OTHER BENEFICIARIES OF THE PUBLIC HEALTH SERVICE

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Inquiries are frequently received concerning the hospitals and relief stations operated by the Public Health Service and the persons entitled to treatment. The beneficiaries include many different classes. Some are entitled only to physical examination or vaccination, and others, to hospital and out-patient treatment; certain beneficiaries are treated free, whereas others are pay patients; some patients are admitted to treatment only upon the request of another Government department, while others need but to identify themselves. A patient may have a dual status as a beneficiary; for instance, a veteran of the World War employed as a seaman or as a lighthouse keeper, disabled as a direct result of his vocation.

American merchant vessels—not the fighting ships of the Navy, but the humble craft owned chiefly by private citizens—that carry passengers and freight across the oceans, up and down the coasts, and on our inland lakes and rivers, send their sick and disabled seamen to the marine hospitals and other relief stations of the Public Health Service. Occasionally, however, a man locally reputed to be a sailor is denied these medical benefits and an inquiry is received as to the reasons therefor. Frequently the answer is that the claimant had abandoned his vocation as a seaman more than the conventional two months previously. It is perplexing to the average citizen to see a member of the civilian crew of an Army transport taken to a marine hospital when a military ambulance is receiving an officer or an enlisted man from the same vessel for the Army hospital, while perhaps from the same dock a battleship or a submarine is sending a disabled bluejacket to the naval hospital. It may also seem paradoxical that a United States marine goes, when sick, to the naval hospital instead of to a marine hospital, and that a disabled Coast Guard man, whether from ice or seal patrol, life-saving station, or rum chaser, goes to the marine hospital perhaps along with injured

members of the crew of a rum runner, if the latter is (as rarely happens) an American documented vessel.

The medical services of the Public Health Service are extensive, involving the annual expenditure of more than $5,500,000 in 150 cities in the United States and its possessions, chiefly, of course, in the great shipping ports. There are 25 marine hospitals serving the largest ports and 165 contract hospitals in smaller ports.[1] Out-patient treatment is provided in all places where hospital care is authorized. Each year approximately 355,000 patients are treated or given special physical examinations not connected with treatment. About 632,000 out-patient treatments are given and 1,300,000 hospital days are furnished each year. More than 300 full-time medical and dental officers, 400 trained nurses, physiotherapy aides, and dietitians, and 1,600 other hospital employees are on duty. There are also 400 part-time physicians, including those in small ports and consultants in the specialties serving the marine hospitals.

Temporary hospital care only is contemplated according to the language of the original act. The aged and chronically infirm, suitable for domiciliary care, but not in need of hospital treatment, are not usually considered admittable to hospital, and neither are those with minor disabilities who can be treated as out patients. These restrictions do not apply to lepers under treatment at the National Leprosarium, Carville, La., who also receive clothing, tobacco, etc., and, when cured, may be transported to their homes, perquisites denied to all other classes of patients. There are three classes of beneficiaries, namely, Coast Guard, Coast and Geodetic Survey, and the Lighthouse Service, who may be treated at the expense of the Public Health Service, even in places where no formal arrangements exist. One class only, the Coast Guard, may be thus treated in foreign ports. Other American seamen in foreign ports, when sick or injured, are cared for at the expense of their vessels, but, signed off from the vessels and becoming destitute, they are charges of the State Department and may be repatriated by an American consul.

When the Fifth Congress, second session, enacted the law approved on July 16, 1798, by President Jefferson, creating the marine hospitals and other medical relief stations for seamen from American merchant vessels, a sickness and accident insurance, of a sort, was established for a particular industry—the first of its kind in the New World. There was evidenced, moreover, the purpose and intent of the Congress to relieve American vessels of a responsibility and expense which, by ancient maritime law and custom, otherwise rests with the ship. Finally, there was the provision, necessary then as now, to care for a class of sick and disabled, often remote from their homes, in places

[1] A list of relief stations may be had upon application to the Surgeon General.

where they might otherwise constitute a community burden and a health hazard. Between 1798 and 1884 the sailors themselves contributed, as the law required, at first 20 cents, and, after 1870, 40 cents per month. These contributions, or assessments, collected for 86 years by the customs officers aggregated $15,794,807.63, all of which was used to build the marine hospitals and maintain the medical services. During this period $19,622,371.87 was expended by the Government for the purpose, or somewhat more than the amount collected from the sailors. The old marine hospital property at Cleveland, Ohio, recently sold for $1,954,000, out of which a new marine hospital is being built, was purchased in 1837 for $12,000 of "sailors' money." It is not unnatural that seamen, especially those

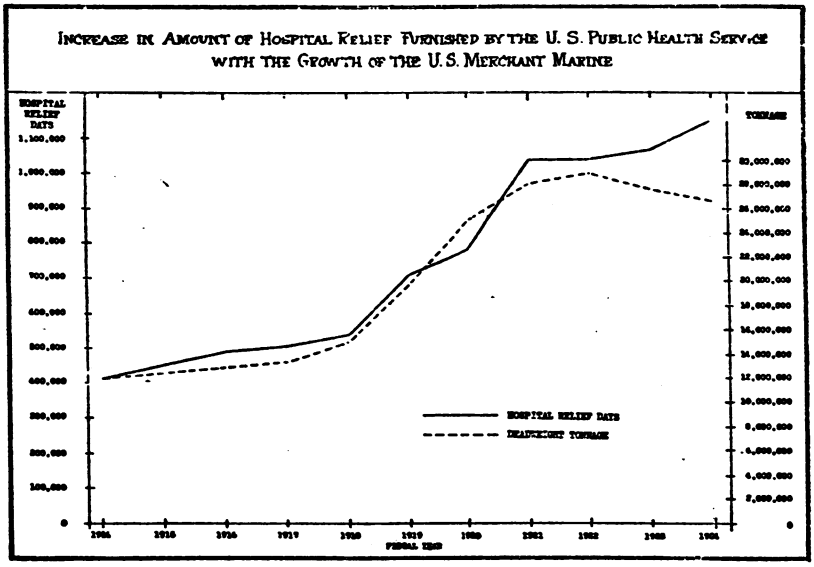

FIG. 1.—Comparison of increase in hospital relief with increase in growth of the merchant marine

who still recall the days when they gave from their monthly wages to the marine hospital fund, do not approve the diversion of money received from such sales to any other purpose than that of constructing marine hospitals.

Since 1884 the sailor has been relieved of direct contributions for the maintenance of medical relief furnished by the Public Health Service, the expense of which was at that time shifted to the tonnage tax imposed by the act of June 26, 1884, upon American and foreign ships. Although this tonnage tax has, since 1906, been devoted to the general income of the Government instead of to the specific purpose for which it was originally designed, it still constitutes an important source of revenue, having yielded $14,920,618.35 between

1885 and 1906 and an increasing amount, relatively, since that period, as is seen below:

Fiscal year	Tonnage tax	Fiscal year	Tonnage tax
1907	$1,044,781.13	1918	$1,163,683.90
1908	1,076,571.69	1919	1,257,287.99
1909	1,052,374.37	1920	1,696,012.52
1910	1,081,526.70	1921	2,175,902.49
1911	1,083,255.34	1922	1,802,853.52
1912	1,156,010.75	1923	1,673,887.77
1913	1,259,434.63	1924	1,699,645.15
1914	1,338,973.63	1925	1,799,846.82
1915	1,304,545.15	1926	1,816,091.50
1916	1,442,281.45	1927	2,222,283.01
1917	1,386,940.56		

Seamen from American merchant vessels are treated by dental and medical officers in any port where there is a relief station. The United States Public Health Service, originally the Marine Hospital Service, the sole function of which was the medical care of merchant seamen, has taken on many other duties, but it has always considered itself an important agency in the promotion of the welfare of American sailors and American ships. When, as sometimes happens, the marine hospital wards are filled and admissions are difficult, other classes of beneficiaries may be sent to other institutions, but the door is always kept open to merchant seamen. The relation between the growth of the American merchant marine and the medical services furnished is shown in the accompanying illustration.

BENEFICIARIES OF THE PUBLIC HEALTH SERVICE

ENTITLED TO HOSPITAL AND OUT-PATIENT TREATMENT

Seamen from American merchant ships.—A seaman is a person engaged in the care or navigation of vessels, or in the service, aboard, of persons so engaged. He must be a bona fide seaman and actually so employed or recently (within 60 days) have been so employed. If he abandons the vocation, his previous employment as a seaman does not continue his eligibility, although the closing of navigation by ice or low water may affect it temporarily. He must apply in person or by proxy to the Government officer in charge of an established relief station in a port designated by the Secretary of the Treasury, and is not entitled to treatment at Government expense in other ports or places. He must identify himself as a seaman by a certificate from the master or owner of the vessel or by affidavit. The ship must be of American registry and documented.

There are, according to data published by the Department of Commerce, approximately 200,000 American seamen, including those from both privately owned and Government owned merchant ships. Of these, more than 100,000 seek treatment each year in marine hos-

pitals and out-patient offices. They constitute 58 per cent of the hospital patients and receive 67 per cent of the total hospital relief supplied. They also receive nearly 300,000 out-patient treatments each year. Although admissions to hospital are restricted to major sickness and injury, the fact that seamen are frequently disabled long distances from their homes makes hospital care imperative both for acute diseases and during convalescence. The marine hospital for tuberculous patients at Fort Stanton, N. Mex., is reserved almost exclusively for merchant seamen who are transferred from the other marine hospitals. About one-half of all tuberculous seamen are found suitable for treatment at that place, which has an altitude of more than 6,000 feet above sea level. Approximately 700 seamen die in marine hospitals each year. The remains of seamen dying in hospital (but not of seamen dying elsewhere) are buried by the Public Health Service. If claimed by relatives, the service is not authorized to bear any part of the expense of interment.

United States Coast Guard.—Officers and men of the Coast Guard, numbering approximately 12,000, rank second in numerical importance as regards medical relief. Eighteen thousand complete physical examinations are made annually for purposes of recruiting, promotion, and retirement, and there are about 4,000 admissions to hospital each year from this corps, the members of which are at all times subject to military discipline and are usually kept in hospital until complete recovery instead of being discharged to their homes for convalescence. Medical and dental officers of the Public Health Service are also assigned to the cruising cutters and important shore stations of the Coast Guard for general professional duties.

A Coast Guard man's eligibility for treatment ceases when he is discharged from the service, except for members of the permanent corps on a retirement status, who may be treated as out-patients and admitted to marine hospitals, but not contract hospitals. A Coast Guard man is not a beneficiary of the Employees' Compensation Commission for injuries incurred in line of duty. There is a provision for the shipment home, at the expense of the Coast Guard, of the remains of Coast Guard personnel who die in hospital. For no other class of beneficiary except patients of the United States Veterans' Bureau is such provision made.

United States Employees' Compensation Commission.—Federal employees injured or otherwise disabled as the result of official occupation are admitted to treatment at the request of a responsible official superior whose belief that the disability was incurred in line of duty must be certified on a prescribed form upon which treatment by a Government physician is requested. The decision, often difficult, as to whether a disease, such as tuberculosis, resulted from the employment, rests in each instance with the Employees' Compensation

Commission. More than 46,000 Federal employees are treated annually, the great majority as out-patients, because these workers are usually employed near home. Ten thousand complete physical examinations, often requiring specialistic assistance, are made annually and forwarded to the Employees' Compensation Commission. More than 140,000 out-patient treatments are furnished each year.

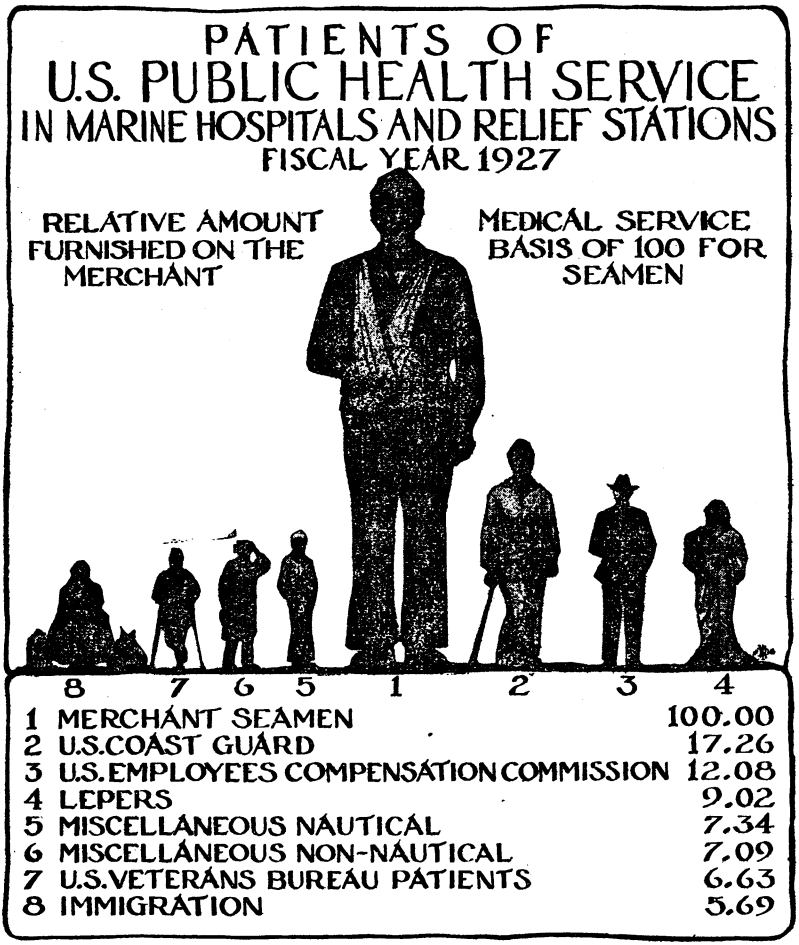

FIG. 2.—Graphic representation of relative amount of medical service furnished beneficiaries

Confusion sometimes arises on the part of contractors, whose employees, although on Government projects, are not entitled to medical services or compensation from the Government as are Government employees proper.

United States Veterans' Bureau.—Veterans, especially when residing in ports remote from Veterans' Bureau hospitals, are admitted to marine hospitals or given out-patient treatment or physical examina-

tions by the Public Health Service upon the request, in each instance, of a local representative of the Veterans' Bureau. For the expense of hospital and medical care, the Public Health Service is reimbursed out of the appropriations made to the Veterans' Bureau.

Many applications for treatment, all of which are referred to the Veterans' Bureau, are still received direct from veterans, because of the fact that between March 3, 1919, and May 1, 1922, the Public Health Service was designated by Congress as the principal agent to furnish these medical services, and during that period treated 275,000 veterans, to whom were given 14,500,000 relief days in marine hospitals and other institutions, 2,000,000 out-patient treatments, and 1,500,000 physical examinations.

Lepers.—Any leper residing in the United States who desires treatment at the National Leprosarium at Carville, La., may be admitted thereto. Approximately 300 patients are now receiving treatment there, the majority of whom applied voluntarily for admission. Others were transferred, sometimes against their wishes, when intercepted at quarantine stations of the Public Health Service or at the request of State health officers. A condition imposed upon all is that they may not leave Carville until cured. Eleven leper patients were so discharged during the fiscal year 1928.

Immigrants.—In addition to making the medical inspection of immigrants arriving in the United States and of intending emigrants abroad, the Public Health Service is authorized to admit detained aliens to marine hospitals at the request of the Bureau of Immigration. The marine hospital at Ellis Island, N. Y., is partly reserved for such patients, whose hospital expenses are collected from the ship which entered them and are deposited in the United States Treasury. About 5,000 immigrants are admitted each year to marine hospitals, usually for short periods of treatment.

Foreign seamen.—Seamen from foreign vessels are admitted as pay patients, the consul or the ship's master becoming a surety for the funds which, when collected by the collector of customs, are turned into the United States Treasury.[2] In the act of March 3, 1875, Congress fixed 25 cents per day as the charge to be made for the per diem cost of hospital care of foreign seamen, but authorized the Secretary of the Treasury to adjust the rate, which at present is $3.80 per patient per day, or approximately the actual cost of treatment in marine hospitals. The cost of out-patient treatment for foreign seamen has been similarly fixed at $1.

Civilian seamen, vessels of the United States Army.—Nonenlisted men employed on Army transports and vessels of the Engineer Corps, many of which are engaged in river and harbor improvements, are

[2] From all pay patients, of which immigrants and seamen from foreign vessels are the principal classes, approximately $165,000 is collected and turned into the Federal Treasury annually.

beneficiaries, with status similar to that of seamen from American merchant vessels.

Seamen, Mississippi River Commission.—Persons engaged in the care and navigation of the Government-owned barges and other vessels of the Mississippi River Commission are beneficiaries, and the responsibility for their medical care is placed on the Public Health Service. The personnel of quarter boats and similar moored craft are excluded, although they may have a status with the Employees' Compensation Commssion if disabled as a direct result of official duties.

United States Coast and Geodetic Survey.—Officers and men from the vessels operated by this corps, a personnel of 650, have the same status as Coast Guard personnel, except in minor particulars. These vessels do not carry medical officers.

United States Lighthouse Service.—By special acts of Congress, lighthouse keepers who pass a prescribed physical examination upon entering the service have been made eligible for treatment by the Public Health Service. Other keepers and all other lighthouse personnel are not beneficiaries, except those manning the lighthouse vessels, who have the same status as seamen from merchant vessels. The Public Health Service is also required to provide medical supplies for lighthouse vessels, a provision not made for any other vessels except those of the Coast Guard.

United States Bureau of Fisheries.—Officers and crews from these vessels, only 18 in number, with a total personnel of 100 persons, were made beneficiaries by a special act of Congress.

Army, Navy, and Marine Corps.—Upon official request, officers and enlisted men of the Military and Naval Establishments are admitted to marine hospitals and given treatment in all places where there is a Public Health Service relief station.

United States Public Health Service.—Officers, nurses, and other employees of this service on duty in marine hospitals, quarantine stations, and elsewhere in the field, have limited rights as beneficiaries. They are, according to a comptroller's decision, eligible for treatment in marine hospitals proper, but not in contract hospitals or when an expense for treatment is incurred.

ENTITLED TO VACCINATION AGAINST SMALLPOX AND TYPHOID FEVER

Federal employees engaged in interstate travel or handling mail.—Railway mail clerks and certain other post-office employees are the principal beneficiaries in this group, but other Federal employees engaged in field work or proceeding abroad are sometimes included.

ENTITLED TO PHYSICAL EXAMINATION ONLY

Physical examinations, of which more than 100,000 are made each year, are only those for which special written reports are made to

comply with specific requests. They do not include the more numerous physical examinations related to treatment of patients, although some beneficiaries who are entitled to treatment are included in the following classes:

Pilots, masters, mates, and engineers.—The Steamboat Inspection Service, Department of Commerce, requires all applicants for license to pass a satisfactory test for vision and color vision, which is an important factor of safety in the navigation of ships. More than 6,000 applicants are so examined annually, of whom between 3 and 4 per cent are found to have defective color vision and, hence, incapable of distinguishing the common signals used at sea. An examination is also made of these applicants for proficiency in the principles of first aid to the sick and injured.

These examinations are all made by the Public Health Service, the visual tests (6,000 per year) at any marine hospital or other relief station and the first aid tests (2,000 annually) at 45 relief stations, selected by the Steamboat Inspection Service, where instruction in first aid is also given to classes preliminary to the examination.

Able-bodied seamen.—The seamen's act of 1915 requires that 65 per cent of all seamen manning an American vessel must approach a satisfactory health standard and be physically competent to perform certain emergency duties. Of 40,000 such seamen examined annually, a considerable number is rejected for defective vision and color vision, diseases of the heart, venereal diseases, and other physical defects.

Seamen food handlers.—To aid in the enforcement of interstate quarantine laws which require the exclusion from employment on common carriers of food handlers who are disease carriers, the Public Health Service makes examinations of cooks, waiters, and other food handlers aboard ship at the request of the master or owner. These examinations may also be made by private physicians.

Civil service applicants for appointment and retirement.—The preliminary medical certificate which is sometimes, but not always, required by the Civil Service Commission when an applicant applies for civil service examination, is often furnished by a private physician selected and paid by the applicant. After being placed on the civil service list of eligibles and selected for a position, an applicant is required, before entering on his duties, to pass a physical examination which is made by a medical officer of the Federal service. The Public Health Service performs approximately 22,000 of these examinations each year, including those made in connection with the administration of the civil service retirement act.

The advantages of having a physical examination made by a Public Health Service officer before an employee goes on duty for the Government is obvious. A confidential record is made of conditions that

might later cause disability and these records are useful not only in placement of the employee with due regard for his physical strength, but in settling claims for compensation that may subsequently be made to the Employees' Compensation Commission.

Civil service employees suspected of having communicable diseases.—A Government employee suspected of having tuberculosis or other communicable disease may, upon competent request, be examined by a medical officer of the Public Health Service to determine whether he is a menace to fellow employees. Report is made of the conditions found, but a Federal employee is not excluded from employment by the Civil Service Commission except under circumstances where he constitutes a health hazard that can not be overcome by rearrangement of duties.

Applicants for military pensions.—Upon request of the Bureau of Pensions, applicants are examined by officers of the Public Health Service and reports are rendered. These examinations may also, at the discretion of the Bureau of Pensions, be performed by other physicians.

Longshoremen.—At the request of a field agent of the Employees' Compensation Commission, the Public Health Service makes physical examinations of longshoremen to adjust medical controversies arising in the enforcement of the longshoremen and harbor workers' compensation act of 1927. These examinations, as with all those required by the Employees' Compensation Commission for the determination of compensability, are usually very complete, frequently calling for X-ray and other laboratory reports and assistance from medical specialists.

Officers' Reserve Corps, United States Army, and Citizens' Military Training Camps.—Examinations in this group are made at the request of the Army in ports and places where the military organization lacks facilities.

Air pilots.—Upon request of the Department of Commerce, examinations of air pilots are made at certain designated marine hospitals where the necessary special equipment is provided.

MICROSCOPIC PATHOLOGY ATTENDING EXPOSURE OF GUINEA PIGS TO VAPORS OF ETHYL BROMIDE[1]

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This report describes the microscopic pathology found in guinea pigs exposed to vapors of ethyl bromide in air, and supplements a

[1] Published by permission of the Director of the U. S. Bureau of Mines.

previous report[2] dealing with the physiological response attending exposure to vapors of alkyl halides. In the latter are given the detailed test data, technique of making exposure, symptoms, and gross pathological findings. Succeeding reports will be made relative to the microscopic pathology attending exposure to ethyl chloride, methyl chloride, and methyl bromide.

Briefly, the animals were exposed in groups of six (except in a few instances when only three were used) to a predetermined condition as regards concentration of vapors and period of time. In setting up the conditions of exposure it was aimed to cover the range of concentrations of vapors from exceedingly high to low amounts, and in each case to vary the period of exposure from that which caused no deleterious response to that which caused moderate and serious response. Immediately after the termination of the exposure, at least two animals of each group were examined for gross pathological changes, and specimens of the lungs, heart, liver, pancreas, spleen, kidneys, and suprarenals were taken for microscopic study. If one or more animals died during the period of exposure, they were included in the number autopsied at this time; but more often none died, and the animals taken for autopsy were killed by injecting approximately 2 cubic centimeters of saturated solution of magnesium sulphate into the heart.

The animals remaining were observed for three to four days, and all that died were autopsied as before. If none of the animals or less than half died in this time, one or two more were killed. Then, at the end of seven to eight days, the animals remaining were killed and examined. In all cases, regardless of whether the animal died or was killed, gross pathological examination was made and specimens of tissue were taken for microscopic study.

In these experiments approximately one-third as many control animals as exposed animals were killed and similarly examined. No control or stock animals died. With but few exceptions the pathology of the controls was practically normal, and the results given in this report are deviations from the controls as well as from the expected normal.

MICROSCOPIC PATHOLOGY

A careful study of the microscopic pathology in guinea pigs after exposure to vapors of ethly bromide reveals certain characteristic changes in the tissues which can be correlated with the conditions of exposures as regards the concentration of vapors and the period of exposure. So as to bring out this correlation more clearly, the

[2] Sayers, R. R., Yant, W. P., Thomas, B. G. H., and Berger, L. B.: "The Physiological Response Attending Exposure to Vapors of Methyl Bromide, Methyl Chloride, Ethyl Bromide, and Ethyl Chloride." Report of the Bureau of Mines to the National Research Council and Dow Chemical Co. (To be published.)

description of the findings is divided into two parts; namely, that caused by exposure to relatively high concentrations for short periods, and that caused by exposure to relatively low concentrations for long periods.

PART I. PATHOLOGY FOUND AFTER EXPOSURES TO RELATIVELY HIGH CONCENTRATIONS FOR SHORT PERIODS

In Part I are described the changes found in guinea pigs exposed to the following relatively high concentrations of ethyl bromide vapor for the short periods of time noted:

Number of pigs in group	Concentration of vapors, per cent by volume	Time of exposure, minutes
3	[1] 18	[2] 19
3	14	10
3	13	5
3	6	10

[1] The oxygen content of the air was reinforced with pure oxygen to keep the amount within 18 and 25 per cent, so that no ill effects could be ascribed to oxygen deprivation.
[2] Exposed until death occurred.

LUNGS

(*a*) *Bronchioles.*—The mucous membrane of the bronchioles appeared thickened, producing a narrowing and irregularity of outline of the lumen. The individual cells were swollen, their membranes were distended, and the cytoplasm was vacuolated. The lumina of the bronchioles contained an exudate of desquamated epithelial cells, leucocytes, and numerous red-blood cells.

(*b*) *Blood vessels.*—The blood vessels were prominent, dilated, and filled with blood.

(*c*) *Alveoli.*—The alveolar walls were swollen. The capillaries in in the alveolar walls were dilated and filled with blood and projected in distinct loops into the air spaces. The alveolar spaces contained varying amounts of a sero-fibrinous exudate in which numerous fine granules and endothelial leucocytes were found.

In some fields the alveolar spaces were entirely filled with an exudate made up chiefly of endothelial leucocytes, as shown in Figure 1. The specimen shown was taken from an animal exposed to 18 per cent ethyl bromide for 19 minutes, and which died at the end of exposure. The same change occurred in all animals that died either during exposure or one to eight days after exposure. However, animals that did not die but were killed in four to eight days after exposure indicated a resolution of the exudate.

Figure 2 is a similar section taken from an unexposed control animal and is shown for comparison with Figure 1.

HEART

The heart muscle showed no degenerative changes.

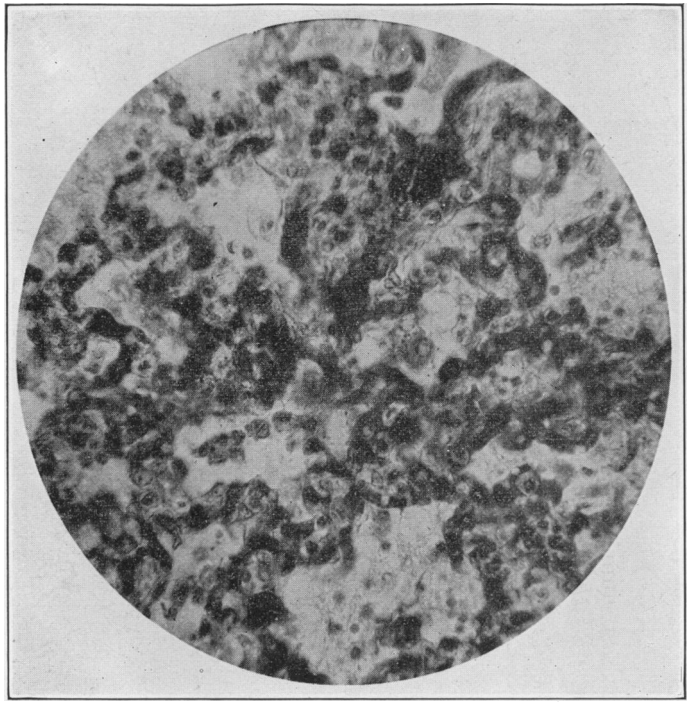

Fig. 1.—Section of lung taken from a guinea pig that died immediately after a 10-minute exposure to 18 per cent ethyl bromide vapors. (× 560)

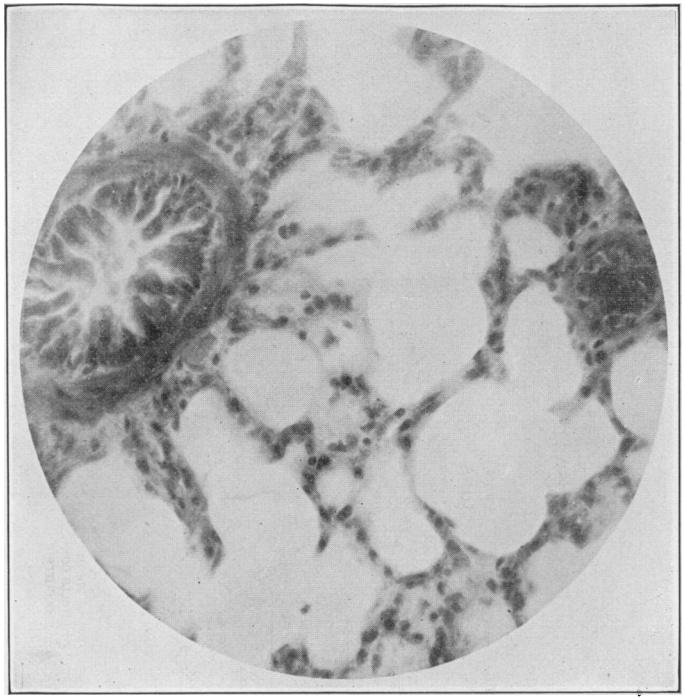

Fig. 2.—Section of lung from control guinea pig. (× 560)

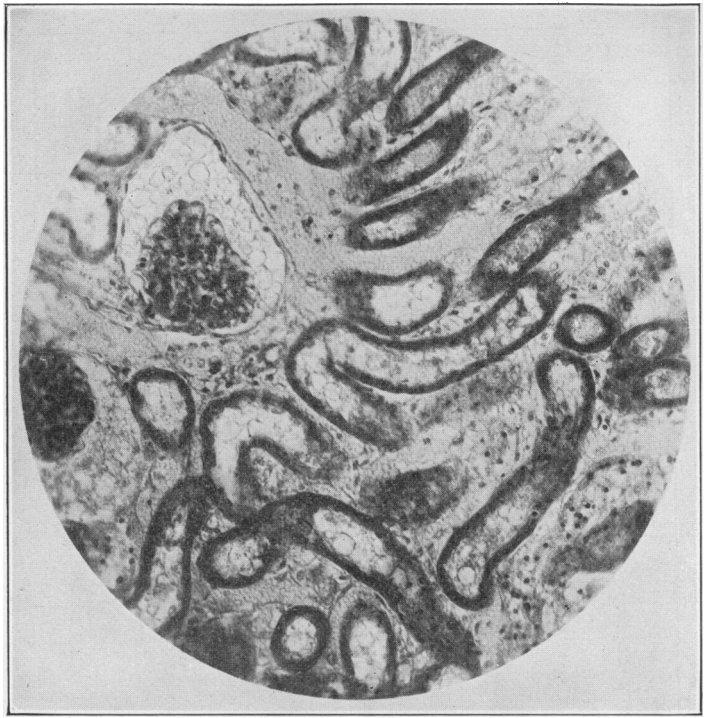

Fig. 3.—Section of kidney taken from guinea pig exposed to 1.1 per cent ethyl bromide vapors for 270 minutes (X 225). This animal died within 24 hours after the test

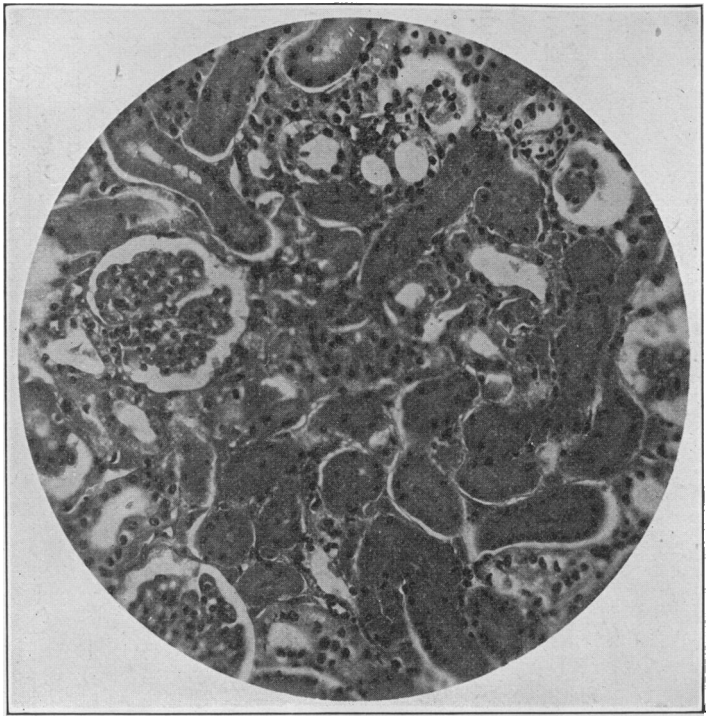

Fig. 4.—Section of kidney from control guinea pig. (X 225)

LIVER

In animals that died during exposure, or died or were killed in less than four days after exposure, the efferent veins of the lobules were dilated and filled with blood. The sinusoids about the efferent veins were widened and congested, making the center of the lobule appear conspicuous. The cells about the center of the lobule were compressed and elongated from the distension of the sinusoids; the remainder of the parenchymal cells appeared normal. This central congestion of the lobule was not noted in the animals that died or were killed later than four days after exposure.

PANCREAS

The parenchymal cells of the pancreas and islands of Langerhans appeared unchanged. The lining epithelium of the ducts was swollen and hydropic. There were small amounts of a sero-granular exudate in the lumen of the ducts.

SPLEEN

The Malpighian corpuscles were unchanged. The terminal veins and pulp veins were prominent and congested with blood. The pulp sinusoids were dilated and filled with blood, causing some compression of the pulp cells. There were also small areas of acute congestion throughout the pulp tissue; this congestion was noted only in those animals that died on test or were killed immediately after test.

KIDNEYS

The kidney structure appeared similar to that of the controls. There were no definite degenerative changes in the capillary tufts or tubules. There was, however, evidence of a congestion manifested by the presence of numerous red-blood cells in the capillaries of the tufts and the marked prominence of the intertubular capillaries. This was noted only on those specimens of animals that died on test or were killed immediately after exposure.

SUPRARENALS

There was no evidence of any damage occurring in the parenchymal cells of the suprarenals. The blood vessels were prominent in the sections.

PART II. PATHOLOGY FOUND AFTER EXPOSURE TO LOW CONCENTRATIONS FOR RELATIVELY LONG PERIODS

Part II presents a description of the changes found in the tissues after the pigs had been exposed to the following relatively low concentrations of ethyl bromide vapor for the periods of time indicated:

Number of pigs in group	Concentration of vapors, per cent by volume	Time of exposure, minutes	Number of pigs in group	Concentration of vapors, per cent by volume	Time of exposure, minutes
6	2.4	90	6	0.65	270
6	1.2	55	6	0.65	540
6	1.2	90	6	0.65	810
6	1.2	270	6	0.32	540
6	0.65	180	6	0.32	810

LUNGS

The sections showed no pathology except for exposures of 270 minutes to 1.2 per cent vapors, 540 and 810 minutes to 0.65 per cent, and 540 and 810 minutes to 0.32 per cent, when the specimens began to show evidence of a reaction by the lungs resembling that found in the animals exposed to high concentrations, as described in Part I. The reaction was of a lesser degree, but it was present and gave positive evidence that relatively long exposures to low concentrations had an irritating effect on the lungs, leading to congestion and serous exudation.

HEART

The heart muscle was apparently normal; no definite retrograde changes were evident.

LIVER

A large portion of the specimens examined showed an apparently beginning central necrosis of the liver lobules. The cells about the central vein were hydropic, being increased in size and vacuolated. In some cells the granules had entirely disappeared, leaving the cytoplasm clear, the latter staining homogeneously with the counter stain. In other groups of cells there was an evident increase in the size and number of the albuminous granules; the nuclei, however, were apparently unchanged. The portal vessels were apparently untouched, as were the cells about the periphery of the lobules. This condition was found in those animals that died on test or within one to four days after exposure; it was also found in those animals killed immediately after exposure or within four days.

SPLEEN

The splenic nodules and pulp were unchanged.

KIDNEY

The most prominent changes in the kidney occurred in the glomeruli. The capsular spaces were dilated and filled with an exudate made up of a granular material and a circular reticulum, the latter probably being albuminous envelopes of drops of fluid brought out by the fixative. This is clearly shown in Figure 3. A few red cells were also present in the exudate. The capillary tufts were compressed, and in some instances only a small portion remained. The tubules throughout showed marked evidence of damage. The lumina of the convoluted tubules were greatly enlarged and were filled with an exudate of the same structure found in the capsular spaces. The lining epithelial cells of the tubules were compressed and flattened. These changes were present to a greater extent in the collecting tubules. Congestion was marked throughout. The intertubular capillaries were dilated and filled with blood, widely separating the

tubules from each other. The large vessels were very prominent and there were areas of laked red-blood cells throughout the interstitial tissue. There was no evidence of a proliferation or desquamation of the capsular epithelium.

Such was the picture presented by those animals that died on test or as a result of the exposure in one to eight days. In those animals which survived and were killed, the picture was modified, although some evidence of damage was present in each case.

SUPRARENALS AND PANCREAS

No pathological changes were found in the suprarenals and pancreas.

SUMMARY

From the foregoing description of the pathological changes found in these experiments, it is evident that high concentrations of ethyl bromide vapors in air (18, 14, 13, and 6 per cent) are markedly irritating to the lungs when breathed for a short period, producing an acute congestion and edema. The extent of reaction present in the lungs varies directly with the concentration; the changes found in the lungs after exposure to 18 per cent concentration of ethyl bromide vapors are greater than those found at 14, 13.2, or 6 per cent. This congestion and edema comprised the most prominent feature exhibited by the animals that died on test or in 24 hours as a result of the exposure. The animals that survived were apparently able to take care of the damage. Specimens from the surviving animals showed a resolution of the exudate and disappearance of the congestion of the capillaries and larger blood vessels.

Low concentrations of ethyl bromide vapor in air (2.4, 1.2, 0.65, and 0.32 per cent) act as a toxin to the kidney, producing a diffuse acute parenchymatous nephritis. The effect on the kidney varied directly with the period of exposure in each case—that is, for the same concentration, the damage to the kidney was greater after 810 minutes exposure than after 540, 270, or 90 minutes. The damage to the kidney was the most prominent change which occurred in those animals that died on test or as a result of the test up to eight days. The animals that survived the exposures were apparently able to take care of the damage, which was present in only a slight degree in those cases.

Exposure to low concentrations for sufficiently long periods of time was irritating to the lungs, producing to some degree the same picture as that described for exposure to high concentration of vapors.

ACKNOWLEDGMENTS

The writers desire to acknowledge the assistance given by Surg. R. R. Sayers, United States Public Health Service, Chief Surgeon

United States Bureau of Mines, under whose direction this work was conducted, and that of Dr. Samuel R. Haythorn, director of the William G. Singer Research Laboratory and consulting pathologist United States Bureau of Mines, for confirming some of the results and for reviewing this report.

DEATH RATES IN A GROUP OF INSURED PERSONS

RATES FOR PRINCIPAL CAUSES OF DEATH, JUNE, 1928, AND COMPARISON BY WHITE AND COLORED FOR THE FIRST SIX MONTHS OF 1928, 1927, AND 1926

The accompanying tables are taken from the Statistical Bulletin for July, 1928, published by the Metropolitan Life Insurance Co. They present the mortality of the industrial department of the company for June, 1928, as compared with May, 1928, and June, 1927, and compare the rates for white and colored policyholders for the first six months of the years 1928, 1927, and 1926. The rates for recent years are based on a strength of more than 18,000,000 insured persons of the industrial populations of the United States and Canada.

The death rates for this selected group of persons have been uniformly lower than the rates for the general population. In recent years the total death rates have been about 72 per cent of the rates for the registration area.

JUNE, 1928

The mortality record for June for this insured group showed an improvement over the unfavorable record for May. While the death rate for May, 1928, was 20 per cent higher than that for May, 1927, the rate for June was only slightly above that for June a year ago. The decrease in mortality in June from that in May was due largely to the decrease in deaths from influenza, pneumonia, cerebral hemorrhage, and organic heart disease; but, in spite of these declines, the June rates for influenza, pneumonia, and heart diseases were markedly higher this year than a year ago. The tuberculosis death rate for June was slightly higher this year than last; but the record for the first six months of 1928 shows a decrease from the rate for the corresponding period of 1927.

The death rate for measles continued high in June; and the rates for whooping cough and diphtheria were slightly higher than those of a year ago.

June was the fifth month of the first six months of 1928 to record higher death rates for diabetes than obtained last year.

Notably lower rates for June this year as compared with last were recorded for typhoid fever, Bright's disease, puerperal conditions, homicides, and automobile fatalities.

Death rates (annual basis) per 100,000 for principal causes of death

[Industrial insurance department, Metropolitan Life Insurance Co.]

Cause of death	Rate per 100,000 lives exposed [1]			
	June, 1928	May, 1928	June, 1927	Year 1927 [2]
Total, all causes	943.6	1,038.1	923.2	885.4
Typhoid fever	2.5	2.0	6.1	4.6
Measles	10.2	12.1	5.7	4.1
Scarlet fever	3.1	3.1	3.5	3.1
Whooping cough	7.4	6.9	6.9	6.4
Diphtheria	10.8	9.1	10.4	10.5
Influenza	23.8	38.6	12.0	17.7
Tuberculosis (all forms)	102.6	105.0	99.8	93.3
Tuberculosis of respiratory system	87.8	92.5	80.9	81.7
Cancer	73.9	76.6	74.0	74.0
Diabetes mellitus	17.8	19.8	16.9	16.7
Cerebral hemorrhage	55.2	62.2	57.5	54.9
Organic diseases of heart	142.7	159.3	138.7	132.2
Pneumonia (all forms)	94.1	132.5	69.7	77.6
Other respiratory diseases	16.2	20.8	16.7	15.4
Diarrhea and enteritis	21.3	15.4	22.0	24.5
Bright's disease (chronic nephritis)	67.6	75.8	75.5	69.3
Puerperal state	14.4	14.5	16.3	15.4
Suicides	9.4	9.1	8.6	8.3
Homicides	5.8	7.6	7.6	7.2
Other external causes (excluding suicides and homocides)	61.1	56.9	69.0	63.7
Traumatism by automobiles	16.9	15.8	19.5	18.3
All other causes	203.8	210.8	206.3	186.7

[1] All figures include infants insured under 1 year of age.
[2] Based on provisional estimates of lives exposed to risk in 1927.

FIRST SIX MONTHS OF 1928

Health conditions in this group of 18,000,000 insured persons during the first six months of 1928 were not quite as good as during the corresponding periods of 1927 and 1921, for which years were recorded the lowest and next lowest mortality rates, namely 8.6 and 8.7 per 1,000, in the history of the company. The death rate for the first quarter reached the minimum recorded for the first quarter in 1927, but later increased mortality, beginning the latter part of March and continuing through April and May, brought up the rate for the first half year.

Influenza and pneumonia mortality was unusually high during the second quarter; and rates for the principal degenerative diseases also increased during that period.

The cancer death rate among both white and colored policyholders was higher than in either 1927 or 1926.

The diabetes death rate in this group has been increasing since 1924. The increase has been more pronounced for the colored than for white persons.

The tuberculosis record is extremely favorable. The death rate for the first half year is always the highest, and the rate for this period in 1928 was 96.9 per 100,000, as compared with the former minimum rate of 100.3 recorded for the corresponding period last

year. Among white policyholders the rate was 75.5, as compared with the previous low of 80.4 recorded last year. This improvement in recent years has not extended to the colored population of this group.

Measles shows an increase over last year, scarlet fever and diphtheria show little change, while whooping cough mortality recorded a decrease. Typhoid fever mortality was also lower for the first six months this year than in 1927.

The half-year record for puerperal conditions is the best in the experience of the company.

The death rates for alcoholism and cirrhosis of the liver were lower than for the corresponding period of 1927.

The death rate for automobile accidents was about the same as that for 1927.

Death rates per 100,000 for principal causes of death, first six months of 1928, 1927, and 1926, for white and colored policyholders

[Industrial insurance department, Metropolitan Life Insurance Co.]

Cause of death	Death rates per 100,000 persons exposed					
	White			Colored		
	January-June, 1928	January-June, 1927	January-June, 1926	January-June, 1928	January-June, 1927	January-June, 1926
All causes of death	888.3	856.8	966.7	1,619.4	1,540.4	1,654.6
Typhoid fever	1.7	4.2	2.5	2.7	6.5	4.5
Measles	8.6	7.1	18.0	8.1	3.6	13.0
Scarlet fever	4.0	4.4	5.0	1.7	1.4	1.5
Whooping cough	5.8	6.9	11.1	8.8	9.4	13.6
Diphtheria	12.1	11.8	10.1	6.2	6.7	6.2
Influenza	28.2	21.6	45.9	62.1	52.4	91.5
Meningococcus meningitis	2.1	1.3	.9	2.9	1.8	.6
Tuberculosis (all forms)	75.5	80.4	88.1	242.5	237.6	240.8
Tuberculosis of respiratory system	66.1	70.3	77.5	212.3	208.3	210.8
Tuberculosis of meninges, etc	4.4	5.0	5.1	8.2	7.4	7.7
Other forms of tuberculosis	5.0	5.1	5.5	22.0	21.8	22.3
Cancer	75.2	74.5	74.3	77.3	71.8	67.0
Diabetes	18.7	17.3	18.2	21.4	19.4	16.3
Alcoholism	2.8	3.1	3.4	5.3	5.0	4.8
Cerebral hemorrhage; apoplexy	53.8	51.5	55.3	104.4	97.7	101.1
Organic diseases of the heart	139.5	130.0	142.3	239.7	217.4	219.5
Total respiratory diseases	119.8	102.7	140.6	243.8	209.8	276.3
Bronchitis	4.8	4.6	5.9	7.2	8.1	10.7
Broncho-pneumonia	44.7	39.2	58.2	81.9	68.0	97.0
Pneumonia (lobar and undefined)	61.5	50.9	68.2	141.1	121.9	155.6
Other diseases of respiratory system	8.8	8.0	8.3	13.5	11.7	13.0
Diarrhea and enteritis	15.7	16.5	18.0	17.5	19.6	20.1
Under 2 years	12.8	13.3	15.2	12.1	13.3	14.9
2 years and over	2.9	3.2	2.8	5.4	6.3	5.2
Acute nephritis	4.2	4.0	4.6	13.0	15.3	16.9
Chronic nephritis	67.2	66.0	72.2	136.2	129.6	137.0
Total puerperal state	13.5	14.5	15.8	21.1	25.5	24.5
Puerperal septicemia	4.7	5.9	6.0	9.2	13.4	11.4
Puerperal albuminuria and convulsions	3.0	2.8	3.5	3.7	4.6	5.9
Other diseases of puerperal state	5.8	5.9	6.3	8.2	7.5	7.2
Total external causes	66.3	68.2	68.5	105.0	115.5	110.4
Suicides	8.7	8.5	7.8	6.2	7.0	5.7
Homicides	2.8	3.1	3.1	30.6	36.6	33.1
Accidental and unspecified violence	54.9	56.6	55.6	68.2	71.9	71.6
Accidental drowning	4.9	4.5	4.1	4.1	6.5	3.4
Automobile accidents	15.1	15.1	14.5	16.6	14.7	13.1
All other and ill-defined causes of death	173.7	170.7	173.8	299.8	294.7	288.9

COURT DECISION RELATING TO PUBLIC HEALTH

City held liable in damages for sewage pollution of stream.—(Indiana Appellate Court; City of Frankfort *v.* Slipher, 162 N. E. 241; decided June 19, 1928.) The appellee owned a farm through which a natural watercourse flowed. In an action by him for damages against the city of Frankfort, it was alleged that the city had polluted the watercourse by unlawful deposit of sewage therein. The trial court found the following facts specially: That the city emptied its sewage into the watercourse; that such sewage was dangerous to public health, and had made the occupying of the dwelling houses on the appellee's land uncomfortable and unsatisfactory, and interfered with the use of his land; that the city could, at a reasonable cost, have erected a sewage-reduction plant, so that all of the sewage could have been rendered pure and harmless; that the city negligently failed to take any steps to erect a sewage-reduction plant or to reduce the unwholesome and dangerous condition of the sewage; and that the city negligently deposited the sewage in the watercourse to the injury of the appellee. The court concluded as a matter of law that the appellee should recover damages and entered judgment in accordance therewith. The appellate court affirmed such judgment, saying:

> Under the facts as found by the court, public necessity did not call for or require the pollution of the water of either Prairie Creek or South Fork, and, since appellant, by the expenditure of a reasonable sum of money, could have adopted a method of purifying the sewage, the judgment should be affirmed.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Effect of Liquid Chlorine Application to Trickling Filters. T. C. Schaetzle. *Bulletin of the Maryland State Department of Health,* vol. 1, No. 3, April, 1928, pp. 87–96. (Abstract by O. R. Cox.)

The settled sewage flowing to a trickling filter located in the suburbs of Baltimore was chlorinated to determine the effect upon the *Psychoda,* the trickling filter fly which was present in large numbers in the filtering material, and to ascertain the resulting effect upon the nitrifying powers of the trickling filter of such chlorination. Chlorine doses of from 5.0 p. p. m. and 10.0 p. p. m. were used. It was found that such chlorination did not destroy the larvae of *Psychoda,* although the adult fly was killed by direct contact with the chlorinated sewage. The chlorination of the sewage resulted in the removal of the growth on the stones in the immediate vicinity of the nozzles. Very little reduction in the nitrifying power of the bed was observed

during 5.0 p. p. m. dosing and a greater but not abnormal denitrification resulted during the application of 10.0 p. p. m. chlorine. The nitrifying powers of the trickling filters began to return to an approximately normal condition within about four hours after the chlorine application was stopped. The filter effluent contained residuals of between 0.2 p. p. m. and 1.33 p. p. m. chlorine, during one complete cycle of the dosing syphon.

Purification of Waste Water from Lignite-Distillation Plants. Dietrich Witt and Fritz Schuster. Gas u. Wasserfach 71, 241–4 (1928). Abstract by R. W. Ryan in *Chemical Abstracts*, vol. 22, No. 11, June 10, 1928, pp. 2018–2019.

"Attempts were made to purify a tarry turbid effluent from a lignite-distillation plant, which contained 0.06 per cent C_6H_5OH, 49 g. of H_2S, per cu. m., and required 3,600 mg. $KMnO_4$ per liter, by aerating, adding $Ca(OH)_2$, and filtering, adding ground clinker, lignite and alum, and peat and alum, with or without electrolysis in each case. The two latter methods, without electrolysis, gave clear, nearly odorless effluents after five and three days, respectively. The method of purification finally adopted was to pass the water over low-temperature (Schwelkok) coke to remove H_2S, then acidify slightly with flue gases, and pass the water over a fresh filter composed of washed coke. The latter filter is used as the prefilter as soon as it becomes ineffective. For this water, 4.6 per cent coke was used, and a rate of 1 g. water per g. of coke per hour was maintained on the second filter. The effluent had only a very slight odor, gave only a slight turbidity with Br water, required only 475 mg. $KMnO_4$ per liter, and remained colorless even after standing in air."

The Treatment of Beet Sugar Factory Effluents. O. Spengler. *Surveyor*, vol. 73, No. 1886, March 16, 1928, pp. 323–325. (Abstract by H. W. Streeter.)

The most objectionable effluents from beet sugar factories are those which contain large amounts of dissolved organic matter, notably the diffusion and pulp press waste waters, which also contain 0.15 to 0.3 per cent of sugar. The most successful method developed in Germany for treatment of these wastes involves successive fermentations of them in settling ponds, lime being added after each fermentation to neutralize the acid formed. The ponds are made narrow and deep in order to maintain high temperatures, which are favorable to the fermentation. The formation of a thick foam also aids in the process. The sludge is pumped to special fields, where it provides a fertile soil for plants. The liquid effluent may be discharged directly into a large stream, but frequently is passed to irrigation fields. In one instance cited, the reduction in nitrogen is stated to have been from 102 to 14 p. p. m.

The Removal of Phenol Wastes from Gas Plants. Louis Shnidman and Linn B. Bowman. *Gas Age-Record*, vol. 61, No. 18, May 5, 1928, pp. 626–628 and 634. (Abstract by J. I. Connoly.)

The Rochester Gas and Electric Corporation, cooperating with the city of Rochester, N. Y., and the State department of health, experimented with the addition of phenol-bearing wastes from ammonia stills to city sewage. One part of waste was diluted with 1,000 parts of sewage. The mixture was circulated for three hours in a closed system, to simulate the flow through a sewer. A reduction from 5.3 p. p. m. to 5.0 p. p. m. of phenol occurred, indicating that the destruction or absorption of phenol by the raw sewage was slight. The alkalinity, hydrogen ion concentration, and bacterial flora were virtually unchanged.

A mixture of the same proportions was treated in the one-half million gallon Imhoff tank disposal plant at Charlotte for 10 weeks. A well-digested sludge, easily dewatered, was obtained. The pH was constant, free ammonia increased, number of bacteria increased, and grease and sulphur trioxide decreased in the sludge. It is concluded that "the addition of the ammonia still waste to sanitary sewage at the rate of 1–1000, thereby adding about 2.2 p. p. m. of phenol, can be carried on successfully with no deleterious effect upon the sludge digestion and plant operation of Imhoff tanks." The absorption of phenol in the Imhoff tank is negligible.

The amount of phenol removed by trickling filters and by both Imhoff tanks and trickling filters was found to vary with the concentration of phenol. The following table summarizes the data presented:

	Trickling filters (sanitary sewage normally having 3.0 p. p. m. phenol)				Imhoff tanks and trickling filters (sanitary sewage normally having 3.6 p. p. m. phenol)			
Ratio of waste to sewage	None.	1–210	1–420	1–880	None.	1–210	1–420	1–850
Per cent phenol reduction	26.7	24.3	38.3	28.9	42.9	35.1	42.7	31.1

Conclusions.—In large Imhoff tank plant operations, ammonia still wastes may be added to sewage at a ratio of 1–2000 with no ill effects upon operation; but only a relatively small amount of phenol, if any, is destroyed. Those treatments employing oxidation, such as trickling filters, produce a varying amount of phenol destruction.

Contribution to the Economic Operation of Sewage Treatment Plants of the Two-Storied Type. Anon. Preuss. Gesundh Ing. 51, 186–187 (1928). Abstract by Wayne L. Denman in *Chemical Abstracts*, vol. 22, No. 11, June 10, 1928, p. 2019.

"Treatment plants of the two-storied type are divided into two classes: (1) Those in which the settling compartment lies on the free-

water surface and (2) those in which it lies below the water surface. Plants of the second class are considered to be the best. In the first class the cross section of the settling space varies with the quantity of sewage treated, while in the second class the area is constant for all quantities of sewage. The coefficient of friction increases faster with increasing area in those of the second class. An example of the first class is the 'Emscher' basin, while a typical representative of the second class is the 'OMS' basin."

The Effect of High Salt Concentration on the Biochemical Processes in Sludge from the Liman Estuary. A. S. Saslawsky. Centr. Bakt. Parasitenk. II Abt. 73, 18–28 (1928). Abstract by John T. Myers in *Chemical Abstracts*, vol. 22, No. 10, May 20, 1928, p. 1819.

"The sludge of the Kujalnitzky-Liman has a density of 25.5 Be. and contains many bacteria which can live and reproduce in a saturated NaCl solution. In the Liman brine, organic substances may be attacked with the formation of H_2S, NH_3, trimethylamine and indole. A bacillus was isolated in pure culture which could form H_2S and NH_3 from bouillon containing 25 per cent NaCl. Two species of bacilli and one coccus were found which could do the same in the presence of 30 per cent NaCl and one in the presence of 35 per cent NaCl."

Sewage Disposal Plant Construction at Fond du Lac, Wisconsin. L. R. Howson. *Water Works*, vol. 67, No. 6, June, 1928, pp. 232–233. (Abstract by C. G. Gillespie.)

This is the third phase of sewage treatment here. In 1903 septic tanks were built; in 1912 an Imhoff tank was built; and now separate sludge digestion with provision for sprinkling filters and an outfall into Lake Winnebago are provided. Present population is 30,000; sanitary sewage flow 1.75 m. g. d. Reuping tannery, on a separate sewer, produces 1 to 4 m. g. d. Fond du Lac River, for the last couple of miles through the city, is septic and odorous; river above is saturated with oxygen; oxygen reappears at Lake Winnebago 2 miles below Reuping tannery. The lake is shallow and warm in summer, abounding with algæ. In the warm months, oxygen from plankton satisfies the oxygen demand within 1,000 feet of the river mouth; but after killing frosts, oxygen demand was not satisfied 3,000 feet out.

The plant embraces coarse screens and pumping station; Dorr settling tanks, and Dorr sludge digestion tanks; sludge drying beds; sprinkling filters; outfall to Lake Winnebago. Plant site is in a swampy area on lake shore. Tanks are built above ground. City has imposed requirements on tannery, allowing it to use the old Imhoff tanks for tannery waste treatment, but the tannery must keep the solids that are turned to the city sewer below 300 p. p. m.

The industry operates the tanks. It is not established that the Imhoff tanks will handle the heavy tannery sludge; the tannery will be required to build other tanks if necessary. Settling tanks give four hours' detention, average flow, and two and one-half hours for daylight hours' flow as estimated for 1940. Clarifier tanks are housed. Two digester tanks provide 2½ cu. ft. per person served in 1940. The large capacity is due to allowance for residual industrial waste. Digesters are provided with gas collection and burning in a Bryant type hot-water boiler. Hot water is recirculated through a series of four 1¼-in. pipes encircling each digester tank. Sludge can be drained from either clarifier to either digester. Supernatant liquor is removed over trapped weirs. Sludge drying beds provide 1 sq. ft. per capita in 1940. Sludge removal head is 13 feet. Outfall sewer extends 1,600 feet into the lake. Cost of project, exclusive of filters, is $175,000. Date of operation, about June 1, 1928.

Some Old and New Factors in Water Softening. Daniel H. Rupp. Proceedings Tenth Texas Water Works Short School, January, 1928, pp. 115–117. (Abstract by H. N. Old.)

The author discusses briefly numerous features and methods employed in water softening, such as lime and soda ash, split treatment of oversoftening the larger portion of flow with subsequent mixing with untreated portion, use of sludge return, and use of the more modern mechanical mixing chambers and clarifiers.

There is taken up the practice of using larger alum dosage to obtain reduction of residual hardness much below the theoretical quantities which the coagulant should remove; also pebble lime as an aid to filtration and softening due to its lower cost per unit of CaO and ease of handling. Recarbonization of settled softened water for the purpose of eliminating incrustation of filters and distribution systems and the strides made by the zeolite process of softening for large municipal plants are referred to in the article.

In some detail is described the treatment used at the Piqua, Ohio, softening plant, known as "The use of CO_2 as a softening reagent together with the excess lime treatment." It is stated that this treatment results in the lowest residual alkalinity ever obtained in the lime and soda process, being about two grains or less, the lowest theoretical limit.

A distinct advantage of the excess lime treatment, in the opinion of the author, is the effectual disinfection of all bacteria by the causticity in what is usually the first step of the purification process, the coagulation basins, leaving the filtration and chlorination processes a double factor of safety.

Interference of Clostridium welchii with B. coli Tests in Water Analysis. John F. Norton and Marion Barnes. *Journal American Water Works Association*, vol. 18, No. 6, June, 1928, pp. 729–730. (Abstract by H. D. Cashmore.)

An account of experimental work done by the authors to determine the effect of *Clostridium welchii* on *B. coli* tests in water analysis.

When spores of *Clostridium welchii* are present with *B. coli* in lactose broth, a rapid production of acid and gas takes place, which when a pH value of 4.2 or 4.3 is reached in 24 hours, makes the recovery of *B. coli* uncertain. At this acidity the *B. coli* organism was found never to be viable at the end of 48 hours, thus giving negative *coli* results when the organism was present in the sample.

Iron Removal Plant for Amesbury, Mass. George A. Sampson. *Journal New England Water Works Association*, vol. 42, No. 1, March, 1928, pp. 53–64. (Abstract by L. W. VanKleeck.)

Amesbury, Mass., is mainly a manufacturing community located in the extreme northeast corner of Massachusetts. The population in 1925 was 11,229, and the water consumption 63.2 gallons per capita per day. The town is supplied with water from 90 wells located in the valley of the Powow River, two miles west of the business district. Forty of these wells were added by Weston & Sampson at the time of installing the iron removal plant.

In 1925 the iron content of the Amesbury water was 7 p. p. m., or 58 pounds of iron per 1,000,000 gallons of water. The iron removal plant as designed by Weston & Sampson consists first of two aerator units, each 20 feet by 36 feet in area. Each aerator has 45 2-inch risers with nozzles which discharge on a trickler bed of coke 6 feet deep. Two subsiding basins, 20 feet by 36 feet in area, and having a capacity of 56,500 gallons each, deliver the water to the slow sand filters. These filters have a net filtering area slightly in excess of 0.2 acre, and the present normal rate of filtration is 7,500,000 gallons per acre per day. The effluent from the filters passes through a filter control house, and hence to the filtered water basin of capacity 250,000 gallons. The water is then pumped to high and low service reservoirs.

The results of operation have been remarkably successful, the removal of iron being from 7.5 p. p. m. for a maximum iron content of the raw water to 0.10 p. p. m. for a maximum iron content of the filtered water, or about 98.2 per cent reduction. The article describes the system in detail, together with the additions to the well field and pumping equipment, which were made at the time of building the iron removal plant. The value of the article is greatly increased by a complete set of plans of the plant. The total expenditure by the town was approximately $142,500.

A typical iron removal plant, well designed, is described by Mr. Sampson in clear, understandable English.

Adaptability of Sodium Aluminate in Water Treatment. P. W. Evans. Proceedings Tenth Texas Water Works Short School, January, 1928, pp. 134–142. (Abstract by H. N. Old.)

Included in this article are numerous quotations from various water-treatment plant officials as to the advantages of using small amounts of sodium aluminate in connection with lime or lime and soda ash treatment as a means of expediting and carrying to completion coagulation reactions, as well as to replace in many cases a portion of the alum used as a coagulant in water clarification.

Four main advantages are given, as follows: (1) Increased plant capacity or output due to more rapid clarification or settling; (2) less total hardness without the necessity of carrying excess alkalinity and causticity, which should, in turn, result in reduced trouble from foaming; (3) the avoidance of the increase of alkali sulphates in treated water, resulting from the use of either alum or copperas; (4) the elimination or material reduction in the amount of after-precipitation which will result in—(*a*) reduced trouble of pipe lines, heaters, branch pipes, and injectors becoming clogged; (*b*) a material reduction in foaming troubles; (*c*) a decided reduction in the number of boiler washings.

Two pages of the article are devoted to explanation of the chemistry involved in the reactions taking place. The most complete reference to the advantageous use of sodium aluminate is quoted from the experience of the Washington Suburban Sanitary District, as contained in the January issue of *Industrial and Engineering Chemistry*.

DEATHS DURING WEEK ENDED AUGUST 18, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended August 18, 1928, and corresponding week of 1927. (From the Weekly Health Index, August 22, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Aug. 18, 1928	Corresponding week, 1927
Policies in force	71,589,449	68,209,364
Number of death claims	11,713	11,025
Death claims per 1,000 policies in force, annual rate	8.6	8.4

Deaths from all causes in certain large cities of the United States during the week ended August 18, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, August 22, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Aug. 18, 1928		Annual death rate per 1,000 corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended Aug. 18, 1928 [2]
	Total deaths	Death rate [1]		Week ended Aug. 18, 1928	Corresponding week, 1927	
Total (69 cities)	6,325	10.8	10.0	736	655	59
Akron	38			7	4	76
Albany [3]	27	11.7	8.7	3	1	61
Atlanta	58	11.9	13.0	6	12	
White	29		11.9	1	9	
Colored	29	(4)	15.5	5	3	
Baltimore [3]	184	11.6	12.1	35	31	111
White	132		10.8	21	23	84
Colored	52	(4)	19.5	14	8	219
Birmingham	78	18.3	16.5	6	11	51
White	30		14.1	2	5	28
Colored	48	(4)	20.3	4	6	90
Boston	171	11.2	12.6	12	32	33
Bridgeport	24			2	2	37
Buffalo	109	10.3	11.0	11	16	47
Cambridge	16	6.7	9.3	3	3	53
Camden	24	9.3	7.8	3	2	48
Canton	21	9.4	9.2	8	2	190
Chicago [3]	670	11.1	9.2	74	49	63
Cincinnati	126	15.9	13.5	22	11	133
Cleveland	180	9.3	7.9	25	13	68
Columbus	61	10.7	12.0	8	8	75
Dallas	52	12.5	12.1	5	3	
White	41		11.9	5	3	
Colored	11	(4)	13.3	0	0	
Dayton	36	10.2	7.5	3	2	50
Denver	66	11.7	11.2	5	7	
Des Moines	35	12.0	6.3	2	3	33
Detroit	222	8.4	9.0	37	31	57
Duluth	30	13.4	7.3	3	1	70
El Paso	31	13.8	14.2	10	7	
Erie	26			3	1	62
Fall River [3]	23	9.0	6.3	5	7	86
Flint	29	10.2	9.5	5	5	64
Fort Worth	40	12.4	9.6	4	3	
White	33		7.2	4	3	
Colored	7	(4)	26.6	0	0	
Grand Rapids	28	8.9	8.1	2	2	30
Houston	68			4	7	
Indianapolis	76	10.4	12.1	6	12	46
White	62		12.3	4	9	35
Colored	14	(4)	10.5	2	3	121
Jersey City	68	10.9	8.1	12	7	90
Kansas City, Kans	32	14.1	11.1	4	3	84
White	27		9.7	3	1	74
Colored	5	(4)	17.2	1	2	145
Kansas City, Mo	81	10.8	9.5	8	6	57
Knoxville	23	11.4	13.3	3	2	65
White	18		13.9	3	2	73
Colored	5	(4)	8.5	0	0	0
Los Angeles	209			17	19	49
Louisville	84	13.3	10.6	17	15	142
Lowell	17	8.1	9.0	1	3	21
Lynn	17	8.4	10.0	5	3	126
Memphis	68	18.7	21.6	5	8	59
White	38		16.7	1	5	19
Colored	30	(4)	30.4	4	3	125
Milwaukee	88	8.5	8.5	12	11	54
Minneapolis	80	9.2	7.6	7	8	42
Nashville	52	19.6	14.0	10	3	157
White	35		9.5	9	2	192
Colored	17	(4)	25.5	1	1	60

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Deaths for week ended Friday, Aug. 17, 1928.
[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended August 18, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, August 22, 1928, issued by the Bureau of the Census, Department of Commerce)—Contd.

City	Week ended Aug. 22, 1928		Annual death rate per 1,000 corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended Aug. 18, 1928
	Total deaths	Death rate		Week ended Aug. 18, 1928	Corresponding week, 1927	
New Bedford	24	10.5	9.6	3	3	65
New Haven	42	11.7	13.5	4	1	56
New Orleans	132	16.1	18.6	15	16	73
White	80		13.8	10	6	73
Colored	52	(4)	32.1	5	10	73
New York	1,212	10.5	9.3	136	121	55
Bronx Borough	161	8.8	7.0	13	10	39
Brooklyn Borough	362	8.2	8.7	39	54	39
Manhattan Borough	514	15.3	12.2	68	43	81
Queens Borough	135	8.3	7.0	11	10	44
Richmond Borough	40	13.9	12.1	5	4	90
Newark, N. J	88	9.7	7.2	10	10	51
Oakland	46	8.8	9.8	5	1	54
Oklahoma City	26			2	5	
Omaha	43	10.1	9.5	5	3	58
Paterson	30	10.8	10.9	6	2	104
Philadelphia	411	10.4	9.1	39	29	53
Pittsburgh	131	10.2	11.1	29	23	65
Portland, Oreg	65			3	8	32
Providence	48	8.8	9.7	5	7	44
Richmond	60	16.1	12.5	10	10	131
White	28		9.2	5	4	101
Colored	32	(4)	20.6	5	6	184
Rochester	56	8.9	10.6	10	10	81
St. Louis	190	11.7	9.3	14	6	47
St. Paul	44	9.1	11.5	0	2	0
Salt Lake City [3]	34	12.9	10.0	2	1	33
San Antonio	56	13.4	15.8	15	13	
San Diego	37	16.2	16.3	2	2	38
San Francisco	148	13.2	9.7	7	3	44
Schenectady	16	9.0	7.8	5	0	157
Seattle	55	7.5	7.4	2	3	21
Somerville	15	7.6	7.2	1	1	35
Spokane	29	13.9	7.7	2	0	52
Springfield, Mass	26	9.1	8.8	3	1	48
Syracuse	51	13.4	11.4	4	4	49
Tacoma	26	12.3	12.2	1	0	26
Toledo	50	8.3	6.3	1	3	10
Trenton	29	10.9	10.7	6	4	102
Washington, D. C	95	9.0	10.1	6	16	34
White	61		8.8	4	9	23
Colored	34	(4)	14.2	2	7	37
Waterbury	13			2	1	58
Wilmington, Del	16	6.5	5.8	1	4	26
Worcester	36	9.5	9.6	5	4	61
Yonkers	9	3.9	6.1	1	3	23
Youngstown	37	11.1	8.3	3	6	40

[3] Deaths for week ended Friday, Aug. 17, 1928.

[4] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

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

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended August 25, 1928, and August 27, 1927

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended August 25, 1928, and August 27, 1927

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927
New England States:								
Maine		5			16		0	0
New Hampshire	1		5		2		0	
Vermont		2			2	9	0	0
Massachusetts	30	52	2	4	46	39	4	0
Rhode Island	4	6			16		0	0
Connecticut	9	19	1	1	11	11	1	0
Middle Atlantic States:								
New York		136		[1] 3		53		5
New Jersey	70	69		2	19	6	2	0
Pennsylvania	58	125			134	58	0	0
East North Central States:								
Ohio	17		2		24		1	
Indiana	6	23	3	16	3	8	0	0
Illinois	70	55	2	6	24	17	10	0
Michigan	47	53	1	1	26	12	2	0
Wisconsin	7	14	10	10	19	42	1	4
West North Central States:								
Minnesota	22	27			6	7	1	4
Iowa	4						1	0
Missouri	19	24	2		12	6	4	1
North Dakota	5	6	2				5	0
South Dakota							0	0
Nebraska	3	4			5	1	0	0
Kansas	3	9	1		2	17	2	0
South Atlantic States:								
Delaware		1			1	1	1	0
Maryland [2]	18	30	2	8	13	5	0	1
District of Columbia	22	2		1	3		0	0
Virginia								
West Virginia	7	7	10	4	7	6	0	1
North Carolina		65				164		0
South Carolina	23	21	239	155		42	0	0
Georgia	10	25	53	20	5	2	1	0
Florida	12	13	25	5	2	7	2	0

[1] New York City only. [2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended August 25, 1928, and August 27, 1927—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927
East South Central States:								
Kentucky	14						0	
Tennessee	6	21	8	5	3	11	3	1
Alabama	13	38	23	12	28	60	1	4
Mississippi	5	27	5				0	
West South Central States:								
Arkansas	3	6	21	14	5	17	0	0
Louisiana	4	12	7	5	2	6	1	0
Oklahoma [3]	20	35	22	8	21	18	0	1
Texas	14	18	9	25	3		0	1
Mountain States:								
Montana	2	4			5	2	1	1
Idaho	1				1	1	1	0
Wyoming	2					1	0	0
Colorado	4	13			2	1	1	1
New Mexico	1	3			2	4	0	0
Arizona	1				4	2	0	0
Utah [3]	2	2	2		1	1	1	0
Pacific States:								
Washington	2	8			17	10	1	1
Oregon	4	1	4	2	8	7	0	2
California	46	67	7	5	11	38	3	3

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927
New England States:								
Maine	1	7	6	8	0	0	4	15
New Hampshire	1		4		0		1	
Vermont	1	0	5	6	0	0	1	0
Massachusetts	32	55	37	55	0	0	14	27
Rhode Island	0	4	6	7	0	0	1	4
Connecticut	2	12	4	8	0	0	6	2
Middle Atlantic States:								
New York		58		91		1		51
New Jersey	8	20	12	29	0	0	15	9
Pennsylvania	12	8	55	109	0	0	36	49
East North Central States:								
Ohio	17	128	42		3		27	
Indiana	0	4	9	30	13	13	32	22
Illinois	6	24	45	60	13	7	53	64
Michigan	1	10	62	68	7	14	17	30
Wisconsin	2	2	26	28	3	6	8	10
West North Central States:								
Minnesota	8	3	29	42	0	0	6	4
Iowa	1		13		0		3	
Missouri	0	6	20	27	1	11	28	18
North Dakota	12	2	19	11	0	1	1	0
South Dakota	0	1	4	3	1	5	2	0
Nebraska	1	4	7	8	5	1	9	6
Kansas	2	3	19	27	7	1	23	19
South Atlantic States:								
Delaware	0	0	2	2	0	0	1	1
Maryland [3]	39	0	10	16	0	0	24	59
District of Columbia	0	1	1	3	0	0	0	5
Virginia	2				0			
West Virginia	24	11	8	24	1	7	30	40
North Carolina		0		33		6		59
South Carolina	1	0	0	14	0	4	82	101
Georgia	1	0	7	20	0	0	40	68
Florida	0	2	2	2	0	0	19	15

[2] Week ended Friday.
[3] Figures for 1928 are exclusive of Oklahoma City and Tulsa; for 1927 are exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended August 25, 1928, and August 27, 1927—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927	Week ended Aug. 25, 1928	Week ended Aug. 27, 1927
East South Central States:								
Kentucky	7		21		4		64	
Tennessee	2	4	13	16	0	7	98	153
Alabama	0	1	9	15	1	0	79	105
Mississippi	0	2	7	5	0	0	46	29
West South Central States:								
Arkansas	0	2	1	2	2	1	43	45
Louisiana	0	2	5	6	0	0	28	39
Oklahoma [3]	0	11	9	14	8	3	95	116
Texas	0	12	5	5	0	4	8	11
Mountain States:								
Montana	13	0	5	17	13	0	2	8
Idaho	6	0	2	1	1	1	1	1
Wyoming	0	1	0	5	0	0	1	1
Colorado	9	2	11	13	0	0	9	15
New Mexico	0	6	2	2	0	0	9	14
Arizona	0	0	0	2	0	0	0	0
Utah [3]	0	0	6	2	0	3	2	4
Pacific States:								
Washington	16	3	2	6	5	9	2	3
Oregon	0	3	9	11	23	8	9	4
California	7	48	49	43	11	3	27	15

[2] Week ended Friday.
[3] Figures for 1928 are exclusive of Oklahoma City and Tulsa; for 1927 are exclusive of Tulsa.

Report for Week Ended August 18, 1928

MASSACHUSETTS

	Cases
Diphtheria	52
Influenza	2
Measles	70
Meningococcus meningitis	1
Poliomyelitis	44
Scarlet fever	45
Typhoid fever	9

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
June, 1928										
District of Columbia	0	45	3	0	601	0	0	126	1	1
July, 1928										
Alabama	8	37	129	417	188	196	5	20	28	246
Arkansas	0	11	52	1,106	88	377	1	8	19	138
California	11	229	46	6	87	10	21	268	69	60
District of Columbia	0	69	1		158	1	0	42	0	2
Florida	2	33	138	51	95	9	3	10	14	41
Georgia	1	16	84	388	90	128	2	23	7	246
Iowa	4	18	0		25		2	69	64	11
Louisiana	3	32	46	154	121	120	0	14	6	134
Maine	2	8	14		229		5	32	0	10
Michigan		210	8	3	1,208		1	390	87	26
Minnesota	14	92	12		57		6	191	5	4
New Jersey	9	347	6		1,255		7	131	2	36
New York	82	837		9	3,804		64	439	5	111
Ohio	19	153	38	1	1,400	0	24	228	54	111
Wisconsin	13	68	71		90		3	244	65	5
Wyoming	1	8	2		2		0	19	3	5

June, 1928

District of Columbia:	Cases
Chicken pox	38
Rabies in animals	7
Whooping cough	46

July, 1928

Actinomycosis:	
California	2
Anthrax:	
Louisiana	2
Ohio	1
Chicken pox:	
Alabama	21
Arkansas	36
California	364
District of Columbia	8
Florida	2
Georgia	23
Iowa	66
Louisiana	4
Maine	37
Michigan	222
Minnesota	131
New Jersey	178
New York	701
Ohio	323
Wisonsin	324
Wyoming	13
Conjunctivitis:	
Georgia	1
Maine	1
Dengue:	
Alabama	13
Georgia	5
Louisiana	4
Dysentery:	
California (amœbic)	2
California (bacillary)	9
Florida	10
Georgia	84
Louisiana	5
Minnesota	1
New Jersey	1
New York	6
German measles:	
California	119
Iowa	1
Maine	11
New Jersey	104
New York	313
Ohio	14
Hookworm disease:	
California	2
Florida	26
Georgia	16
Louisiana	18
Jaundice:	
California	1
Lead poisoning:	
New Jersey	2
Ohio	7
Leprosy:	
Florida	3
Louisiana	1

July, 1928—Continued

Lethargic encephalitis:	Cases
Alabama	2
California	1
District of Columbia	1
Louisiana	4
Michigan	3
New York	16
Ohio	4
Wisconsin	3
Mumps:	
Alabama	26
Arkansas	10
California	234
Florida	6
Georgia	24
Iowa	53
Louisiana	2
Maine	47
Michigan	179
New York	415
Ohio	132
Wisconsin	160
Wyoming	5
Ophthalmia neonatorum:	
Arkansas	2
California	1
New York	4
Ohio	38
Paratyphoid fever:	
Arkansas	2
California	12
Florida	3
Georgia	6
Louisiana	2
Maine	5
New Jersey	3
New York	5
Ohio	1
Puerperal septicemia:	
New York	7
Ohio	4
Rabies in animals:	
California	42
District of Columbia	4
Iowa	18
New York	11
Rabies in man:	
California	1
Michigan	4
New Jersey	1
New York	1
Rocky Mountain spotted or tick fever:	
Wyoming	5
Septic sore throat:	
Georgia	19
Maine	1
Michigan	8
Minnesota	22
New York	14
Ohio	46
Wyoming	1
Tetanus:	
California	12
Florida	4

July, 1928—Continued

Tetanus—Continued	Cases
Georgia	2
Iowa	3
Louisiana	5
Maine	3
Minnesota	1
New York	23
Ohio	3
Trachoma:	
Arkansas	4
California	2
Louisiana	1
Minnesota	3
New Jersey	1
New York	2
Ohio	3
Wisconsin	4
Wyoming	1
Tularaemia:	
California	1
Georgia	1
Louisiana	2
Minnesota	1
Wyoming	4
Typhus fever:	
Alabama	9
Florida	9

July, 1928—Continued

Typhus fever—Continued.	Cases
Georgia	4
New York	1
Undulant (malta) fever:	
Iowa	2
Vincent's angina:	
Maine	9
New York	52
Wyoming	1
Whooping cough:	
Alabama	118
Arkansas	82
California	780
District of Columbia	41
Florida	45
Georgia	100
Iowa	58
Louisiana	41
Maine	95
Michigan	790
Minnesota	192
New Jersey	618
New York	1,421
Ohio	1,007
Wisconsin	549
Wyoming	12

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 95 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 30,770,000. The estimated population of the 91 cities reporting deaths is more than 30,850,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended August 11, 1928, and August 13, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
43 States	750	1,001	
95 cities	354	533	467
Measles:			
42 States	1,079	889	
95 cities	343	165	
Poliomyelitis:			
43 States	217	248	
Scarlet fever:			
43 States	707	946	
95 cities	211	341	357
Smallpox:			
43 States	209	222	
95 cities	6	22	21
Typhoid fever:			
43 States	983	1,190	
95 cities	158	144	182
Deaths reported			
Influenza and pneumonia:			
91 cities	377	323	
Smallpox:			
91 cities	0	0	

City reports for week ended August 11, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviation from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	1	1	0	0	0	0	2	0
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	3	0	1
Manchester	84,000	0	1	0	0	0	0	0	0
Vermont:									
Barre	[1] 10,008	0	0	0	0	0	0	0	0
Massachusetts:									
Boston	787,000	11	27	12	0	0	5	0	7
Fall River	131,000	0	2	4	0	0	10	0	1
Springfield	145,000	2	0	1	0	0	9	1	0
Worcester	193,000	0	3	2	0	0	8	5	0
Rhode Island:									
Pawtucket	71,000	0	0	0	0	0	0	0	0
Providence	275,000	0	4	3	0	0	57	0	3
Connecticut:									
Bridgeport	(2)	0	4	1	0	0	6	0	2
Hartford	164,000	0	2	2	0	0	7	1	5
New Haven	182,000	0	1	1	0	0	3	0	2
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	4	8	6		0	1	5	13
New York	5,924,000	10	104	79	1	6	54	6	97
Rochester	321,000	1	3	0		0	10	1	1
Syracuse	185,000	4	2	1		0	10	2	5
New Jersey:									
Camden	131,000	0	2	4	0	0	0	0	0
Newark	459,000	4	6	8	0	0	4	5	3
Trenton	134,000	3	1	0	0	0	1	0	2
Pennsylvania:									
Philadelphia	2,008,000	5	35	15	0	2	17	4	13
Pittsburgh	637,000		13			2			13
Reading	114,000	1	2	0	0	0	3	0	1
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	1	4	2	0	0	0	0	3
Cleveland	960,000	7	21	16	10	0	35	8	9
Columbus	285,000	0	2	4	0	0	8	1	2
Toledo	295,000	1	5	4	2	2	6	1	3
Indiana:									
Fort Wayne	99,900	0	1	1	0	0	0	0	0
Indianapolis	367,000	0	3	2	0	0	6	3	5
South Bend	81,700	0	1	1	0	0	0	0	2
Terre Haute	71,900	0	0	0	0	0	0	0	1
Illinois:									
Chicago	3,048,000	14	45	57	0	1	11	6	22
Springfield	64,700	0	1	0	0	0	0	4	0

[1] Estimated July 1, 1925.

[2] No estimate made.

City reports for week ended August 11, 1928—Continued

Division, State, and city	Population, July 1, 1928, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued									
Michigan:									
Detroit	[3] 1,242,044	3	26	22	0	0	23	4	2
Flint	136,000	0	3	2	0	0	2	0	3
Grand Rapids	156,000	0	1	1	0	0	1	0	0
Wisconsin:									
Kenosha	52,700	0	0	0	0	0	0	0	0
Milwaukee	517,000	6	8	3	0	0	10	1	1
Racine	69,400	0	1	0	0	0	0	0	0
Superior	[1] 39,671	0	0	1	0	0	0	0	1
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	0	1	0	0	0	0	2	2
Minneapolis	434,000	4	11	4	0	1	2	1	5
St. Paul	248,000	0	8	1	0	0	0	0	4
Iowa:									
Des Moines	146,000	0	2	0	0	-------	0	0	-------
Sioux City	78,000	-------	1	-------	-------	-------	-------	-------	-------
Waterloo	36,900	0	0	0	0	-------	0	4	-------
Missouri:									
Kansas City	375,000	2	2	2	0	0	1	2	8
St. Joseph	78,400	0	0	2	0	1	0	0	4
St. Louis	830,000	0	18	18	0	0	4	3	-------
North Dakota:									
Fargo	[1] 26,403	0	0	0	0	0	0	0	0
Grand Forks	[1] 14,811	1	0	0	0	-------	0	0	-------
South Dakota:									
Aberdeen	[1] 15,036	2	0	0	0	-------	0	0	-------
Sioux Falls	[1] 30,127	0	0	0	0	-------	0	0	-------
Nebraska:									
Lincoln	62,000	5	0	0	0	0	0	2	0
Omaha	216,000	0	2	1	0	0	0	0	2
Kansas:									
Topeka	56,000	0	1	2	0	0	1	1	0
Wichita	92,500	0	0	0	0	0	0	0	1
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	0	1	0	0	0	0	0	1
Maryland:									
Baltimore	808,000	3	11	9	0	0	2	6	6
Cumberland	[1] 33,741	0	0	0	0	0	0	0	0
Frederick	[1] 12,035	0	0	0	0	0	0	0	0
District of Columbia:									
Washington	528,000	1	5	12	0	0	4	0	6
Virginia:									
Lynchburg	[3] 38,493	-------	0	-------	-------	-------	-------	-------	-------
Norfolk	174,000	0	0	0	0	0	1	0	0
Richmond	189,000	0	4	3	0	0	3	0	6
Roanoke	61,900	0	1	0	0	0	0	0	0
West Virginia:									
Charleston	50,700	2	0	0	0	0	0	0	0
Wheeling	[1] 56,208	0	0	0	0	0	1	0	2
North Carolina:									
Raleigh	[1] 30,371	-------	1	-------	-------	-------	-------	-------	-------
Wilmington	37,700	1	0	0	0	0	0	0	1
Winston-Salem	71,800	0	1	1	0	0	1	0	0
South Carolina:									
Charleston	74,100	0	0	0	25	0	0	1	1
Columbia	41,800	0	0	0	0	0	0	3	3
Greenville	[1] 27,311	0	0	0	0	0	0	0	2
Georgia:									
Atlanta	(2)	1	2	1	5	1	0	0	3
Brunswick	[1] 16,809	-------	0	-------	-------	-------	-------	-------	-------
Savannah	94,900	0	1	0	0	0	0	0	0
Florida:									
St. Petersburg	[1] 26,847	-------	0	-------	-------	1	-------	-------	0
Tampa	102,000	0	1	1	6	3	0	0	1

[1] Estimated, July 1, 1925. [2] No estimate made. [3] Special census.

City reports for week ended August 11, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reportrd	Deaths reported			
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	0	0	0	0	0	0	0	3
Louisville	311,000	0	2	0	1	1	0	0	12
Tennessee:									
Memphis	177,000	0	2	0	0	0	0	0	2
Nashville	137,000	0	1	2	0	0	2	0	2
Alabama:									
Birmingham	211,000	1	2	0	4	1	3	1	1
Mobile	66,800	0	0	0	2	0	0	0	1
Montgomery	47,000	0	1	0	1	-------	0	0	-------
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	0	0	0	0	-------	0	4	-------
Little Rock	75,900	0	0	0	0	0	0	0	0
Louisiana:									
New Orleans	419,000	0	5	6	5	6	1	0	13
Shreveport	59,500	0	1	0	0	0	0	0	1
Oklahoma:									
Oklahoma City	(2)	0	1	1	0	1	0	0	1
Texas:									
Dallas	203,000	1	3	3	0	0	0	0	2
Fort Worth	159,000	0	2	1	0	0	0	0	2
Galveston	49,100	0	0	0	0	0	0	0	1
Houston	[1] 164,954	0	2	3	0	1	0	0	5
San Antonio	205,000	0	1	1	0	0	0	0	4
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	0	0	0	0	0	0	0
Great Falls	[1] 29,883	0	0	0	0	0	0	0	1
Helena	[1] 12,037	0	0	1	0	0	0	0	0
Missoula	[1] 12,663	0	0	0	0	0	0	0	0
Idaho:									
Boise	[1] 23,042	0	0	0	0	0	0	0	0
Colorado:									
Denver	285,000	5	9	2	-------	1	3	8	6
Pueblo	43,900	0	1	0	0	0	1	0	0
New Mexico:									
Albuquerque	[1] 21,000	0	0	0	0	0	0	0	0
Utah:									
Salt Lake City	133,000	7	2	1	0	0	1	2	1
Nevada:									
Reno	[1] 12,665	-------	0	-------	-------	-------	-------	-------	-------
PACIFIC									
Washington:									
Seattle	(2)	2	2	0	0	-------	1	2	-------
Spokane	109,000	4	1	7	0	-------	1	0	-------
Tacoma	106,000	2	2	0	0	0	2	2	0
Oregon:									
Portland	[1] 282,383	5	4	1	0	0	2	0	3
California:									
Los Angeles	(2)	10	25	16	2	0	2	14	11
Sacramento	73,400	1	1	0	0	0	0	0	2
San Francisco	567,000	1	9	4	0	0	2	3	4

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended August 11, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	0	4	0	0	0	0	1	1	0	1	11
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	8
Manchester	0	0	0	0	0	1	0	0	1	0	20
Vermont:											
Barre	0	0	0	0	0	0	0	0	0	0	1
Massachusetts:											
Boston	15	11	0	0	0	8	3	3	0	22	198
Fall River	0	0	0	0	0	3	1	1	0	1	29
Springfield	1	0	0	0	0	1	1	0	0	0	23
Worcester	2	2	0	0	0	4	0	0	0	2	38
Rhode Island:											
Pawtucket	0	0	0	0	0	0	0	0	0	0	12
Providence	2	9	0	0	0	1	1	1	0	4	62
Connecticut:											
Bridgeport	2	1	0	0	0	1	1	0	0	3	36
Hartford	2	2	0	0	0	0	1	0	0	7	33
New Haven	1	0	0	0	0	0	1	1	0	24	25
MIDDLE ATLANTIC											
New York:											
Buffalo	4	2	0	0	0	13	2	0	0	73	133
New York	30	25	0	0	0	81	33	24	2	92	1,352
Rochester	2	1	0	0	0	1	1	1	0	6	71
Syracuse	3	0	0	0	0	2	0	0	0	13	37
New Jersey:											
Camden	0	0	0	0	0	1	0	0	0	8	34
Newark	4	2	0	0	0	13	1	1	0	42	87
Trenton	1	0	0	0	0	3	1	0	0	3	42
Pennsylvania:											
Philadelphia	18	6	0	0	0	38	10	3	0	126	436
Pittsburgh	9	0	------	------	------	12	2	------	1	------	167
Reading	0	0	0	0	0	1	1	0	0	20	30
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	4	2	1	0	0	5	2	2	0	6	113
Cleveland	11	7	0	0	0	21	4	1	0	53	179
Columbus	2	5	0	0	0	6	1	4	0	5	74
Toledo	3	2	1	0	0	8	2	3	0	33	72
Indiana:											
Fort Wayne	0	1	0	0	0	1	0	0	0	0	20
Indianapolis	2	2	1	0	0	3	2	7	2	5	104
South Bend	1	0	0	0	0	0	0	0	0	1	20
Terre Haute	0	0	0	0	0	0	0	0	0	1	16
Illinois:											
Chicago	26	18	0	0	0	46	6	2	0	96	643
Springfield	1	0	0	1	0	1	0	0	0	1	20
Michigan:											
Detroit	23	12	2	0	0	19	5	5	0	198	230
Flint	4	8	0	0	0	1	0	0	0	4	37
Grand Rapids	2	2	0	0	0	0	1	0	0	7	22
Wisconsin:											
Kenosha	1	0	1	0	0	0	0	0	0	3	5
Milwaukee	5	4	1	0	0	7	1	1	0	109	89
Racine	1	1	0	0	0	0	0	0	0	4	11
Superior	1	2	0	0	0	0	0	0	0	0	8
WEST NORTH CENTRAL											
Minnesota:											
Duluth	3	4	0	0	0	4	0	0	0	8	29
Minneapolis	11	8	1	0	0	4	1	2	0	1	79
St. Paul	5	4	1	0	0	4	1	1	0	25	52
Iowa:											
Des Moines	2	2	0	0	------	------	0	0	------	0	36
Sioux City	0	------	0	------	------	------	0	------	------	------	------
Waterloo	1	2	0	0	------	------	1	0	------	1	------

City reports for week ended August 11, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST NORTH CENTRAL—continued											
Missouri:											
Kansas City	2	1	0	0	0	8	2	1	0	7	79
St. Joseph	0	3	0	0	0	5	0	0	0	0	43
St. Louis	6	4	0	0	0	15	6	8	1	16	207
North Dakota:											
Fargo	1	2	0	0	0	1	0	0	0	4	6
Grand Forks	0	0	0	0			0	0		0	
South Dakota:											
Aberdeen	0	0	0	0			0	0		0	
Sioux Falls	1	0	0	0			0	0		0	
Nebraska:											
Lincoln	0	1	0	0	0	0	0	0	0	7	19
Omaha	1	2	0	1	0	6	0	1	0	2	50
Kansas:											
Topeka	1	3	0	0	0	2	0	0	0	10	10
Wichita	1	2	0	0	0	2	1	0	0	10	28
SOUTH ATLANTIC											
Delaware:											
Wilmington	0	0	0	0	0	0	0	0	0	5	27
Maryland:											
Baltimore	6	3	0	0	0	21	9	4	1	107	112
Cumberland	0	1	0	0	0	0	1	1	0	0	37
Frederick	0	0	0	0	0	0	0	1	0	0	3
District of Col.:											
Washington	3	4	0	0	0	21	5	3	1	5	143
Virginia:											
Lynchburg	0		0				0				
Norfolk	0	1	0	0	0	1	2	0	1	0	
Richmond	2	0	0	0	0	4	2	4	0	2	57
Roanoke	1	2	0	0	0	1	1	1	0	0	16
West Virginia:											
Charleston	0	0	0	0	0	1	2	6	0	0	28
Wheeling	1	1	0	0	0	0	0	0	0	0	18
North Carolina:											
Raleigh	0		0				1				
Wilmington	0	0	0	0	0	1	0	0	0	3	15
Winston-Salem	0	0	0	0	0	1	2	3	1	1	28
South Carolina:											
Charleston	0	0	0	1	0	0	2	1	0	0	33
Columbia	1	0	0	0	0	1	2	0	0	1	24
Greenville	0	0	0	0	0	0	2	0	1	0	7
Georgia:											
Atlanta	2	1	2	0	0	3	4			0	88
Brunswick	0		0				0				
Savannah	0	1	0	0	0	2	1	1	0	0	26
Florida											
St. Petersburg	0		0		0	0	0		0		7
Tampa	1	0	0	0	0	1	1	2	0	0	20
EAST SOUTH CENTRAL											
Kentucky:											
Covington	0	0	0	0	0	2	0	0	0	3	25
Louisville	1	4	1	0	0	0	5	1	0	5	96
Tennessee:											
Memphis	1	1	0	0	0	2	7	16	0	4	71
Nashville	1	2	0	0	0	2	7	6	1	2	35
Alabama:											
Birmingham	2	0	0	0	0	8	6	8	0	6	78
Mobile	0	0	1	0	0	2	1	1	1	0	26
Montgomery	0	0	0	0			1	3		1	
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0			0	3		1	
Little Rock	0	0	0	0	0	3	1	1	0	0	
Louisiana:											
New Orleans	2	1	0	0	0	15	4	4	0	4	150
Shreveport	0	1	0	0	0	3	1	2	0	3	35
Oklahoma:											
Oklahoma City	1	0	1	0	0	2	4	3	0	0	31

City reports for week ended August 11, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST SOUTH CENTRAL—continued											
Texas:											
Dallas	2	4	0	0	0	2	4	5	0	13	54
Fort Worth	1	1	0	0	0	4	1	9	0	8	28
Galveston	0	0	0	0	0	0	1	1	0	0	12
Houston	0	1	0	0	0	6	1	1	1	0	60
San Antonio	0	2	0	0	0	4	3	1	0	0	78
MOUNTAIN											
Montana:											
Billings	0	0	0	0	0	0	0	0	0	0	11
Great Falls	1	0	0	0	0	1	0	0	0	1	14
Helena	1	0	0	0	0	0	0	0	0	0	5
Missoula	0	0	0	0	0	0	0	1	1	0	7
Idaho:											
Boise	0	0	0	0	0	0	0	0	0	0	7
Colorado:											
Denver	2	0	0	0	0	7	2	0	0	16	65
Pueblo	1	1	0	0	0	1	1	0	0	2	9
New Mexico:											
Albuquerque	0	0	0	0	0	3	0	0	0	0	13
Utah:											
Salt Lake City	1	1	0	0	0	0	1	0	0	12	33
Nevada:											
Reno	0		0				0				
PACIFIC											
Washington:											
Seattle	3	1	1	0			1	3		6	
Spokane	3	1	2	2			0	0		3	
Tacoma	1	0	1	0	0	0	0	0	0	1	29
Oregon:											
Portland	2	2	5	11	0	3	1	1	0	0	64
California:											
Los Angeles	8	6	4	0	0	31	4	2	0	50	222
Sacramento	1	2	1	1	0	1	2	1	0	5	24
San Francisco	5	5	0	0	0	10	1	0	0	13	142

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	0	1	0	0	0	0	2	1	2
Springfield	1	0	0	0	0	0	0	2	0
Worcester	0	0	2	2	0	0	0	0	0
Connecticut:									
Hartford	0	1	0	0	0	0	1	0	0
MIDDLE ATLANTIC									
New York:									
Buffalo	1	1	1	1	0	0	0	0	0
New York [1]	37	17	5	3	0	0	7	46	8
Pennsylvania: [1]									
Philadelphia	1	1	1	1	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland	0	0	0	0	0	0	1	2	0
Illinois:									
Chicago [1]	6	0	0	0	0	0	3	0	1

[1] Rabies (in man): 1 case and 1 death at New York City, 1 death at Pittsburgh, Pa., and 1 case and 1 death at Chicago, Ill.

City reports for week ended August 11, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Csaes	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL—continued									
Michigan:									
Detroit	1	2	0	0	0	0	1	1	0
Wisconsin:									
Milwaukee	0	0	0	0	0	0	0	1	1
Racine	0	0	1	1	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	1	0	0	0	0	0	0	0	0
Minneapolis	0	0	0	0	0	0	1	0	1
Missouri:									
St. Louis	1	3	0	0	0	0	0	0	0
North Dakota:									
Fargo	0	0	1	0	0	0	0	1	0
SOUTH ATLANTIC [3]									
Maryland:									
Baltimore [2]	1	0	0	2	0	0	2	15	0
District of Columbia:									
Washington	0	0	0	0	0	0	0	1	0
North Carolina:									
Winston-Salem	0	0	0	0	1	0	0	0	0
South Carolina:									
Charleston [3]	0	0	0	0	1	1	0	0	0
Columbia	0	0	0	0	0	1	0	0	0
Georgia:									
Atlanta	0	0	0	0	0	3	0	0	0
Savannah [3]	0	0	0	0	2	2	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	0	0	0	0	0	1	0	1	0
Nashville [4]	0	1	0	0	0	0	0	0	0
Alabama: [2]									
Birmingham	0	0	0	0	2	3	1	0	0
Montgomery	0	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	0	0	0	0	1	0	0	0	0
Louisiana:									
New Orleans	0	0	0	0	3	0	0	0	0
Shreveport	0	0	0	1	0	2	0	0	0
Oklahoma:									
Oklahoma City	1	1	0	0	0	0	0	0	0
Texas:									
Dallas	0	0	0	0	0	1	0	0	0
Fort Worth	0	0	0	0	0	1	1	0	0
San Antonio	0	1	0	0	0	1	0	0	0
MOUNTAIN									
Montana:									
Billings	0	0	0	0	0	0	0	1	1
Missoula	1	1	0	0	0	0	0	0	0
New Mexico:									
Albuquerque	0	0	1	0	0	0	0	0	0
Utah:									
Salt Lake	2	1	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	0	0	0	0	0	0	0	6	0
Spokane	0	0	0	0	0	0	0	4	0
Tacoma	0	0	0	0	0	0	0	3	1
Oregon:									
Portland	0	0	0	0	0	0	0	2	0
California:									
Los Angeles	1	0	0	0	0	0	1	0	0
Sacramento	0	1	0	0	0	0	0	0	0
San Francisco	1	0	0	0	0	0	0	0	0

[2] Typhus fever: 5 cases; 1 case at Baltimore, Md., 1 case at Savannah, Ga., 2 cases at Tampa, Fla., and 1 case at Mobile, Ala.
[3] Dengue: 2 cases at Charleston, S. C.
[4] Rabies (in man): 1 death at Nashville, Tenn.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended August 11, 1928, compared with those for a like period ended August 13, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1928 and 1927, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,657,000 in 1928 and 31,050,000 in 1927. The 95 cities reporting deaths had nearly 30,961,000 estimated population in 1928 and nearly 30,370,000 in 1927. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, July 8 to August 11, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	July 14, 1928	July 16, 1927	July 21, 1928	July 23, 1927	July 28, 1928	July 30, 1927	Aug. 4, 1928	Aug. 6, 1927	Aug. 11, 1928	Aug. 13, 1927
101 cities	83	114	69	[2] 92	[3] 67	[3] 94	[4] 65	78	[5] 60	90
New England	80	133	46	63	46	91	57	63	60	70
Middle Atlantic	116	164	90	105	81	103	67	92	[6] 59	97
East North Central	82	93	77	108	64	102	73	80	73	94
West North Central	53	53	53	53	58	55	[7] 78	42	[8] 60	67
South Atlantic	58	83	46	[2] 87	61	88	51	65	[9] 49	81
East South Central	5	35	25	25	50	30	[10] 25	30	10	25
West South Central	40	70	56	124	68	70	40	91	52	91
Mountain	71	81	35	99	62	117	35	134	[11] 86	179
Pacific	72	112	54	65	[3] 57	[3] 121	[3] 84	76	69	107

MEASLES CASE RATES

101 cities	264	154	163	[2] 108	[3] 128	[3] 58	[4] 99	48	[5] 58	28
New England	777	242	503	198	651	170	526	93	248	63
Middle Atlantic	349	122	203	92	126	45	78	43	[6] 52	28
East North Central	215	110	145	90	83	47	84	29	63	19
West North Central	117	105	62	48	29	40	[7] 7	34	[8] 16	22
South Atlantic	124	220	89	[2] 140	70	69	56	38	[9] 22	14
East South Central	200	61	80	25	80	46	[10] 19	10	25	15
West South Central	24	103	4	54	0	58	0	54	4	21
Mountain	239	170	186	99	80	63	97	45	[11] 45	36
Pacific	26	447	20	279	[3] 54	[3] 66	[3] 30	144	20	60

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1928, and 1927, respectively.
[2] Norfolk, Va., not included.
[3] Seattle, Wash., and Spokane, Wash., not included.
[4] Kansas City, Mo., Birmingham, Ala., Seattle, Wash., and Spokane, Wash., not included.
[5] Pittsburgh, Pa., Sioux City, Iowa, Lynchburg, Va., Raleigh, N. C., Brunswick, Ga., and Reno, Nev., not included.
[6] Pittsburgh, Pa., not included.
[7] Kansas City, Mo., not included.
[8] Sioux City, Iowa, not included.
[9] Lynchburg, Va., Raleigh, N. C., and Brunswick, Ga., not included.
[10] Birmingham, Ala., not included.
[11] Reno, Nev., not included.

Summary of weekly reports from cities, July 8 to August 11, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

SCARLET FEVER CASE RATES

	Week ended—									
	July 14, 1928	July 16, 1927	July 21, 1928	July 23, 1927	July 28, 1928	July 30, 1927	Aug. 4, 1928	Aug. 6, 1927	Aug. 11, 1928	Aug. 13, 1927
101 cities	52	84	56	[2] 64	[3] 42	[3] 63	[4] 48	51	[5] 36	57
New England	87	130	78	100	57	107	53	51	67	93
Middle Atlantic	37	91	33	50	27	39	28	35	[6] 19	39
East North Central	71	89	88	75	56	87	58	75	42	73
West North Central	35	71	72	79	60	79	[7] 75	61	[8] 70	75
South Atlantic	35	56	28	[2] 40	35	40	42	27	[9] 25	32
East South Central	55	30	45	30	30	41	[10] 76	51	35	35
West South Central	28	37	32	45	20	25	76	25	36	58
Mountain	62	224	44	99	27	152	27	126	[11] 18	117
Pacific	74	50	79	91	[3] 71	[3] 66	[3] 68	60	38	63

SMALLPOX CASE RATES

101 cities	7	9	4	[2] 10	[3] 2	[3] 5	[4] 3	6	[5] 1	4
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	[6] 0	0
East North Central	7	17	3	13	1	9	7	9	1	5
West North Central	12	14	14	12	4	6	[7] 0	0	[8] 2	4
South Atlantic	0	9	5	[2] 12	0	4	2	9	[9] 2	5
East South Central	5	25	10	35	25	10	[10] 13	5	0	0
West South Central	4	8	4	8	0	12	0	17	0	0
Mountain	88	36	18	117	18	27	35	18	[11] 0	9
Pacific	31	13	10	21	[3] 3	[3] 10	[3] 10	21	8	24

TYPHOID FEVER CASE RATES

101 cities	18	21	18	[2] 20	[3] 22	[3] 21	[4] 22	25	[5] 27	25
New England	14	19	7	16	11	9	5	7	16	30
Middle Atlantic	9	11	12	8	17	13	17	13	[6] 15	15
East North Central	11	8	7	9	5	11	10	9	14	14
West North Central	16	16	12	14	23	16	[7] 9	26	[8] 26	22
South Atlantic	32	43	30	[2] 50	35	36	44	58	[9] 49	45
East South Central	60	152	100	122	120	117	[10] 140	183	175	96
West South Central	64	74	88	54	104	54	60	50	72	87
Mountain	9	27	0	27	27	72	0	45	[11] 9	36
Pacific	23	8	18	16	[3] 17	[3] 24	[3] 27	13	15	10

INFLUENZA DEATH RATES

95 cities	5	3	5	[2] 3	4	3	[12] 6	2	[13] 5	3
New England	5	5	9	0	5	2	2	0	0	2
Middle Atlantic	3	2	4	4	2	4	6	1	5	2
East North Central	4	1	5	2	6	1	3	0	1	2
West North Central	4	2	2	2	2	0	[7] 2	2	4	6
South Atlantic	7	5	7	[2] 2	5	2	14	5	[9] 7	4
East South Central	5	5	0	16	16	11	[10] 0	5	10	5
West South Central	25	8	4	0	12	8	12	4	29	13
Mountain	18	9	9	9	9	0	0	9	[11] 9	0
Pacific	10	7	3	3	0	3	10	3	0	3

[2] Norfolk, Va., not included.
[3] Seattle, Wash., and Spokane, Wash., not included.
[4] Kansas City, Mo., Birmingham, Ala., Seattle, Wash., and Spokane, Wash., not included.
[5] Pittsburgh, Pa., Sioux City, Iowa, Lynchburg, Va., Raleigh, N. C., Brunswick, Ga., and Reno, Nev., not included.
[6] Pittsburgh, Pa., not included.
[7] Kansas City, Mo., not included.
[8] Sioux City, Iowa., not included.
[9] Lynchburg, Va., Raleigh, N. C., and Brunswick, Ga., not included.
[10] Birmingham, Ala., not included.
[11] Reno, Nev., not included.
[12] Kansas City, Mo., and Birmingham, Ala., not included.
[13] Lynchburg, Va., Raleigh, N. C., Brunswick, Ga., and Reno, Nev., not included.

Summary of weekly reports from cities, July 8 to August 11, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

PNEUMONIA DEATH RATES

	Week ended—									
	July 14, 1928	July 16, 1927	July 21, 1928	July 23, 1927	July 28, 1928	July 30, 1927	Aug. 4, 1928	Aug. 6, 1927	Aug. 11, 1928	Aug. 13, 1927
95 cities	60	56	56	[2] 56	43	49	[12] 52	47	[12] 59	55
New England	67	56	55	56	34	49	57	33	48	77
Middle Atlantic	72	61	60	59	51	56	60	46	72	57
East North Central	54	45	57	55	29	42	31	44	33	41
West North Central	26	31	26	21	20	17	[7] 43	43	53	43
South Atlantic	49	61	51	[2] 73	84	43	49	52	[9] 58	70
East South Central	78	69	52	48	105	48	[10] 81	53	110	69
West South Central	70	68	53	64	57	85	86	68	107	55
Mountain	62	63	80	45	80	36	62	54	[11] 72	68
Pacific	54	97	81	72	10	79	78	62	57	55

[2] Norfolk, Va., not included.
[7] Kansas City, Mo., not included.
[9] Lynchburg, Va., Raleigh, N. C., Brunswick, Ga., not included.
[10] Birmingham, Ala., not included.
[11] Reno, Nev., not included.
[12] Kansas City, Mo., and Birmingham, Ala., not included.
[13] Lynchburg, Va., Raleigh, N. C., Brunswick, Ga., and Reno, Nev., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1928 and 1927, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1928	1927	1928	1927
Total	101	95	31,657,000	31,050,300	30,960,700	30,369,500
New England	12	12	2,274,400	2,242,700	2,274,400	2,242,700
Middle Atlantic	10	10	10,732,400	10,594,700	10,732,400	10,594,700
East North Central	16	16	7,991,400	7,820,700	7,991,400	7,820,700
West North Central	12	10	2,683,500	2,634,500	2,566,400	2,518,500
South Atlantic	21	21	2,981,900	2,890,700	2,981,900	2,890,700
East South Central	7	6	1,048,300	1,028,300	1,000,100	980,700
West South Central	8	7	1,307,600	1,260,700	1,274,100	1,227,800
Mountain	9	9	591,100	581,600	591,100	581,600
Pacific	6	4	2,046,400	1,996,400	1,548,900	1,512,100

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended August 4, 1928.—The following report for the week ended August 4, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva.

Plague, cholera, or smallpox was reported at the following ports:

PLAGUE

Aden.—Aden.
India.—Bombay, Rangoon.

CHOLERA

India.—Bombay, Calcutta, Madras, Rangoon, Vizagapatam.
French India.—Pondicherry.
Siam.—Bangkok.
China.—Shanghai.
Philippine Islands.—Manila.

SMALLPOX

India.—Bombay, Calcutta, Madras, Rangoon, Negapatam.
French India.—Pondicherry.
Indo-China.—Pnompenh.
Dutch East Indies.—Belawan Deli, Pontianak
China.—Hong Kong, Shanghai.
Kwantung.—Dairen, Port Arthur.

BRAZIL

Rio de Janeiro—Yellow fever—May 31 to August 15, 1928.—The first case of yellow fever at Rio de Janeiro, Brazil, this year was reported May 31. In June there were 55 cases; in July 40 cases; and during the first half of August 8 cases. In all there have been 56 deaths from yellow fever at Rio de Janeiro this year.

CANADA

Provinces—Communicable diseases—Week ended August 4, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended August 4, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever				1				1
Influenza	13							13
Poliomyelitis			1	1			2	4
Smallpox			5	2		4	10	21
Typhoid fever		1	22	21	2	2		48

Quebec Province—Communicable diseases—Week ended August 11, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended August 11, 1928, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	2	Scarlet fever	23
Chicken pox	2	Smallpox	9
Diphtheria	29	Tuberculosis	34
Measles	7	Typhoid fever	13

CZECHOSLOVAKIA

Communicable diseases—June, 1928.—During the month of June, 1928, communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	10	4	Paratyphoid fever	6	--------
Cerebrospinal meningitis	25	4	Puerperal fever	50	21
Diphtheria	639	41	Scarlet fever	1,609	28
Dysentery	13	1	Trachoma	308	--------
Malaria	357	--------	Typhoid fever	421	42
Rabies	4	--------			

GREECE

Athens and vicinity—Dengue.—Under date of August 22, 1928, more than 80,000 cases of dengue were reported in Athens, Greece, and the surrounding territory.

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

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given:

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	Week ended— June, 1928				July, 1928				August, 1928		
							9	16	23	30	7	14	21	28	4	11	18
Ceylon: Colombo	C										1						
	D										1						
China:																	
Canton	C			2		1	1			1		2	1	3			
	D			2		1	1			1		2	1	3			
Shanghai	C																P
Swatow	C									3	7						
India	C	12,391	13,236	21,279	32,564	30,177	7,479	8,174	8,028								
	D	6,750	7,282	11,877	20,432	20,162	5,361	5,355	5,054								
Bassein	D	1	2	51	41	40		8									
Bombay	C	1	1	8		1					4		2				
	D		1	3							3		2	6			
Calcutta	C	203	341	664	446	552	135	133	119	75	65	62	48				
	D	112	241	442	428	410	83	85	97	58	45	42	26	20			
Madras	C	2	14	10	22	27		3	14	12	13	4	10				
	D	4	18	4	18	16	6	1	5	9	5	3	6	17			
Madras Presidency	C	4,681	2,961	1,483		1,314	978										
	D	2,660	1,618	812		675	460										
Negapatam	C	4	4														
	D	6	4		2					13							
Rangoon	C	6	29	22	23	7	8	2	4				1				
	D	2	18	16	15	5	5	2	2								
Tuticorin	C			10	110												
	D			9	71												
Vizagapatam	D											4	1	2			
India (French):																	
Chandernagor	C	6	5	7										2			
	D	1	5	6										1			
Karikal	C	32	6		1												
	D	19	5		1												
Pondicherry	C	12	33	1	8							1		2		1	
	D	10	19	1	8							1		2			

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

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	Week ended— June, 1928				July, 1928				August, 1928		
							9	16	23	30	7	14	21	28	4	11	18
Indo-China (see also table below):																	
Pnompenh	C										1	2	1	1			
	D										1	2	1	1			
Saigon	C	4	16	96	116	15	5	1					2				
	D	1	8	59	76	9	1						1				
Tourane	C							1									
	D							1									
Kwangchow-Wan (see table below).																	
Persian Gulf:																	
Island of Henjam	C												1				
Jask	C													1			
Philippine Islands:																	
Cebu port	C													1			
Manila	C											4			1		
Siam	C	200	295	291	349	202	51	49	43	60	58	35	10	60			
	D	139	214	218	234	127	36	30	30	48	39	29	7	48			
Ayudhaya	C						2										
	D						1										
Bangkok	C	101	60	60	74	50	3	3	1		3	5	1		1		
	D	66	36	33	35	26		2	2			2	1				
Trad	C							1									
Straits Settlements: Singapore	C	3		2	1												
	D	1		2	1												
On vessel:																	
S. S. Hawaii Maru at Singapore from Saigon, French Indo-China	C			11													

Place		July-September, 1927	October-December, 1927	January-March, 1928	April, 1928	May, 1928			June, 1928			July, 1928	
						1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20
Indo-China (French) (see also table above):													
Annam	C	3,179	370	389	46	4	26	13	22	8	9	8	5
Cambodia	C	251	337	312	196	34	47	20	28	82	111	92	25
Cochin-China	C	460	391	1,407	933	140	139	125	143	109	77	65	55
Laos	C	246	77										
Tonkin	C	1,297	3	1	6	9	1	16	8	2	1	5	1
Kwangchow-Wan	C	16					16						

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		Jan. 15-Feb. 11, 1928	Feb. 12-Mar. 10, 1928	Mar. 11-Apr. 7, 1928	Apr. 8-May 5, 1928	May 6-June 2, 1928	Week ended— June, 1928				July, 1928				August, 1928		
							9	16	23	30	7	14	21	28	4	11	18
Algeria (see also table below):																	
Algiers	C				1												
Oran	C					1	2										
Arabia: Aden	C	178	343	651	924	7		1									
	D	104	206	529	191	9		1									
Plague-infected rats		P	P														
Argentina:																	
Avellaneda	C					1											
	D					1											
Buenos Aires	C	2				6			1								
	D					3		1		1							
Cordoba Province	C				5												
Entre Rios	C						2	1		2							
Loreto	C					3											
Rosario	C	4	1			1					1						
Santa Fe	C						7	1	1		1						
Santiago del Estero	C		1				9	1			1						
Suardi	C					2											
Azores: St. Michaels Island	C	8	3	3	5	1	1										
	D	4	1	2	2	1	1										

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

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	Week ended— June, 1928				July, 1928				August, 1928		
							9	16	23	30	7	14	21	28	4	11	18
Bolivia: Valle Grande	C														P		
Brazil:																	
Bahia	C	5	24	28	6	3											
	D	4	19	21	6	3											
Porto Alegre	C		1														
Rio de Janeiro	C	4	3	3													
	D	1	2	3													
Plague-infected rats		1															
British East Africa (see also table below):																	
Tanganyiki	C	2	3														
	D	2	3		10						24						
Uganda	C	23	13			84	50		55								
	D	18	10			70	42		43								
Canary Islands:																	
Arrecife	C					1											
	D					1											
Lanzarote Village	C					1											
Las Palmas	C	1	1	4													
	D	1	1														
Teneriffe	C		10														
	D		4														
Ceylon: Colombo	C	3	11	7	1	4	2										
	D	2	6	5	1	2	2										
Plague-infected rats		5	6														
China:																	
Amoy	C					5						P					
Hong Kong	C				2				1					1			
	D								1								
Dutch East Indies:																	
Celebes—Makassar	C	5	1														
	D	5	1														
Java	D	737	454														
Batavia and West Java	C	137	103	80	47	65	22	16	8	15	6						
	D	135	103	80	47	65	22	16	8	15	6						
Plague-infected rats				3	7	9	2	1		1			1	1			

East Java and Madura	C	7		4	4												
	D	7		4	4												
Kedoe Residency	C				4						P						
Surabaya Residency	C		1	1	1												
	D			1	1												
Ecuador (see also table below):																	
Alausi	C					1											
Egypt:																	
Alexandria	C	2	1			1									1	1	
	D	2	1			2											
Assiout Province	C											1	1				
	D												1				
Beheira	C														1	1	
Beni-Souef	C				12	79	14	3	4	4	11	3	5	6	1	1	1
	D				3	27	7		2			1	1	3			
Maghagha District	C				1												
	D				1												
Menufia	C					11											
	D					2											
Minieh Province	C				48	76	22	23	21	10	1	11		1			
	D				9	17	9	5	7	3	1	2					
Port Said	C													1	1		
Sidi Barani	C										10	1		1	10		
	D											7		1	1		
Suez	C	4	13	14	5	3											
	D	2	9		13	1											
Plague-infected rats				2													
Tanta	C					1					1			1	1	1	
	D					1											
Greece:																	
Corfu	C							1	14						1		
	D								3								
Patras	D											1		1		1	
Hawaii Territory: Hawaii:																	
Hamakua District—																	
Hamakua	D		1														
Plague-infected rats						1										1	
Honokaa—Plague-infected rats						1											
Kukuihaele	D															1	
Plague-infected rats													1				
Kukaiau—Plague-infected rats																3	
Paauilo	D													1		1	
India	C	12,652	23,174	26,079	18,518	3,272	127	79	90								
	D	8,521	16,998	20,907	17,074	3,183	143	77	74								
Bassein	D	8	12	22	13	3	12	1	1			1	2				
Bombay	C	14	33	69	43	39	8	3	3								
	D	9	33	61	69	38	5	1	2					1			
Calcutta	D	1		2													
Madras Presidency	C	452	271	62	21	12	4	6	29	15							
	D	256	212	48	12	6	1	2	15	7							
Rangoon	C	35	48	30	16	14	3	8	12	8	9	12					
	D	30	43	26	14	15	3	8	10	7	10	11	10	8			
Vizagapatam	D									1							

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

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	Week ended— June, 1928				July, 1928				August, 1928		
							9	16	23	30	7	14	21	28	4	11	18
Indo-China (see also table below).																	
Pnompenh	C										3		1				
	D										3		1				
Saigon	C							5									
	D							1									
Plague-infected rats								2									
Iraq:																	
Baghdad	C	4	2	5	11	13	8	2	3	1				1			
	D	2	2	5	6	3	1	1	1	1							
Plague-infected rats					4	3											
Dulaim Liwa	C	1			1												
Kwangchow-Wan (see table below).																	
Madagascar (see also table below):																	
Tamatave	C					1	1	6	5	8	3						
	D							4		4	3						
Nigeria (see also table below):																	
Lagos	C	10	8	7	17	28	11	10	14	8	15	14	14	10	14		
	D	11	8	6	18	28	10	10	14	8	15	14	14	9	15		
Plague-infected rats					8	55	10	27	12	8	23						
Paraguay: Asuncion	C							5									
	D							2			2						
Peru (see table below).																	
Portugal: Lisbon	C									1							
Senegal (see also table below):																	
Thies and vicinity	C			8		72	52										
	D			4		40	40										
Siam	C	20	42	33	27	15	1	3	2		3						
	D	12	36	30	13	11	2	2	3		2						
Ayudhaya	C						2				2						
	D						1				2						
Bangkok	C	2	1	1	4												
	D	2	1	1	2												
Nagara	C					1	2										
Straits Settlements: Singapore	C	1	3	1													
	D	1	2	1													

Syria (see also table below):																	
Beirut	C								1		2	1	1	1			
Tunisia: Bengardane region	C			8													
	D			6													
Turkey: Adalia	C													1			
Union of South Africa:																	
Cape Province	C	1															
	D	1															
Orange Free State	C	5	5	5													
	D	4	1	5													
Union of Socialist Soviet Republics: Astrakhan—Axary District	C							3									
	D							2									
Venezuela: State of Miranda—Tacata and Cua	C		P														
On vessel: S. S. Tymeric, at Barbados, from New Orleans	C					1											

Place		October–December, 1927	January–March, 1928	April, 1928	May, 1928	June, 1928	July, 1928
Algeria (see also table above):							
Algiers	C	2			1		
Angola	C	3					
British East Africa (see also table above):							
Kenya	C	62	65	17	11	58	
	D			5			
Ecuador: Guayaquil	C	18	20		1	5	
	D	5	8			2	
Plague-infected rats		31	75		1	4	
Indo-China (see also table above)	C	10	12	9	16		
Kwangchow-Wan	C		18	17	10		
Madagascar (see also table above)	C	692	940	95		104	
	D	605	864	90		94	
Ambositra Province	C	25	202	25	13		
	D	17	191	25	10		
Antisirabe Province	C	109	281	35	14	19	
	D	108	279	34	14	19	
Itasy Province	C	104	55	1			
	D	94	49	1			
Moramanga Province	C	95	56				
	D	83	55				
Tananarive Province	C	408	348	34	20	17	
	D	354	292	30	20	17	

Place		October–December, 1927	January–March, 1928	April, 1928	May, 1928	June, 1928	July, 1928
Nigeria (see also table above)	C	63	32				
	D	61	32				
Peru	C	34	93		20		
	D	11	23		4		
Callao	D	3					
Lima	C	7	6		4		
	D	3			2		
Senegal (see also table above)	C		30	81	216	151	
	D		17	40	115	91	
Rufisque	C				17	29	12
	D				9	22	5
Thies	C			30	72	243	103
	D			23	40	174	64
Tivaouane	C			51	105	169	84
	D			28	57	90	70
Syria: Beirut (see also table above)	C	2				1	4

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

PLAGUE RATS ON VESSELS

S. S. *Modemi* at Goteborg, Sweden, from Bahia and Buenos Aires via Cape Verde Islands, December 22, 1927.
S. S. *Gydevore* at Landskrona, Sweden, from Rosario via Canary Islands, January 22, 1928.
S. S. *Dryden* at Liverpool from La Plata River ports, January 20, 1928.
S. S. *Sicily* at Liverpool from Buenos Aires and Rosario, June 8, 1928, 7 plague-infected rats.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	Week ended— June, 1928				July, 1928				August, 1928		
							9	16	23	30	7	14	21	28	4	11	18
Algeria (see also table below)	C	71	72	3	12												
Algiers	C	15	10	5	4	5	1	7	4	3	1						
Oran	C	11	5	12	17	5		4									
Angola (see table below).																	
Arabia: Aden	C		1						1								
Brazil (see also table below):																	
Pernambuco	D					1											
Rio de Janeiro	C			1							1						
	D			1													
British East Africa (see also table below):																	
Kenya—Mombasa	C			2	1												
Tanganyiki	D	5															
British South Africa:																	
Northern Rhodesia	C	233	297	67	623	195	5	3	6	1							
	D	23	42	9	51	17	1										
Southern Rhodesia	C	3	7	7	24	13		13	4	19		1		19			
	D		1		10					4				4			
Canada:																	
Alberta	C	27	27	47	12	44	4	1	1	3			1	2	10		
Calgary	C			1													
Edmonton [1]	C	2	9	7	3							1	1				
British Columbia—Vancouver	C	26	10	17	24	11	1	2	1		3	2	2	4			
Manitoba	C	1			7	4	10							4			
Winnipeg	C	2															
New Brunswick	C		1			1		7							1	2	

Ontario	C	243	147	83	50	41	5	8	14	6			6	5	2		
Kingston	C	1			3								2				
Ottawa	C	68	22	26	4	6	1										
Toronto	C	20	14	9	11	12			3					1			
Quebec	C	26	54	112	83	78	21	14	14	32	21	16	12	13	5	9	
Montreal	C	8	9	9	9	3	3	2	3	3	3	1	1				
Quebec	C	16	13	10	23	47	17	11	10	14	21	9	7	7	4		
Sherbrooke	C			3				4									
Saskatchewan	C	97	22	33	52	28		4	3	9					4		
Moose Jaw	C	11	13	7	3	1					1						
Regina	C			3	8	1				1							
Saskatoon	C	15	2														
Ceylon: Colombo	C	4	6	1													
	D	1		1													
China:																	
Amoy	C		1	6	9	3											
Antung	C				3												
Canton	C		2	7	2	2											
Chefoo	C			P		P		P			P						
	D		1														
Foochow	C	P	P	P	P					P		P					
Hong Kong	C	2	7	32	25	30	9	2	2	1	3	3	1	4	6		
	D	2	4	19	26	23	12	3		4	2	2		1	5		
Manchuria—																	
Changchun	C	4			4	6								1			
Dairen	C	15	13	15	16	35	14	11	12	11	4	11	3	3			
	D	8	7	8			7	4	2	7	4	4	3	1			
Fushun	C						4	2				1					
	D											1					
Harbin	C	5	7	7	10	27	4	2	14	11							
Kwantung	C								14						1		
Mukden	C	4	21	1	4	3	1	3	1	1							
	D									1							
Pensihu	C						1										
	D						1										
Port Arthur	C											1			1		
South Manchuria Railway Zone	C								5								
Shanghai—																	
Foreigners only	C	5	6	7	3	11	4		3		1	1					
Including natives	D	11	19	9	9	19	2	6	3		6	4			1		
Tientsin	C	48	20	13	17	9	2	6	4	4							
Chosen (see table below).																	
Curacao (alastrim)	C	2	3														
Dominican Republic: Santo Domingo	C			2	1												
Dutch East Indies:																	
Balikpapan	C										7						
	D										2						
Belawan Deli	C								9	2		2		2			
	D								3			1					
Borneo—Pontianak	C		1														

[1] The reports of smallpox in Edmonton as published in preceding issues of the Public Health Reports were erroneous. A corrected report appears in the table this week.

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

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	Week ended— June, 1928				July, 1928				August, 1928		
							9	16	23	30	7	14	21	28	4	11	18
Dutch East Indies—Continued.																	
Java—																	
Batavia and West Java	C	4	2	5	1	2											
East Java and Madura	C	2	9		2			1	1								
	D		1		2												
Palembang	C											1					
Sumatra—Medan	C	23	14	7	2	10		2		2		2					
	D	11	2	5	3	5						1					
Ecuador (see table below).																	
Egypt	C	1	2	52	12	1											
	D			33	7	1											
Behera Province	C											1					
Cairo	C	1															
France (see table below).																	
Gold Coast (see table below).																	
Great Britain:																	
England and Wales	C	1,530	1,473	1,341	1,344	1,199	365	282	230	219	182	177	173	149			
Birmingham	C	44	3	1	1			2				1					
Bradford	C	24	12	19	14	17	6		3	1	2						
Bristol	C	3	4	12	17	10	1			1							
Cardiff	C			5	3	2											
Castleford	C		4	36	69	24	5	4		9	2	5	4	3	6		
Hull	C									1	1	20	3			6	
Leeds	C	3	9	14	1		3	4	1			1			1		
Liverpool	C		1														
London	C	4	14	17	42	25	49	24	11	12	4	3	9	3			
Manchester	C	25	8	14	8	5	1										
Newcastle-on-Tyne	C	27	12	9	4	12	3	2		1		28		3			
Nottingham	C	27	11	13	17	20	2	1			2	1					
Sheffield	C	8	6	1	14	4		1		1	1			1			
Stoke-on-Trent	C	1	15	12	32	24	4	2	7	1		3		2			
Weymouth	C											1					
Greece (see table below).																	
Hedjaz	C	35	115			6	3		11		8		5	5			
	D	23	46			2			1		1		2	3			

India	C	17,777	18,850	28,034	30,436	21,489	4,608	3,515	3,015								
	D	3,709	3,826	5,540	6,672	5,046	1,051	937	795								
Bassein	C	1			1												
Bombay	C	61	149	218	200	136	19	15	20	17	17	27	11	12			
	D	24	73	120	118	78	15	8	12	11	6	16	6	5			
Calcutta	C	58	71	134	171	130		22	23	16	19	15	11	7			
	D	34	50	104	130	101		16	20	14	13	10	8	4			
Karachi	C		1	1	2	3						2		1			
	D		1		1	1						1		1			
Madras	C	74	100	183	169	59	6	9	7	13	10	11	8	10			
	D	8	19	29	38	18	3	1	2	4	3	4	6	5			
Moulmein	C									1		2	2	5			
	D									1		1	1	4			
Negapatam	C	8	3		7	8		9	4	6		2	8	16			
	D	3			3	1	2	2	2	1		1	1	2			
Rangoon	C	275	377	320	167	36	5	3	5	17	2	1	4				
	D	64	104	102	79	13	2	1	1	2	1	1	1	1			
Tuticorin	C					3											
Vizagapatam	C	10	2	3	2	3	4	4				2	1				
	D	8				1			3			1	2				
India (French):																	
Chandernagor	C			5	5									1			
	D			1	1									1			
Pondicherry	C	47	9	18	36	32	6	3	2	2		3	5	4	4		
	D	47	9	18	36	23	6	3	2	2		3	5	4	4		
Indo-China (see also table below):																	
Saigon	C		3														
Iraq:																	
Baghdad	C	19	7	5	5	16	3	3	7	3	7	10	2	5		4	2
	D	11	4	4	3	6	1	1	7	1	3	6	2	4		1	1
Basra	C	1	7	5	4	3			1	1	6						
	D			2	2	3			1	1	2						
Italy:																	
Leghorn	C		1	1													
Palermo	C			5	10	6	4	6					4				
Rome and vicinity	C	3															
Ivory Coast (see table below).																	
Jamaica (outside Kingston) (alastrim)	C	5	10	13	4	2	1		2								
Japan:																	
Kobe	C					11											
Nagoya	C				6	2											
Osaka	C								2	2							
Tokyo City	C	4	4	15	8	2											
	D	1	2	1	1												
Tokyo prefecture (outside city)	C			24	1	1											
	D			1	2												
Yokohama	C				2	3											
	D					1											
Latvia (see table below).																	
Mauretania	C		P														

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

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	Week ended— June, 1928				July, 1928				August, 1928		
							9	16	23	30	7	14	21	28	4	11	18
Mexico (see also table below):																	
Acapulco	C					2											
	D					2											
Jalisco (State)	C		P	P	P												
Guadelajara	D		1	2	12	13	4	2	2	2	1	1	3	4	1	4	
Manzanillo	D			1													
Mazatlan	D					3	1	1									
Mexico City and surrounding territory	C	2	1		1	2					1	2					
	D						1										
Reynosa	C												1				
Saltillo	D					2	1		1								
Tampico	C		1														
Morocco (see table below).																	
Nigeria (see also table below):																	
Lagos	C			1							1						
Southern Provinces	C		7	93			44	7									
	D			35			12										
Palestine: Jerusalem	C	1															
	D	1															
Persia (see table below).																	
Poland	C	3	1	1	9	1	1	2									
	D				1												
Portugal (see also table below):																	
Lisbon	C	12	20	5	6	7	2		2	3	3	1	1	3			
	D		1														
Oporto	C				1												
Senegal (see also table below):																	
Dakar	C		34	29	16	29	4	4									
	D			20	8	7											
Siam	C	35	12	28	10	8		3			1						
	D	4	3	4	3	1		1									
Bangkok	C				1												
	D					1											
Spain (see also table below):																	
Valencia	C		1	2													

Straits Settlements: Singapore	C	1	1	1	3		1										
Sudan (Anglo-Egyptian)	C	85	100	332	160	168	22	18	93	73	32	63		49	31		78
	D	48	27	100	32	20	7	3	17	10	5	18		12	9		6
Sudan (French) (see table below).																	
Syria (see table below).																	
Taiwan: Keelung	C								1								
Tunisia: Tunis	C	3	14	4	6	3	1			1	5		1				
Union of South Africa:																	
Cape Province	C	P															
Natal	C	P	P	P													
Orange Free State	C	P		P		P	P	P									
Transvaal	C				P	P		P	P								
Union of Socialist Soviet Republics (see table below).																	
Upper Volta	C		5	2	9												
Venezuela: Maracaibo	C	1															
	D	1	1														
On vessel:																	
S. S. Arendskerk at Singapore, from Amoy, China	C			P													
S. S. Kashgar at Kobe, from Shanghai	C				P												
S. S. Rohna at Penang, from Negapatam	C					P											
S. S. Theseus, from Jeddah to Penang	C											1					
S. S. Tjileboct at Hong Kong, from Shanghai	C				P												
S. S. Yarmouth at Kingston, Jamaica, from Habana, Cuba	C			1													
S. S. Victoria at Nome, Alaska	C								8								

Place		October-December, 1927	January-March, 1928	April, 1928	May, 1928			June, 1928			July, 1928	
					1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20
Algeria (see also table above)	C	682										
Oran	C	11										
Indo-China (French) (see also table above)	C	97	426	35	36	6	37	47		36	8	3
Ivory Coast	C					7						4
Senegal (see also table above)	C			51			20	23	14	2		
	D			7			9					
Dakar	C			11	12	7	5	4	1	3		
	D			8	4	3						
Sudan (French)	C		15	4	30	P	P	20				17
	D				6							
Syria:												
Aleppo	C	1	1						1	2		
Beirut	C	2	75	9	2	3	2	1	7	2	4	1
	D		2	1								
Damascus	C	47	14									

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

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May, 1928	June, 1928
Angola	C	151	10	36	1			
	D							
Congo	C	77		36				
Cuanza-Norte	C				1			
Cuanza-Sul	C	9	10					
Zaire	C	5						
Brazil (see also table above):								
Porto Alegre	C	5		1				
British East Africa (see also table above):								
Zanzibar	C	2						
	D	1						
Chosen	C	4	4	21	23		152	
	D	1	2	8	6		38	
Seoul	C				1			
Ecuador: Guayaquil	C	6	2	9	24	19	31	11
	D				1			
France	C	25	11	10	13	6	15	21
Gold Coast	C	4		1	3			
Greece	C	9	6	11	19	1	22	31
	D			2	2		1	2
Latvia	C	2		1				
Mexico (see also table above)	D	346	256					
Morocco	C	622	55	47	30	19	25	10
Nigeria (see also table above)	C	316	275	317				
	D	81	39	45				
Persia	D	2	7					
Portugal (see also table above)	C		143	115			98	74
	D		22	8			9	3
Lisbon	C						8	
Spain (see also table above):								
Madrid	D	1						
Union of Socialist Soviet Republics:								
Railways, etc.	C	33	18	20				
Other territories in Europe	C	1,256		998				
Transcaucasus, Siberia, and Central Asia	C	81						
Ukraine	C	48	6	11				

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	Week ended— June, 1928				July, 1928				August, 1928		
							9	16	23	30	7	14	21	28	4	11	18
Algeria (see also table below):																	
Algiers	C	1	3	9	4	13	28	1	2	2	1		2				
	D		1		2		6										
Oran	C	2	10	4	11	4	5	1		1	2	6	6				
	D				1			1									
Austria: Vienna	C	1															
Bulgaria (see also table below):																	
Kustendil Department	C										2						
Sofia	C	1		20	1	20	3	10	1		1						
	D						2	3	1								
Chile:																	
Iquique	C													1			
	D												1				
Talcahuano	D			1													
Valparaiso	C		1					1					2				
	D						2	1									
China (see also table below):																	
Manchuria—																	
Dairen	C				10												
Harbin	C				2	16	7	9	4	3							
Kwantung	C							223	181			213					
South Manchuria Railway Zone	C							7	3			5					
Tientsin	C					2											
Chosen (see table below).																	
Czechoslovakia (see table below).																	
Egypt	C	9	17	2	3	11			7								
	D	2	8	1	1	2			3								
Alexandria	C											1					
Assiout Province	C						1			1	1	1					
Assouan Province	C						1			1							
Behera Province	C			29	32	43	3		3	1	2						
	D				7	7	2										
Cairo	C			2	4							1					
	D			1	4							1					
Dakalieh	C						1				1						
Gharbieh Province	C			23	14	5	2			2		1					
	D				5		1		1	1							

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

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	Week ended— June, 1928				July, 1928				August, 1928		
							9	16	23	30	7	14	21	28	4	11	18
Egypt—Continued.																	
Keneh Province	C			5	38				1								
	D				7				1								
Menoufieh Province	C				28	9	3		1	1							
	D				3	3	1		1								
Port Said	C											1	1			4	3
Suez	C											1	1				1
	D					1								2	1		
Great Britain: London County	C					1	1	1									
Greece: Piræus	C								1								
Hungary: Budapest	D								2					2			
Ireland:																	
Belfast	C					2	1										
	D						1										
Irish Free State	C	1			1	4											
Cork County	C				1												
Galway County—Oughterard	C													10			
Kerry County—Cahirciveen	C														1		
Japan (see table below):																	
Hiogo	C								1								
Yamagata	C					2		2									
Latvia (see table below).																	
Lithuania (see table below).																	
Mexico (see also table below):																	
Durango	D										1						
Guadalajara	D					1											
Mexico City, including municipalities in Federal District	C	5	8	12	8	19	4	3	5	2	6	2	1	1			
	D		4	3	1	2					2		1				
Monterey	D			1													
Morocco (see also table below)	C	1,051	316	748	591	280	40	44	55	75	40	50	49				
Palestine	C	5	10	7	6	4	2	1	3	2	1	3	3		2	3	3
Peru (see table below).																	
Poland	C	346	265	382	144	226	28	39	35	32	3	30	15				
	D	19	26	25	12	17		3	2	1	1		2				
Portugal (see also table below):																	
Oporto	C	1									1						

Rumania	C	39	68	141	142	99	36	21	18	5	8	8					
	D	9	5	11	12	8	6	4	1			1					
Syria (see also table below):																	
Aleppo	C							2									
Tunisia	C	4	1	18	19	7		4	3								
Union of South Africa:																	
Cape Province	C	1	P		P	P		P	P	P							
Natal	C	1	2		P	3		P		P							
Orange Free State	C	P			P	P		P	P	P							
Transvaal	C					1											
Union of Socialist Soviet Republics (see table below).																	
Yugoslavia (see table below).																	
On vessel S. S. Gaika at Durban, Natal, from Mauritius	C		1														

Place		1927		January, 1928	February, 1928	March, 1928			April, 1928			May, 1928			June 1-10, 1928
		July-September	October-December			1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	
Algeria (see also table above)	C	110	12												
	D	13	1												
Algiers	C	10	2												
Bulgaria (see also table above)	C	43	4	13	26							26			16
	D	3	2	1	5										2
Morocco (see also table above)	C	231	123												

Place		January, 1928	February, 1928	March, 1928	April, 1928	May, 1928	June, 1928	July, 1928
Chosen	C	183	400	313		241		
	D	19	44	25		32		
Chemulpo	C	1		1		2		
Gensan	C	1						
	D	1						
Seoul	C			10	28	18		
	D			1	2	4		
Czechoslovakia	C			25				
Greece: Athens	C	2	2		13	11	9	1
	D				2	2	1	
Japan	C					21		
Latvia	C		1	26	4	1		
Lithuania	C	86	137				10	8
	D	10	12					

Place		January, 1928	February, 1928	March, 1928	April, 1928	May, 1928	June, 1928	July, 1928
Mexico (see also table above)	D	46						
Peru:								
Arequipa	D	2			1			
La Oroya	C	P	P	P				
Turkey	C		17			7	2	2
	D		1			1		
Union of Socialist Soviet Republics:								
Railways, etc.	C	41	107					
Transcaucasus, Siberia, and Central Asia	C	7						
Ukraine	C	533	459					
Other territories in Europe	C		1,853					
Yugoslavia	C	7	24	3	10	19	16	
	D	3			1	3	1	

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

YELLOW FEVER

[C ndicates cases; D, deaths; P, present]

Place		Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	Week ended— June, 1928				July, 1928				August, 1928	
									9	16	23	30	7	14	21	28	4	11
Belgian Congo:																		
Boma	C		3															
	D		2															
Matadi	C		29	14	1		2	2										
	D		16	13														
Brazil:																		
Aracaju	D							2										
Bahia	C									1	3							
Estancia	C				1													
Pernambuco	C								1									
Rio de Janeiro	C							2	4	16	14	14	10	12	10	8	6	4
	D							2			6	9	5	7	9			
Sao Felix	C									P								
Dahomey: Grand Popo	C	1							1	2								
	D								1	1								
Gold Coast	C	1						2										
Ivory Coast	C		1								1							
	D		1								1							
Abidjan	C										1		1					
Ferkes-Sedougou	D																1	
Senegal: Dakar	C	7	2															
	D	7	2															