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MARINE HOSPITALS AND BENEFICIARIES OF THE PUBLIC HEALTH SERVICE

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THE MARINE HOSPITALS

Prior to 1798 there was no organized system of providing medical relief for American seamen, and such a need soon became apparent; for, as a result of travel to and from infected ports of the world, seamen frequently contracted strange maladies and upon arrival in other ports had no claims of citizenship on treatment facilities. Consequently they were a class apart, and there was need of special arrangements to prevent undue suffering. This need had been recognized by the mother country early in our colonial history. In 1692 Charles II began construction, in Greenwich, of the first building known to have been set apart by an English-speaking nation, and probably by any nation, exclusively as a hospital for seamen. Seamen of the American colonies were taxed to support this hospital. "Hospital money" was collected as early as 1729 in the amount of 6 pence per month from all British and colonial seamen sailing in and out of American ports.

The following letter to the Secretary of State from Evan Jones, Esq., dated New Orleans, August 10, 1801 (then under Spanish rule), is descriptive of the lack of treatment facilities for seamen in most parts of the world at the close of the eighteenth century:

A great number of American citizens, especially seamen and boatmen from the Ohio, die here yearly for want of a hospital, into which they might be put and taken care of, not that they are refused admittance into the Spanish Poor Hospital, but that building is by much too small for the purpose. No public house of any reputation will take them in, and consequently they lie in their ships or boats or get into wretched cabins, in which they die miserably, after frequently subjecting the humane among their countrymen to much trouble and expense. Would not this be an object, Sir, worthy of the attention of the Government of the United States? And might not a fund be easily established for the preservation of these poor people by imposing a light tax upon every vessel and boat that comes in, as well as upon every seaman and boatman?

About 200 vessels have entered here from sea during the 12 months past, and, allowing 8 men only to each, it makes 1,600. Perhaps 350 to 400 boats have come down from the Ohio, etc., during the same time, and, allowing four men to each, it would make about an equal number of men. A small sum from each, added to something from every vessel and boat would probably produce a capital equal to the exigency.

At the solicitation of the Boston Marine Society, several bills to provide medical relief for seamen were introduced early in the American Congress, and on July 16, 1798, the second President of the United States, John Adams, signed the act "for the relief of sick and disabled seamen" which established the United States Marine Hospital Service.

The first treatment furnished seamen by the Marine Hospital Service was given in Boston by Dr. Thomas Welch early in 1799. Dr. Welch assisted in caring for the wounded at the battles of Lexington and Concord, and during the Revolutionary War he was surgeon of the twenty-seventh Continental Regiment. He was appointed by President Adams as the first medical officer of the Marine Hospital Service and was in charge at Boston from 1798 to 1804.

The first marine hospital, located at Washington Point, Norfolk County, Va., was purchased from the State of Virginia in 1801; the deed transferring this property was signed by Gov. James Monroe on April 20th of that year. This old marine hospital was torn down in 1933, and there remains today nothing on the site to mark its former location. The second marine hospital was built on contract by the Marine Hospital Service at Boston in 1803 and occupied in 1804. A careful reader of the "Columbian Centinel" of October 30, 1802, would have noted the following announcement:

A MARINE HOSPITAL is to be erected by the United States in Charlestown, on the North Easterly part of the Land purchased to accommodate the Navy Yard * * *. In general, the Hospital is to be one hundred and fourteen feet long and thirty nine feet wide, to be built with brick, two stories high, and a well-stoned cellar under the whole. [Very complete details follow]. In order, therefore, to avoid any mistake or painful questions relative to this business, the plot of the building may be seen in the Collector's [Customs] office in Boston at all times * * *.

Dr. Charles Jarvis was the first physician in charge of the hospital, and upon his death in 1807, he was succeeded by Dr. Benjamin Waterhouse, an illustrious physician of his day, who introduced small-pox vaccination in this country. Dr. Waterhouse drew up the first set of rules and orders governing Marine Hospitals in April 1808. He was progressive and wished to make improvements in his station, as is evidenced by the following letter from Gen. Benjamin Lincoln, Collector of Customs, who had the "superintendence" of the hospital:

June 16, 1808: The physician of the hospital reports to me that he is in want of a building, I think about twenty feet square, two stories high, as a barn, in

which he can place his hay and straw, and a place in which he can stow away old bunks. Besides, he wants one small room wherein he can cleanse the people who are lousy, and who have the itch.

From 1798 to 1884 the Marine Hospital Service was supported in part by monthly contributions of money deducted from the wages of seamen. This deduction was at the rate of 20 cents per month per man from 1798 to 1870 and 40 cents per month from 1870 until 1884. From 1884 until 1905 the hospitals were supported in part by tonnage taxes. Since 1905 they have been supported entirely by annual appropriations made by Congress. At this point it is interesting to note that the United States Navy had no separate medical establishment prior to 1811, and sailors of the Navy contributed to the marine hospital fund in the same way as did the sailors from the merchant marine. Since 1906 the tonnage tax has been turned into the general income of the Government instead of being devoted to the specific purpose for which it was originally designed and used, but it still constitutes an important source of revenue, having yielded \$14,920,-618.35 between 1885 and 1906 and a larger amount, relatively, since that period, as shown by the accompanying table:

Fiscal year	Tonnage tax	Fiscal year	Tonnage tax
1907-----	\$1,044,781.13	1922-----	\$1,818,330.70
1908-----	1,076,571.69	1923-----	1,688,786.68
1909-----	1,052,374.37	1924-----	1,713,423.68
1910-----	1,081,526.70	1925-----	1,813,755.66
1911-----	1,083,255.34	1926-----	1,825,714.39
1912-----	1,156,010.75	1927-----	2,245,511.68
1913-----	1,273,789.43	1928-----	1,939,289.96
1914-----	1,310,759.03	1929-----	2,044,438.05
1915-----	1,315,425.30	1930-----	2,021,255.94
1916-----	1,454,565.83	1931-----	1,777,622.54
1917-----	1,393,743.16	1932-----	1,601,224.43
1918-----	1,171,418.36	1933-----	1,418,771.87
1919-----	1,265,229.23	1934-----	1,483,161.11
1920-----	1,707,934.44	1935-----	1,452,257.50
1921-----	2,191,895.85		

There still lingers in the minds of many, especially of old sailors, a belief that the Government possesses a large sum of marine hospital money; but between 1798 and 1884 the seamen's contributions amounted to \$15,794,807.63, while the total expenditures made for hospital purposes amounted to \$19,622,371.87; the difference was made up by Congressional appropriations.

The fathers of the Constitution, having little conception of public health aid as a fundamental responsibility of the Government, did not enumerate it specifically as one of the functions of the Federal Government, and so the Public Health Service had its origin in the Marine Hospital Service, the original and sole function of which, as indicated by its name, was to provide hospital service and medical treatment for sailors of the merchant marine (and until 1811 to sailors of the Navy), then one of the most important industries of the young

Nation. As time passed, the new country developed and medical science made truly remarkable discoveries in epidemiology, preventive medicine, and sanitation. It was quite natural that additional duties of a public health nature were gradually imposed upon the Marine Hospital Service, and in keeping with these new duties the words "Public Health Service" were added to its official name. For about 10 years, then, it was known as the "United States Public Health and Marine Hospital Service." In 1912 its name was again changed to one more suitable to its expanded character and the development of public health science, and it became the United States Public Health Service. However, this change in name was not made because it ceased to operate the marine hospitals, nor because that function decreased. On the contrary, the number of seamen patients

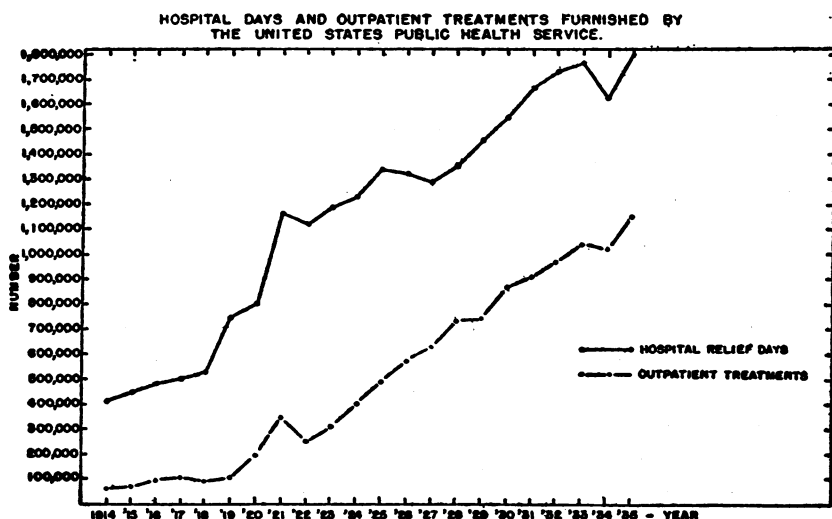


FIGURE 1.—Some of the increase in service shown in this chart is the result of increase in the number of beneficiaries in certain groups, such as merchant seamen, Coast Guard personnel, and Civil Service employees, and some is due to additional classes of beneficiaries authorized by Congress from time to time. (For 3 years, 1919-22, before the Veterans' Bureau was organized in 1922, the Public Health Service bore the heavy emergency responsibility of providing hospital care and treatment for veterans of the World War. These beneficiaries are not included in the figures represented by the graphs in the chart.)

and the number of marine hospitals continued to increase, and from time to time Congress authorized the construction of additional marine hospitals and treatment in these hospitals of persons other than seamen.

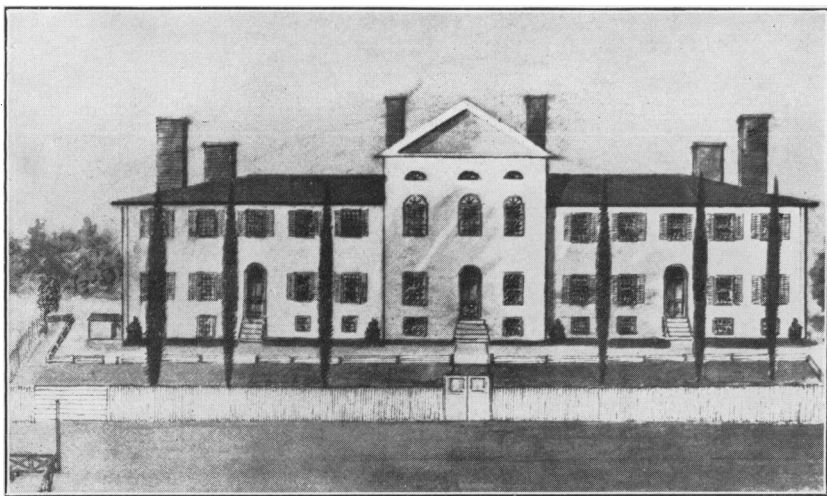
At present there are 26 marine hospitals, including two specialized institutions—a leprosarium at Carville, La., and the tuberculosis sanatorium at Fort Stanton, N. Mex. The other marine hospitals are located in Baltimore, Md.; Boston, Mass.; Buffalo, N. Y.; Chicago, Ill.; Cleveland, Ohio; Detroit, Mich.; Ellis Island, N. Y.; Evansville, Ind.; Galveston, Tex.; Key West, Fla.; Louisville, Ky.; Memphis,



OLD MARINE HOSPITAL AT NORFOLK, VA., THE FIRST MARINE HOSPITAL OWNED BY THE MARINE HOSPITAL SERVICE, PURCHASED FROM THE STATE OF VIRGINIA IN 1801.



NEW MARINE HOSPITAL AT NORFOLK, VA., OCCUPIED ON FEBRUARY 15, 1934.



FIRST MARINE HOSPITAL BUILT BY THE MARINE HOSPITAL SERVICE, AT BOSTON, MASS., COMPLETED IN 1803 AND OCCUPIED IN 1804.



MARINE HOSPITAL AT SEATTLE, WASH., OCCUPIED ON FEBRUARY 1, 1933.

Tenn.; Mobile, Ala.; New Orleans, La.; New York City; Norfolk, Va.; Pittsburgh, Pa.; Portland, Maine; St. Louis, Mo.; San Francisco, Calif.; Savannah, Ga.; Seattle, Wash.; Stapleton, N. Y.; and Vineyard Haven, Mass.

These hospitals have a total of approximately 6,000 beds and 278 physicians, 59 dentists, 522 nurses, 146 technicians, and 268 consulting specialists, while 2,034 other persons are required to provide the modern scientific medical, surgical, dental, and nursing care to which marine hospital beneficiaries are entitled. In addition to these hospitals, the Public Health Service also operates 126 outpatient offices, or contract hospital facilities, in which 36 full-time and 110 part-time physicians and 51 full-time and part-time employees are on duty.

BENEFICIARIES OF THE PUBLIC HEALTH SERVICE

The medical relief beneficiaries of the Public Health Service are as follows:

1. Merchant seamen (act of July 16, 1798).
2. Officers and enlisted men, active and retired, of the United States Coast Guard (acts of Aug. 4, 1894, June 24, 1914, Mar. 3, 1919, and May 18, 1928).
3. Officers and seamen on vessels of the United States Coast and Geodetic Survey (act of Mar. 3, 1919).
4. Officers and crews of vessels, certain keepers and assistant keepers of the Lighthouse Service, active and retired (acts of Aug. 28, 1916, Mar. 3, 1919, and June 24, 1930).
5. Officers and crews of vessels of the Bureau of Fisheries (acts of July 1, 1918, and Mar. 3, 1919).
6. Seamen (not enlisted in U. S. Army) from vessels of the Army Engineer Corps, Army transports, and other vessels of the United States Army (act of Mar. 3, 1919).
7. Seamen on vessels of the Mississippi River Commission (act of Mar. 3, 1919).
8. Seamen (not entitled or commissioned in the Military or Naval Establishments) employed on vessels of the United States Government (other than those of the Panama Canal) of more than 5 tons' burden and on State school ships (act of Mar. 21, 1936).
9. Cadets on State school ships (act of Mar. 21, 1936).
10. Aliens detained in hospitals of the Public Health Service under the immigration laws and regulations (act of Dec. 26, 1920).
11. Beneficiaries of the Employees' Compensation Commission (acts of Sept. 7, 1916, Mar. 3, 1919, Feb. 15, 1934, and Apr. 8, 1935).
12. Lepers (act of Feb. 3, 1917).
13. Officers of the Public Health Service and those employees of the Public Health Service on field duty (acts of June 23, 1913, Sept. 7, 1916, Mar. 3, 1919, and Apr. 9, 1930).

14. Officers and employees of the Public Health Service at national quarantine stations, on board quarantine vessels, and at foreign ports (act of Mar. 3, 1931).

15. Persons eligible for treatment or confinement in a United States narcotic farm (act of Jan. 19, 1929).

16. Federal prisoners confined in public institutions under the control of the Department of Justice (act of May 13, 1930).

17. Pay patients:

(1) Foreign seamen (acts of May 2, 1802, and Mar. 3, 1875).

(2) Patients of the Veterans' Administration (act of Mar. 3, 1919).

(3) Officers and enlisted men of the United States Army (Executive order of Apr. 3, 1917, and act of Mar. 3, 1919).

(4) Officers and enlisted men of the United States Navy (act of Mar. 3, 1875, Executive order of Apr. 3, 1917, and act of Mar. 3, 1919).

(5) Enrollees in the Civilian Conservation Corps (act of Mar. 31, 1933).

18. Patients with diseases affecting the public health, subject to special study (act of June 5, 1920).

Merchant seamen.—For the purposes of determining eligibility to treatment, the term "merchant seaman" is defined as "any person employed on board in the care, preservation, or navigation of any registered, licensed, or enrolled vessel of the United States or in the service, on board, of those engaged in such care, preservation, or navigation." Temporary medical relief only is contemplated, and seamen are entitled to treatment only during their service as seamen and for a brief period thereafter; but a seaman once under treatment may continue in the treatment status until he has received the maximum benefit to be expected from hospital or out-patient care. However, a seaman will not be admitted to hospital or out-patient care (except under special circumstances) when more than 60 days have elapsed since his last day of service on a vessel or if he has of his own volition discontinued his occupation as a seaman. Since American ships have always roamed the seven seas, practically every known disease is met with at some time or other in the wards of marine hospitals. Seamen constitute about 60 percent of all marine hospital patients; and adequate treatment of this class of patients, gathered from all parts of the world and afflicted with all the diseases of mankind, requires thoroughly trained and widely experienced physicians representing all the specialties of modern medicine and surgery. This work affords exceptional opportunities for young physicians to see tropical and other important diseases not commonly seen in continental United States.

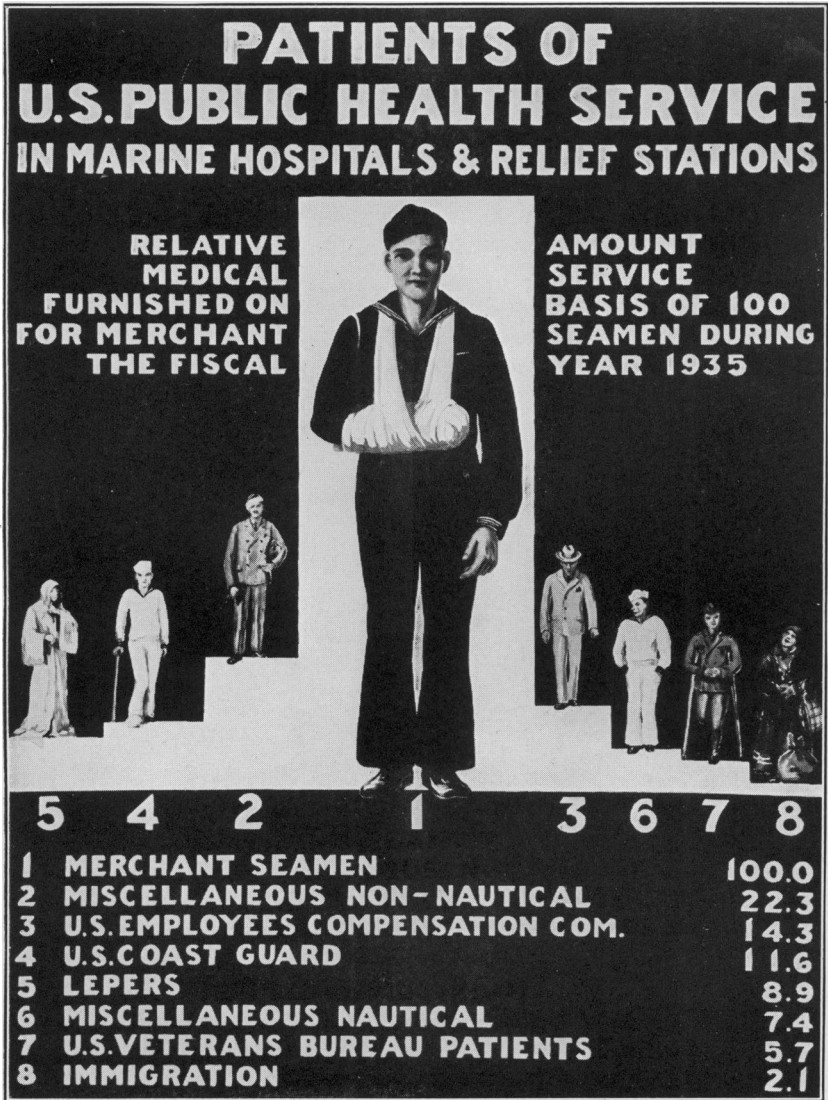


FIGURE 2.—Graphic representation of the relative amounts of medical service furnished different groups of beneficiaries.

In the year ended June 30, 1935, 1,145,469 days of hospital relief and 593,554 out-patient treatments were furnished seamen by the Public Health Service.

United States Coast Guard.—The Public Health Service functions as the medical department for the Coast Guard. The primary duties of the Coast Guard are the prevention of smuggling and the saving of life at sea. To accomplish this the Coast Guard had, on June 30, 1935, an officer and enlisted personnel numbering about 11,000, stationed on seagoing cutters, patrol boats, airplanes, and at life-saving stations along the coasts. The officers and crews of these important vessels and stations must be kept as hardy and healthy as possible. The responsibility of the Public Health Service in this connection begins with the entrance examination of candidates who seek admission to the Coast Guard and continues throughout the active and retired life of the Coast Guardsmen. For recruiting, promotion, and retirement purposes about 18,000 complete physical examinations are made annually for the Coast Guard and there are approximately 4,000 hospital admissions per year. In addition to the medical officers who serve the Coast Guard in hospitals, 20 medical officers and 5 dental officers are detailed to duty on board Coast Guard vessels and at shore stations, including the Coast Guard Academy.

Civil Employees of the United States Government.—Civil employees of the United States Government injured in the performance of duty and those contracting occupational diseases are entitled to all necessary medical relief in Government institutions when suitable facilities are available. In addition to the medical relief the Public Health Service affords beneficiaries of the United States Employees' Compensation Commission, this service also appoints officers, when requested by the commission, to act as medical advisers and referees for the commission.

Two important new groups of beneficiaries have recently been added to the beneficiaries of the commission in the personnel employed by the Civil Works Administration and the Works Progress Administration. Members of these groups are entitled to medical relief only when they suffer traumatic injuries incurred in performance of duty.

Coast and Geodetic Survey.—Officers and seamen serving on board the 30 vessels of this branch of the Federal Government are entitled to medical relief by the Public Health Service, with certain minor differences, in the same manner as are merchant seamen.

United States Lighthouse Service.—The personnel manning lighthouse vessels are entitled to marine hospital treatment under regulations similar to those affecting merchant seamen. The Public Health Service provides medical supplies to lighthouse vessels, a provision

not made to any other vessels except those of the Coast Guard. By special act of the Congress, certain lighthouse keepers who pass a prescribed physical examination upon entering that service are eligible to treatment by the Public Health Service.

Bureau of Fisheries.—The officers and crews of the 20 vessels of the Bureau of Fisheries are entitled to medical treatment under the same conditions as those applying to merchant seamen.

United States Immigration Service.—Immigration laws direct the mandatory exclusion of aliens from the United States for a number of specified conditions, among which are certain mental and physical conditions such as idiocy, imbecility, feeble-mindedness, epilepsy, insanity, mental defectiveness, constitutional psychopathic inferiority, chronic alcoholism, and tuberculosis in any form. Exclusion is also mandatory for those afflicted with any of the following-named loathsome or dangerous contagious diseases: Favus; ringworm of the scalp, nails, or beard; actinomycosis; blastomycosis; mycetoma; leprosy; yaws; syphilis; gonorrhea; soft chancre; trachoma; amebiasis; leishmaniasis; trypanosomiasis; filariasis; schistosomiasis; paragonomiasis. As a reliable examination and past history are in most cases unavailable for the examining medical officer, the detection of these diseases is often an extremely difficult matter and requires the services of experienced physicians. This fact was recognized in the immigration laws, as is shown in the following extract from the law:

That the physical and mental examination of all arriving aliens shall be made by medical officers of the U. S. Public Health Service who shall have had at least two years' experience in the practice of their profession since receiving the degree of doctor of medicine * * *

As the correct diagnosis of such conditions is of paramount importance, the hospitals of the Public Health Service are used for diagnostic purposes and also for treatment of detained aliens. During late years much of the work of examining immigrants has been performed by officers of the Public Health Service detailed to serve as medical advisers to the American consuls in foreign ports. This has resulted in a great decrease in the number of arriving aliens who would otherwise make a trip to our country only to be detained and deported.

Civilian seamen, United States Army vessels.—The civilian officers and crews of the vessels of the United States Engineer Corps, Army Transport Service, and other vessels of the United States Army are entitled to treatment at marine hospitals and relief stations under the same conditions as are merchant seamen. In some of the marine hospitals located on the rivers, the crews of vessels of the Engineer Corps furnish from 25 to 35 percent of patients hospitalized. The civilian crews of Federal Government vessels are also entitled to the benefits provided by the United States Employees' Compensation Act, and those who are veterans are entitled to treatment under three

different classifications, namely, as veterans, as seamen, United States Engineer Corps, and as Federal employees under the United States Employees' Compensation Commission.

Other civilian seamen on United States Government vessels and cadets on State school ships.—Prior to March 21, 1936, there were a few seamen serving on Government-owned vessels who had never been included among the medical relief beneficiaries of the Public Health Service. These, together with the cadets acquiring nautical knowledge on State-owned school ships, were made beneficiaries by the act of March 21, 1936.

Seamen, vessels of the Mississippi River Commission.—Officers and men from the various vessels and other floating equipment of the Mississippi River Commission are entitled to treatment under the same regulations as apply to merchant seamen.

Lepers.—Notwithstanding the fact that leprosy is one of the most dreaded and dreadful of all diseases, and that its existence has been known and feared for many years and has attracted attention in the United States since the beginning of the last century, it was not until February 3, 1917, that the Federal Government made provision for the apprehension, detention, and treatment of those unfortunate persons afflicted with this disease. Although the act of Congress providing for the care of lepers was passed in 1917, owing to the reluctance of citizens to have lepers in their communities it was not until 1921 that the Public Health Service was able to secure a site for its leprosarium, and in that year the leper colony at Carville was purchased from the State of Louisiana.

The leper population of the colony is about 400. Any leper resident in the United States, except aliens subject to deportation, who presents himself, or who may be apprehended under the United States quarantine acts or duly consigned to the leprosarium by competent State health authorities, is received for detention and treatment under appropriate regulations. This hospital is serving a useful purpose in caring for these unfortunates who have been social outcasts from time immemorial. Patients at the leprosarium receive all the necessities of life and many of the comforts and luxuries. They receive the benefit of modern scientific treatment, which apparently arrests some cases, markedly improves many, and ameliorates the distress and pain of nearly all to a greater or lesser degree. There is always the hope that the opportunity to study the disease, afforded by a large number of cases in a modern hospital, may result in the discovery of a reliable cure.

Personnel of the Public Health Service.—Strange as it may seem, there was no legal provision for the Public Health Service to treat

its own personnel until 1913, when authority was granted for treatment for those officers and employees on full-time duty in the field.

The act of March 3, 1931, made officers and employees on duty at any national quarantine station or on a national quarantine vessel or detailed for duty in foreign ports under the quarantine act of 1893, full beneficiaries and entitled to all necessary medical treatment and other benefits authorized to be furnished to beneficiaries.

Narcotic-drug addicts.—A significant change in Federal policy toward the problem of drug addiction occurred in 1929, when Congress authorized two institutions for the segregation and confinement of prisoners addicted to the use of habit-forming narcotic drugs who have committed offenses against the United States and of addicts who voluntarily submit themselves for treatment. The objects, purposes, and designs of these institutions are to rehabilitate, restore to health, and train to be self-supporting and self-reliant those who are admitted.

Federal prisoners.—An act of the Seventy-first Congress, second session, approved by the President on May 13, 1930, authorized the Public Health Service to supervise and furnish the medical, psychiatric, and other technical and scientific services to the Federal penal and correctional institutions—a distinct departure from the former policy of having an individual medical organization for each prison.

Pay patients.—Foreign seamen—that is, seamen from foreign vessels—personnel of the United States Army and Navy, beneficiaries of the United States Veterans' Administration, and members of the Civilian Conservation Corps are treated in marine hospitals as pay patients at rates approved annually by the President of the United States.

Persons entitled to vaccination against smallpox and typhoid fever.—Federal employees engaged in interstate travel are, by departmental orders, entitled to these vaccinations.

Persons entitled to physical examination only.—More than 100,000 physical examinations are made each year by officers of the Public Health Service for other agencies of the Government which require special written examination reports on persons in whom they are interested in various ways. These examinations do not include the more numerous physical examinations relating to treatment of patients, although some beneficiaries who are entitled to treatment are included in the following classes:

Pilots, masters, mates, and engineers.—The Bureau of Navigation and Steamboat Inspection, Department of Commerce, requires all applicants for license to pass a satisfactory test for visual acuity, color vision, and physical fitness, which are important factors of safety in the navigation of ships. More than 6,000 applicants are

so examined annually, of whom between 3 and 4 percent are found to have defective color vision and, hence, are incapable of distinguishing the common color 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.

Able-bodied seamen.—The seamen's act of 1915 requires that 65 percent 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 are rejected for defective vision and color vision, diseases of the heart, venereal diseases, and other physical defects.

Food handlers.—Physical examinations of food handlers are not so valuable as was formerly thought, principally for the reason that a person may become capable of transmitting infection shortly after he has passed a perfect physical examination and the person in question, as well as his supervisor, may be lulled into a false sense of security by reason of the recent findings of the examination; but as an aid in the enforcement of interstate quarantine laws, which require exclusion from employment on common carriers of food handlers who may be carriers of communicable disease, medical officers of the Public Health Service will examine cooks, waiters, and other food handlers upon request of the agents of common carriers engaged in interstate commerce, including vessels of the United States.

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 the private physician of the applicant. Upon 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 a physical-examination report made by a Public Health Service officer before an employee enters on governmental duty are obvious. A confidential record is made of conditions that might later cause disability, and these records are useful not only in the matter of 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 a communicable disease.—

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 in which he constitutes a health hazard that cannot 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. At the discretion of the Bureau of Pensions, these examinations may also 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.

The accompanying table is a condensed history of the activities of the marine hospitals and other relief stations during the fiscal year 1935, but does not include the activities in Federal penal institutions nor those carried on at the United States Narcotic Farm, Lexington, Ky.

Classes of beneficiaries and amount and character of services rendered during the year ended June 30, 1935

Class of beneficiary	Hospital days		Out-patient treatments		Physical examinations (not related to treatment)		Remarks
	Number	Percent of total	Number	Percent of total	Number	Percent of total	
American merchant seamen.....	1, 145, 460	63.58	593, 554	51.57	8, 955	10.15	Communicable diseases are reported to local health officers.
Veterans.....	81, 322	4.51	1, 247	.11	788	.89	Patients of the Veterans' Administration.
Lepers.....	130, 136	7.22	6	-----	13	.01	National Leper Home, Carville, La.
Coast Guard personnel.....	80, 195	4.45	151, 744	13.18	8, 966	10.16	All medical services and supplies, ashore and afloat.
Injured Federal employees.....	108, 700	6.03	118, 473	10.29	25, 469	29.99	Patients of the Employees' Compensation Commission.
Immigrants.....	25, 062	1.39	10, 334	.89	337	.38	Patients of the Bureau of Immigration.
Seamen, Engineer Corps and Army Transport Service.....	48, 075	2.67	22, 134	1.92	667	.76	Civilian employees on Army vessels.
Seamen from foreign vessels.....	6, 479	.36	873	.06	126	.14	Pay patients.
Seamen and keepers, Lighthouse Service.....	13, 966	.78	6, 054	.53	142	.16	Medical supplies also furnished to lighthouse vessels.
Civilian Conservation Corps.....	103, 638	5.75	1, 903	.17	443	.50	Patients of the Civilian Conservation Corps.
Civil Works Administration.....	35, 598	1.98	12, 055	1.05	1, 554	1.76	Patients of the Civil Works Administration.
Alaska cannery workers leaving United States.....	-----	-----	1, 070	.09	4, 609	5.22	Vaccinations and other preventive measures.
Pilots and other licensees.....	-----	-----	-----	-----	7, 511	8.51	For the Steamboat Inspection Service.
Civil service applicants and employees.....	-----	-----	-----	-----	20, 447	23.16	For the Civil Service Commission.
Shipping Board.....	-----	-----	-----	-----	1, 461	1.66	To determine fitness for sea duty.
All others entitled to treatment.....	23, 128	1.28	231, 534	20.12	5, 779	6.55	From Bureau of Fisheries, Army, Navy, Mississippi River Commission, Coast and Geodetic Survey, etc.
Total.....	1, 801, 768	100.00	1, 150, 981	100.00	58, 267	100.00	

ACUTE RESPONSE OF GUINEA PIGS TO VAPORS OF SOME NEW COMMERCIAL ORGANIC COMPOUNDS

XL SECONDARY AMYL ACETATE¹

By F. A. PATTY,² W. P. YANT,³ and H. H. SCHRENK⁴

This report on the acute response of guinea pigs to secondary amyl acetate ((CH₃CH₂CH₂) CH₃.CHO.COCH₃) vapor in air is the eleventh of a series of similar reports (1) which deal with studies pertinent to establishing a criterion of the toxicity of some chemical products which have recently become commercially available for

¹ Contribution from the Pittsburgh Experiment Station, U. S. Bureau of Mines, Pittsburgh, Pa. Published by permission of the Director, U. S. Bureau of Mines. Work on manuscript completed June 24, 1935.

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industrial application. This investigation was undertaken at the request of Stanco, Inc., and was conducted jointly by the United States Bureau of Mines and that company at the Pittsburgh Experiment Station of the Bureau of Mines.

SCOPE OF WORK

The work included a study of the toxicity and physiological response of guinea pigs exposed to vapors of secondary amyl acetate. Only acute effects as produced by a single exposure were studied. The experiments were planned to cover a range of concentrations and periods of exposure which produce but slight or no response, moderate response, and serious response.

CHEMICAL AND PHYSICAL PROPERTIES

The secondary amyl acetate ($(\text{CH}_3\text{CH}_2\text{CH}_2)_2\text{CH}\cdot\text{CHO}\cdot\text{COCH}_3$) used in this study was a commercial grade sold for industrial use. It was a light, clear amber in color and had a pleasant ethereal odor in very dilute concentrations, but in the concentrations studied the odor was pungent, nauseating, and disagreeable. A determination of the specific gravity and boiling range of the material gave the following results:

Specific gravity

15. 6°/15.6°C.....	0. 8686
20°/15. 6°C.....	0. 8645

Boiling range

Distillate, cumulative (percent)	Temp. ° C., corrected to 760 mm	Distillate, cumulative (percent)	Temp. ° C., corrected to 760 mm
Initial boiling point.....	125. 0	50.....	133. 6
1.....	126. 5	60.....	134. 0
2.....	127. 5	70.....	134. 5
3.....	129. 0	80.....	135. 0
4.....	129. 4	90.....	136. 1
5.....	129. 8	95.....	137. 5
10.....	131. 3	97.....	139. 1
15.....	131. 7	98.....	140. 9
20.....	132. 0	99.....	143. 1
30.....	132. 7	99. 5.....	146. 2
40.....	133. 1	99. 9.....	149. 2

Recovery 99.9 percent; residue 0.1 percent.

These values agree closely with the specifications furnished by the manufacturer, who also specified that the color of the material was 30+ (Saybolt), free acid 0.006 percent, and that it was prepared from methyl propyl alcohol.

One group of guinea pigs was exposed to a more refined sample of secondary amyl acetate which had a boiling range of 132° to 134.5° C.

The boiling point of the secondary amyl acetate as given in Beilstein (2) is 133.5° C.

Secondary amyl acetate is an organic solvent used widely in the preparation of lacquers. It was not used commercially until about 1930, when it was made available at a reasonable cost. This amyl acetate should not be confused with *n*-amyl acetate or iso-amyl acetate, which have been in use for many years.

TEST APPARATUS

The apparatus used for preparing secondary amyl acetate vapor-air mixtures and for exposing animals was the same as that described in a previous report dealing with butanone (1).

COMPUTATION AND ANALYSIS OF VAPOR-AIR MIXTURES

The method of computation of vapor-air mixtures from the amount of the liquid volatilized in a known quantity of air was the same as that described in the report on butanone (1). For direct chemical determination a sample of the chamber air was taken by partly evacuating a bottle (4 to 20 liters, depending on vapor concentration) and replacing the partial vacuum with the air to be examined. The volume of the vapor-air mixture was computed from the volume of the bottle and the differential manometer readings. From 10 to 50 cc of 95 percent alcohol was admitted to the bottle, the bottle was shaken to facilitate absorption of the secondary amyl acetate, and the solution was washed into an Erlenmeyer flask with additional alcohol. A measured volume of at least 50 percent excess standardized N/10 sodium hydroxide was added and the solution was refluxed one-half hour to hydrolyze the acetate. The excess sodium hydroxide was titrated with N/10 sulphuric acid, using phenolphthalein as an indicator. Table 1 gives the results of analysis of a standard solution of secondary amyl acetate in alcohol.

TABLE 1.—*Results of analysis of portions of a standard alcoholic solution of commercial secondary amyl acetate and a refined sample*

Secondary amyl acetate taken, milligrams	Secondary amyl acetate found, milligrams	Recovery, percent
Commercial		
100.....	86.7.....	86.7
200.....	173.2.....	86.6
300.....	172.0.....	86.0 (Average 87.0.)
400.....	264.0.....	88.0
500.....	263.5.....	87.8
Refined		
100.....	89.2.....	89.2
100.....	89.8.....	89.8
200.....	182.5.....	91.2 (Average 90.0.)
300.....	178.4.....	89.2
500.....	454.0.....	90.8

The average recovery for the commercial sample was 87 percent and for the refined sample 90 percent. The values obtained for the amount of secondary amyl acetate in the vapor-air mixtures used in the animal exposures (table 2) were corrected by multiplying the determined value for the commercial product by 100/87, or 115, and the refined by 100/90, or 111.

Table 2 gives the values for the concentrations as computed from the volume of air and amount of secondary amyl acetate vaporized, and the concentrations found by chemical analysis of vapor-air mixtures used in animal experiments. The calculation of the percent by volume was made on the basis that one gram molecular weight of secondary amyl acetate is equivalent to 22.4 liters of vapor at 0° C. and 760 mm mercury pressure.

TABLE 2.—*Results of analysis of atmospheres used for exposing animals **

Concentration by—		Concentration by—	
Computation	Analysis	Computation	Analysis
(b)-----	0.95	(c)-----	0.91
(b)-----	.94	(c)-----	.91
(b)-----	1.00	0.49-----	.48
(b)-----	1.01	0.49-----	.51
(b)-----	1.00	0.48-----	.51
(b)-----	1.05	0.50-----	.49
(b)-----	^d 1.07	0.22-----	.20
(c)-----	.94	0.22-----	.20
(c)-----	.93	0.22-----	.21

* Concentration in percent by volume at 25° C. and 760 mm pressure. To convert to mg per liter, multiply by 53.2.

^b Concentration obtained by recirculating air in a closed chamber at 30° C. and 740 mm pressure across wicks wet with commercial secondary amyl acetate. No computed concentration.

^c Same as (b) except refined secondary amyl acetate.

^d Obtained by adsorption on air-equilibrated charcoal.

The maximum concentration attainable by recirculating air at 30° C. and 740 mm pressure over large surface wicks wet with commercial secondary amyl acetate in a closed chamber averaged approximately 1.0 percent. Under similar conditions, but with a temperature of 25° C., the refined product gave a concentration of 0.92 percent. This was the only concentration of refined secondary amyl acetate studied. The remainder of the results in table 2 represent experimental atmospheres prepared by continuously volatilizing a measured amount of the commercial secondary amyl acetate in a measured volume of air sufficient to give two to three air changes per hour in the experimental chamber. Tests have shown that this rate of change in the apparatus used is ample to prevent oxygen deficiency or significant increase in carbon dioxide. The general order of concentrations used in the experiments was 1.0, 0.50, and 0.20 percent by volume.

TEST PROCEDURE; DESCRIPTION AND CARE OF ANIMALS

The test procedure and description and care of animals were the same as described in the report on butanone (1).

RESULTS OF TESTS

This report presents summarized results pertinent to signs or objective symptoms, fatality, and gross pathology.

OBJECTIVE SYMPTOMS

Control animals.—No signs or symptoms were exhibited by the 18 control guinea pigs taken at random from the stock animals used in these experiments. No deaths occurred.

Exposed animals.—The signs or symptoms exhibited by animals exposed to secondary amyl acetate vapor in the order of their occurrence were as follows: Irritation of the nose and eyes, manifested by rubbing nose with forepaws and squinting; lacrimation; incoordination; narcosis; slow, shallow respiration; and death. Table 3 gives the average time necessary to produce the symptoms by various concentrations of secondary amyl acetate vapor in air. The figures given indicate the average time for the occurrence of the sign or symptom, excepting those in parentheses, which indicate that the particular sign or symptom did not occur in the maximum period of exposure as given.

TABLE 3.—*Signs and symptoms produced in guinea pigs exposed to vapors of secondary amyl acetate*

Type of symptom	Concentration of vapor in percent by volume			
	1.0	0.92 *	0.50	0.20
	Duration of exposure, minutes			
Nasal irritation (rubbing nose).....	(^b)	(^b)	1	1
Eye irritation (squinting).....	(^b)	(^b)	1	1-30
Lacrimation.....	1	1	5	* (810)
Incoordination.....	4	6	90	* (810)
Narcosis (unconsciousness).....	20	20	300-540	* (810)
Slow, shallow, nearly imperceptible respiration.....	165	180	720	* (810)
Death.....	300	435	* (810)	* (810)

* Refined secondary amyl acetate; all other concentrations were prepared with commercial secondary amyl acetate.

^a Occurred almost immediately after start of exposure.

^b Not observed in the maximum exposure time given in parentheses.

With the exception of nasal and eye irritation, no abnormal signs were observed during or following an exposure to 0.2 percent secondary amyl acetate vapor in air by volume for 810 minutes. With exposure to 0.5 percent in air, signs of irritation of the nose and eyes

occurred in 1 minute, lacrimation in 5 minutes, incoordination in 90 minutes, narcosis in 300–540 minutes, but no deaths occurred during or following an exposure of 810 minutes. The time for the occurrence of these symptoms decreased rapidly with increases in concentration, and death was produced by an exposure to 1.0 percent vapor in air for 300 minutes; a concentration of 0.92 percent of the refined secondary amyl acetate caused death in 435 minutes.

GROSS PATHOLOGY

Control animals.—The 18 control animals killed for autopsy exhibited no significant gross pathology.

Exposed animals.—The gross pathological findings in animals that died during exposure (see fig. 1 and table 3) were slight congestion

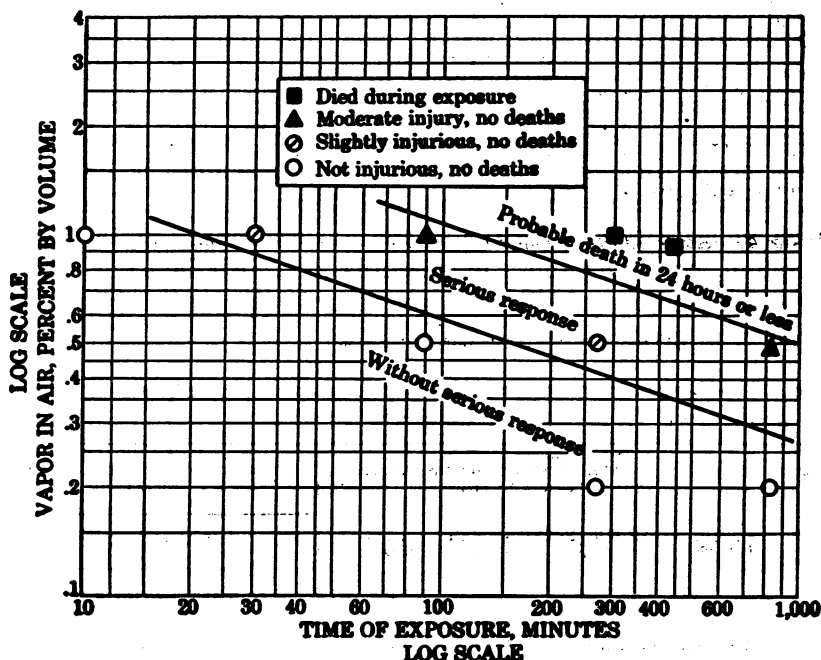


FIGURE 1.—Acute effect of exposure of guinea pigs to secondary amyl acetate vapor in air.

of the brain and moderate to marked congestion of the systemic organs. The lungs were moderately congested and emphysematous. Exposure to conditions which caused marked incoordination and narcosis (1.0 and 0.92 percent for 30 minutes) produced slight congestion of the brain, lungs, liver, and kidneys in animals killed immediately after exposure; but these findings were absent in animals killed for autopsy 4 to 8 days following exposure. Exposure to 0.5 percent for 810 minutes produced slight congestion of the lungs. No gross pathology was observed in animals exposed to 0.2 percent for 810 minutes.

SUMMARY OF FATALITY AND PHYSIOLOGICAL RESPONSE

The fatality and summary of the response of guinea pigs exposed to secondary amyl acetate vapor in air are shown graphically in figure 1 and given in conventional degrees of response in table 4. The results of each experiment are designated by a symbol which represents one of four different degrees of severity. The symbols represent the most severe response for a majority or at least 3 of a group of 6 animals exposed to a given condition. The response of none of the animals deviated markedly from that which is representative of the group.

The four degrees of response are given in the legend on figure 1. In addition to representing the response of each group by symbols, the symbols have been separated into three general fields or zones of probable response.

Table 4 gives the concentrations (obtained by direct experiment or extrapolated from table 3 and figure 1), which produce the degrees of response generally reported in the literature dealing with noxious gases. These data may be compared with toxicological data for other compounds (1, 3, 4, 5, 6, 7, 8, 9).

TABLE 4.—*Acute effects of exposure of guinea pigs to secondary amyl acetate vapor in air*

Acute effects of exposure after various periods of time	Concentration, percent by volume in air
Kills in a few minutes.....	(•)
Dangerous to life in 30 to 60 minutes.....	(◊)
Dangerous to life after several hours.....	0.5-1.0
Maximum amount for 60 minutes without serious disturbance.....	0.5
Maximum amount for several hours with but slight or no symptoms.....	0.2

* Not produced by 1 percent, the highest concentration obtained in a closed chamber by extended recirculation of air (30° C. and 740 mm pressure) over wicks wet with secondary amyl acetate.

CAUSE OF DEATH

Death apparently was due to a state of narcosis which terminated in death rather than to the irritation of the lungs. No animals died following exposure; they either died during exposure or survived the exposure and the 4- or 8-day post-exposure observation period. In some instances the animals were unconscious several hours after termination of exposure (1.0 percent for 90 minutes and 0.5 percent for 810 minutes), but appeared normal 24 hours after exposure.

WARNING PROPERTIES AND HAZARDS OF ACUTE POISONING

Men exposed to 0.5 and 1.0 percent vapor in air even for a short time pronounced the atmosphere extremely disagreeable because of strong odor and irritation to eyes and nasal passages, and even 0.2 per-

cent was very unpleasant. This latter concentration produced no marked symptoms and was apparently harmless to guinea pigs after one exposure of several hours.

WARNING PROPERTIES AND EXPLOSION HAZARDS

The explosion hazard of secondary amyl acetate is minimized by the distinct warning properties of concentrations below the inflammable range but cannot be ignored. A few determinations of the inflammable properties of the vapor of the secondary amyl acetate used in this study indicated the lower limit to be approximately 1.2 percent, and the flash point to be approximately 26.5° C.

SUMMARY AND CONCLUSIONS

The acute physiological response of guinea pigs to air containing a commercial grade of secondary amyl acetate ($(\text{CH}_3\text{CH}_2\text{CH}_2)_2\text{CH}_2\text{CHO.COCH}_3$) vapor was determined. A refined grade was also used in one experiment. The concentrations of the vapor ranged from those that produced death to those that produced no effect after several hours' exposure. The signs of response, the fatality, and the gross pathology are given, and the warning properties as observed by the exposure of persons are described.

1. Secondary amyl acetate produces narcosis, terminating in death in the higher concentrations. The symptoms are principally those of eye and nasal irritation and narcosis. Animals that did not die during exposure recovered.

2. The principal gross pathological findings were congestion of the brain, lungs, liver, and kidneys, as observed in the autopsies performed immediately after exposure.

3. At room temperature it was not possible to attain a concentration that was dangerous to the life of guinea pigs in 30 to 60 minutes. Exposure to 0.5 to 1.0 percent vapor is considered dangerous to the life of guinea pigs after several hours; 0.5 percent the maximum amount for 1 hour without serious disturbance other than eye and nasal irritation; and 0.2 percent is the maximum amount for several hours with slight or no symptoms.

4. Commercial secondary amyl acetate used in the experiments had a distinct odor and was markedly irritating to the nose and eyes of men in concentrations found to be apparently harmless to guinea pigs after several hours' exposure. Concentrations of the vapor well below the estimated lower inflammable limit were extremely disagreeable to men from the standpoint of odor and eye and nasal irritation.

ACKNOWLEDGMENTS

Acknowledgment, with thanks, is given to Surg. R. R. Sayers, United States Public Health Service, formerly chief of the health and safety branch, United States Bureau of Mines, for consultation and advice in this investigation, and to John Chornyak, formerly medical officer-in-charge of the pathological laboratory, and S. H. Black, formerly assistant surgeon, United States Bureau of Mines, for making the pathological examinations.

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LEGISLATION ENABLING INTERSTATE WATER COMPACTS

On June 8, 1936, the President approved Public Resolution No. 104 enabling the States named therein to conserve and regulate the flow of and purify the waters of rivers and streams whose drainage basins lie within two or more of the States. Congressional consent is a constitutional requirement for validity of interstate compacts. This resolution does not prescribe the legal process of consummating the compacts, but indicates a favorable attitude on the part of the Congress. Following is the text of the resolution:

[PUBLIC RESOLUTION—No. 104—74TH CONGRESS]

[H. J. Res. 377]

JOINT RESOLUTION

To enable the States of Maine, New Hampshire, New York, Vermont, Massachusetts, Rhode Island, Connecticut, Pennsylvania, West Virginia, Kentucky, Indiana, Illinois, Tennessee, and Ohio to conserve and regulate the flow of and purify the waters of rivers and streams whose drainage basins lie within two or more of the said States.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of the Congress of the United States is hereby given to the States of Maine, New York, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, Pennsylvania, West Virginia, Kentucky, Indiana, Illinois, Tennessee, and Ohio, or any two or more of them, to negotiate and enter into agreements or compacts for conserving and regulating the flow, lessening flood damage, removing sources of pollution of the waters thereof, or making other public improvements on any rivers or streams whose drainage basins lie within any two or more of the said States.

SEC. 2. No such compact or agreement shall be binding or obligatory upon any State a party thereto unless and until it has been approved by the legislatures of each of the States whose assent is contemplated by the terms of the compact or agreement and by the Congress.

Approved, June 8, 1936.

DEATHS DURING WEEK ENDED MAY 30, 1936

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended May 30, 1936	Correspond- ing week, 1935
Data from 86 large cities of the United States:		
Total deaths.....	7,792	8,246
Deaths per 1,000 population, annual basis.....	10.9	11.5
Deaths under 1 year of age.....	524	596
Deaths under 1 year of age per 1,000 estimated live births.....	47	54
Deaths per 1,000 population, annual basis, first 22 weeks of year.....	13.3	12.4
Data from industrial insurance companies:		
Policies in force.....	68,309,902	67,801,363
Number of death claims.....	13,560	10,469
Death claims per 1,000 policies in force, annual rate.....	10.4	8.1
Death claims per 1,000 policies, first 22 weeks of year, annual rate.....	10.8	10.5

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 June 6, 1936, and June 8, 1935

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 6, 1936, and June 8, 1935

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 6, 1936	Week ended June 8, 1935	Week ended June 6, 1936	Week ended June 8, 1935	Week ended June 6, 1936	Week ended June 8, 1935	Week ended June 6, 1936	Week ended June 8, 1935
New England States:								
Maine.....	1	1			699	157	0	0
New Hampshire.....					30		0	1
Vermont.....					274	25	0	0
Massachusetts.....	7	5			1,362	451	8	0
Rhode Island.....	1	1			63	601	0	2
Connecticut.....	2	5	3	3	218	761	3	1
Middle Atlantic States:								
New York.....	38	35	13	16	2,746	3,478	8	29
New Jersey.....	16	14	9	8	605	2,454	3	4
Pennsylvania.....	48	43			919	2,481	10	2
East North Central States:								
Ohio.....	19	18	5	7	610	1,414	9	7
Indiana.....	11	11	16	6	9	155	2	8
Illinois ¹	51	46	57	20	32	1,412	8	19
Michigan.....	13	8		1	43	2,888	2	0
Wisconsin.....	3	1	10	22	241	1,953	0	1
West North Central States:								
Minnesota.....	2	4			311	351	1	1
Iowa.....		4		2	3	220	1	2
Missouri.....	24	26	26	10	21	167	6	10
North Dakota.....	1	1		1	7	11	1	0
South Dakota.....	4	2		1	8	31	0	0
Nebraska.....	7	4			19	183	0	1
Kansas.....	8	4	1	1	10	380	1	1
South Atlantic States:								
Delaware.....		2			23	26	0	0
Maryland ²	4	6		4	322	96	5	10
District of Columbia.....	10	7			100	34	2	10
Virginia ³	8	6	38		72	357	13	18
West Virginia.....	14	11	18	23	46	186	6	1
North Carolina.....	8	9	2	1	70	50	6	1
South Carolina.....	4	10	63	67	24	15	2	0
Georgia ⁴	9	8					4	0
Florida.....		3	2		14	19	3	2

See footnotes at end of table.

*Cases of certain communicable diseases reported by telegraph by State health officers
for weeks ended June 6, 1936, and June 8, 1935—Continued*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 6, 1936	Week ended June 8, 1935	Week ended June 6, 1936	Week ended June 8, 1935	Week ended June 6, 1936	Week ended June 8, 1935	Week ended June 6, 1936	Week ended June 8, 1935
East South Central States:								
Kentucky.....	5	3	12	2	147	9	1	8
Tennessee.....	9	7	18	46	15	27	3	4
Alabama.....	7	5	15	15	6	80	0	0
Mississippi ¹	6	9						
West South Central States:								
Arkansas.....	1	6	7	21	3	36	0	0
Louisiana.....	14	9	4	2	13	36	3	1
Oklahoma ¹	1	11	43	51	15	63	3	6
Texas.....	26	28	83	98	241	85	1	1
Mountain States:								
Montana ¹	1	2	2	15	2	324	1	1
Idaho ¹				1	11	3	0	0
Wyoming ¹	1				4	18	1	0
Colorado ¹	4	3			31	330	1	0
New Mexico.....	7	5	6	2	47	8	2	0
Arizona.....		6	22	6	86	18	0	0
Utah ¹		1	6		50	3	0	0
Pacific States:								
Washington.....			3		299	347	0	0
Oregon ¹		1	10	19	97	114	0	4
California.....	27	23	538	31	1,603	1,451	3	4
Total.....	431	414	1,022	492	11,424	23,449	133	161
First 23 weeks of year.....	12,123	14,324	137,542	101,131	229,681	621,885	5,153	3,295

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 6, 1936	Week ended June 8, 1935	Week ended June 6, 1936	Week ended June 8, 1935	Week ended June 6, 1936	Week ended June 8, 1935	Week ended June 6, 1936	Week ended June 8, 1935
New England States:								
Maine.....	0	0	8	16	0	0	3	2
New Hampshire.....	0	3	11	9	0	0	0	0
Vermont.....	0	0	5	1	0	0	0	0
Massachusetts.....	4	0	235	197	0	0	2	2
Rhode Island.....	0	0	21	8	0	0	0	1
Connecticut.....	0	0	42	64	0	0	1	2
Middle Atlantic States:								
New York.....	3	3	655	903	0	0	2	11
New Jersey.....	0	2	248	165	0	0	3	5
Pennsylvania.....	2	2	436	573	0	0	7	11
East North Central States:								
Ohio.....	1	1	186	406	0	0	10	8
Indiana.....	0	1	73	55	7	1	6	3
Illinois ¹	5	1	453	994	12	5	6	9
Michigan.....	1	0	205	212	0	0	0	7
Wisconsin.....	1	0	301	435	16	14	0	3
West North Central States:								
Minnesota.....	0	1	221	214	6	8	0	8
Iowa.....	0	0	121	86	15	2	0	0
Missouri.....	0	1	104	45	2	1	2	7
North Dakota.....	0	0	38	48	6	0	1	0
South Dakota.....	0	0	41	12	8	3	0	0
Nebraska.....	0	0	47	44	27	42	0	3
Kansas.....	1	1	155	45	20	31	2	2
South Atlantic States:								
Delaware.....	0	0	1	7	0	6	0	1
Maryland ¹	0	1	49	66	0	0	2	1
District of Columbia.....	0	0	12	23	0	0	0	0
Virginia ¹	0	1	26	28	0	0	6	12
West Virginia.....	0	1	31	36	0	0	4	9
North Carolina.....	1	17	20	9	0	2	5	11
South Carolina.....	0	0	3		0	0	5	24
Georgia ¹	0	0	17	5	3	0	11	23
Florida.....	0	1	4	5	0	0	4	3

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 6, 1936, and June 8, 1935—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 6, 1936	Week ended June 8, 1935	Week ended June 6, 1936	Week ended June 8, 1935	Week ended June 6, 1936	Week ended June 8, 1935	Week ended June 6, 1936	Week ended June 8, 1935
East South Central States:								
Kentucky.....	0	0	21	24	0	0	8	10
Tennessee.....	0	0	17	18	0	0	6	14
Alabama.....	0	1	2	5	0	1	5	16
Mississippi ¹	0	0	8	6	1	1	7	8
West South Central States:								
Arkansas.....	0	1	2	—	0	0	1	3
Louisiana.....	0	2	3	4	0	0	16	12
Oklahoma ²	0	0	0	7	1	2	2	3
Texas.....	1	3	31	50	1	11	6	34
Mountain States:								
Montana ³	0	0	59	11	8	1	3	0
Idaho ⁴	0	0	11	2	3	1	0	0
Wyoming ⁵	0	0	39	24	7	16	0	0
Colorado ⁶	2	0	73	134	1	4	0	1
New Mexico.....	1	0	59	15	0	0	10	4
Arizona.....	0	0	14	18	0	0	1	2
Utah ⁷	0	0	26	126	19	0	0	0
Pacific States:								
Washington.....	0	0	54	44	4	38	1	1
Oregon ⁸	0	0	30	22	0	3	10	1
California.....	3	9	296	164	3	28	14	7
Total.....	26	53	4,514	5,385	171	215	172	284
First 23 weeks of year.....	428	618	164,730	160,582	5,203	4,383	2,754	3,392

¹ New York City only.

² Rocky Mountain spotted fever, week ended June 6, 1936, 20 cases, as follows: Illinois, 1; Virginia, 1; Montana, 2; Idaho, 4; Wyoming, 7; Colorado, 2; Oregon, 3.

³ Week ended earlier than Saturday.

⁴ Typhus fever, week ended June 6, 1936, Georgia, 10.

⁵ Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Menin- gococ- cus menin- gitis	Diph- theria	Influ- enza	Mala- ria	Mea- sles	Pel- lagra	Polio- mye- litis	Scarlet fever	Small- pox	Ty- phoid fever
<i>April 1936</i>										
Hawaii Territory.....	1	9	125	—	12	—	(1)	—	0	1
<i>May 1936</i>										
Arkansas.....	1	27	514	252	18	38	1	23	0	9
Connecticut.....	10	11	5	—	958	—	0	138	0	6
Delaware.....	—	1	—	—	60	—	0	15	0	—
District of Columbia.....	13	98	5	—	709	—	0	82	0	1
Iowa.....	8	17	36	1	25	—	1	674	169	12
North Carolina.....	28	56	53	—	170	141	6	69	2	18

¹ A report of 36 cases of poliomyelitis under treatment at a crippled children's hospital, not previously reported, includes cases occurring through the period since August 1930.

April 1936		May 1936—Continued		May 1936—Continued	
Hawaii Territory:	Cases	German measles:	Cases	Tetanus:	Cases
Anthrax.....	2	Connecticut.....	1,888	Delaware.....	1
Chicken pox.....	63	Delaware.....	16	Trachoma:	
Dysentery (amoebic).....	3	Iowa.....	26	Arkansas.....	1
Epidemic encephalitis.....	1	North Carolina.....	651	Typhus fever:	
Leprosy.....	6	Mumps:		Connecticut.....	1
Mumps.....	6	Arkansas.....	202	North Carolina.....	1
Whooping cough.....	23	Connecticut.....	331	Undulant fever:	
		Delaware.....	53	Arkansas.....	1
		Iowa.....	402	Connecticut.....	6
		Ophthalmia neonatorum:		Iowa.....	9
Chicken pox:		Arkansas.....	1	North Carolina.....	3
Arkansas.....	94	North Carolina.....	2	Whooping cough:	
Connecticut.....	371	Paratyphoid fever:		Arkansas.....	48
Delaware.....	34	Connecticut.....	3	Connecticut.....	483
District of Columbia.....	32	North Carolina.....	2	Delaware.....	35
Iowa.....	235	Rocky Mountain spotted fever:		District of Columbia.....	136
North Carolina.....	315	District of Columbia.....	2	Iowa.....	84
Conjunctivitis, infectious:		Septic sore throat:		North Carolina.....	94
Connecticut.....	19	Connecticut.....	9		
Favus:		North Carolina.....	7		
Connecticut.....	6				

WEEKLY REPORTS FROM CITIES

City reports for week ended May 30, 1936

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland.....	0	-----	0	204	3	2	0	0	0	5	22
New Hampshire:											
Concord.....	0	-----	0	0	1	1	0	0	0	0	13
Manchester.....	0	-----	0	0	1	0	0	0	0	0	11
Nashua.....	0	-----	-----	32	-----	1	0	-----	0	0	-----
Vermont:											
Barre.....	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Burlington.....	0	-----	0	24	0	0	0	0	0	0	8
Rutland.....	0	-----	0	16	0	0	0	1	0	0	9
Massachusetts:											
Boston.....	3	-----	0	313	17	50	0	10	2	32	204
Fall River.....	1	-----	0	4	1	5	0	2	1	0	31
Springfield.....	0	-----	0	1	0	6	0	0	0	2	28
Worcester.....	0	-----	0	117	1	4	0	2	0	1	45
Rhode Island:											
Pawtucket.....	0	-----	0	0	0	0	0	0	0	0	15
Providence.....	1	-----	1	13	4	1	0	6	0	1	68
Connecticut:											
Bridgeport.....	0	-----	1	2	1	3	0	2	0	1	17
Hartford.....	0	-----	0	0	2	3	0	0	1	3	31
New Haven.....	0	-----	0	2	1	0	0	0	1	15	46
New York:											
Buffalo.....	1	-----	4	44	11	32	0	3	0	1	151
New York.....	41	12	2	1,398	94	274	0	102	1	70	1,390
Rochester.....	0	-----	0	1	1	2	0	4	0	0	73
Syracuse.....	0	-----	2	54	1	13	0	1	0	14	36
New Jersey:											
Camden.....	4	-----	0	7	1	5	0	2	0	2	26
Newark.....	0	1	0	16	6	46	0	7	0	16	92
Trenton.....	0	-----	0	1	1	2	0	1	0	7	32
Pennsylvania:											
Philadelphia.....	4	2	2	526	22	64	0	25	0	73	461
Pittsburgh.....	4	1	1	8	12	104	0	7	0	30	130
Reading.....	0	-----	0	11	0	3	0	1	0	1	26
Scranton.....	0	-----	-----	0	-----	4	0	-----	0	0	-----
Ohio:											
Cincinnati.....	5	-----	0	21	1	17	0	10	0	3	109
Cleveland.....	1	2	0	106	9	46	0	14	0	126	179
Columbus.....	0	-----	0	2	3	4	0	3	0	0	83
Toledo.....	0	1	0	16	6	3	0	5	1	22	73

City reports for week ended May 30, 1936

State and city	Diph- theria cases	Influenza		Meas- les cases	Pneu- monia deaths	Scar- let fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
Indiana:											
Anderson	0		0	0	6	5		0	0	5	8
Fort Wayne	1		1	0	2	7	0	1	0	0	25
Indianapolis	1		0	0	11	25	0	0	0	11	94
Muncie	0		0	1	2	0	0	0	0	0	9
South Bend	0		0	0	0	1	0	0	0	8	10
Terre Haute	1		0	0	0	1	0	0	0	0	28
Illinois:											
Alton	0		0	1	0	4	0	1	1	2	2
Chicago	24	3	2	10	39	187	0	39	3	60	611
Elgin	0		0	0	2	0	0	0	0	2	12
Moline	0		0	0	0	3	0	0	0	3	3
Springfield	0		0	0	0	7	0	0	0	1	27
Michigan:											
Detroit	3		0	17	28	173	0	12	0	272	260
Flint	0		0	1	5	9	0	3	0	2	32
Grand Rapids	0		0	4	1	14	0	1	0	5	27
Wisconsin:											
Kenosha	0		0	0	0	3	0	0	0	1	7
Madison	0		0	5	2	14	0	1	0	6	12
Milwaukee	0	1	1	31	4	65	0	3	0	88	89
Racine	0		0	2	0	8	0	0	0	2	
Superior	0		0	0	1	14	0	0	0	0	9
Minnesota:											
Duluth	0		0	7	2	11	0	1	0	7	22
Minneapolis	5		0	208	1	71	0	6	0	15	85
St. Paul	0	1	1	159	7	17	0	1	0	5	
Iowa:											
Cedar Rapids	0			0		2	0		0	5	
Davenport	0			0		4	0		0	0	
Des Moines	0		0	0	0	5	4	0	0	0	42
Sioux City	0			0		14	12		0	0	
Waterloo	0			1		10	0		0	0	
Missouri:											
Kansas City	3		0	3	4	66	0	1	1	1	71
St. Joseph	0		0	0	3	1	1	1	0	1	24
St. Louis	4	1	0	3	15	27	0	13	0	5	248
North Dakota:											
Fargo	0		0	0	0	3	0	0	0	0	4
Grand Forks	0			0		0	0		0	0	
South Dakota:											
Aberdeen	0			0		3	0		0	0	
Nebraska:											
Omaha	1		0	22	5	21	4	6	0	0	74
Kansas:											
Lawrence	0		0	0	0	0	0	0	0	0	4
Topeka	0		0	0	3	24	0	1	0	0	25
Wichita	0		0	0	1	17	0	0	0	5	17
Delaware:											
Wilmington	0		1	8	2	0	0	1	0	7	36
Maryland:											
Baltimore	4	3	0	284	16	17	0	9	0	41	201
Cumberland	0		0	0	1	0	0	0	0	0	12
Frederick	0		0	0	0	0	0	0	0	0	5
District of Col.:											
Washington	9		0	148	8	20	0	11	0	41	161
Virginia:											
Lynchburg	0		0	0	1	0	0	0	0	17	14
Norfolk	0		0	0	3	1	0	2	0	0	19
Richmond	1		0	1	3	15	0	3	0	2	58
Roanoke	0		0	2	0	1	0	0	2	0	16
West Virginia:											
Charleston	0		0	0	0	0	0	0	0	0	16
Huntington	0		0	0	0	0	0	0	0	0	
Wheeling	0		0	31	0	0	0	0	0	0	14
North Carolina:											
Gastonia	0		0	1	1	0	0	0	0	0	7
Raleigh	0		0	0	0	0	0	1	0	7	19
Wilmington	1		0	0	0	0	0	0	0	0	9
Winston-Salem	0	1	1	7	2	0	0	2	1	0	19
South Carolina:											
Charleston	0	11	0	1	0	0	0	0	0	7	19
Columbia											
Florence	0		0	3	2	0	0	2	0	1	18
Greenville	0		0	1	5	0	0	0	0	1	32

City reports for week ended May 30, 1936

State and city	Diph- theria cases	Influenza		Meas- sles cases	Pneu- monia deaths	Scar- let fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
Georgia:											
Atlanta.....	1	1	0	0	9	8	0	4	0	4	74
Brunswick.....	0	-----	0	0	0	0	0	0	0	0	4
Savannah.....	0	-----	0	0	2	1	0	1	1	0	28
Florida:											
Miami.....	0	4	2	3	1	0	0	0	0	4	19
Tampa.....	0	1	1	9	1	1	0	3	0	0	22
Kentucky:											
Ashland.....	0	-----	0	2	0	3	0	3	0	0	14
Covington.....	0	-----	0	5	-----	2	0	0	0	2	21
Lexington.....	0	-----	0	40	9	4	0	1	1	7	62
Tennessee:											
Knoxville.....	0	-----	1	1	2	0	0	0	2	0	21
Memphis.....	3	-----	0	0	4	2	0	6	3	12	78
Nashville.....	0	-----	0	10	2	3	0	1	0	0	39
Alabama:											
Birmingham.....	0	1	0	2	5	0	0	9	0	2	65
Mobile.....	0	-----	0	1	3	0	0	0	0	0	19
Montgomery.....	2	-----	-----	0	-----	0	0	-----	0	0	-----
Arkansas:											
Fort Smith.....	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Little Rock.....	1	-----	0	1	0	0	0	0	0	0	-----
Louisiana:											
New Orleans.....	3	-----	4	4	7	3	0	11	1	53	144
Shreveport.....	0	-----	0	3	4	2	0	1	1	0	40
Oklahoma:											
Oklahoma City.....	1	-----	0	2	4	8	0	0	0	2	43
Texas:											
Dallas.....	3	1	1	103	5	0	0	0	0	1	70
Fort Worth.....	0	-----	0	1	4	1	0	1	2	0	37
Galveston.....	2	-----	0	3	4	1	0	0	0	0	12
Houston.....	4	-----	1	0	6	1	0	6	0	0	62
San Antonio.....	5	-----	2	8	4	0	0	10	1	0	79
Montana:											
Billings.....	0	-----	0	0	0	3	1	0	0	2	8
Great Falls.....	0	-----	0	0	0	1	0	0	0	3	5
Helena.....	0	-----	0	0	0	3	0	0	0	0	8
Missoula.....	0	-----	0	0	0	2	0	0	0	0	2
Idaho:											
Boise.....	0	-----	0	1	0	1	0	1	0	0	5
Colorado:											
Colorado Springs.....	0	-----	0	0	1	5	0	1	0	1	11
Denver.....	2	-----	1	26	6	11	0	7	0	26	81
Pueblo.....	0	-----	0	0	0	73	0	0	0	0	5
New Mexico:											
Albuquerque.....	0	-----	0	16	0	14	0	1	0	0	6
Utah:											
Salt Lake City.....	0	-----	0	9	1	20	2	1	1	17	43
Nevada:											
Reno.....	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Washington:											
Seattle.....	0	-----	0	193	3	5	0	3	0	10	94
Spokane.....	0	-----	0	9	0	20	0	0	0	4	28
Tacoma.....	0	-----	0	25	1	2	0	0	0	2	27
Oregon:											
Portland.....	0	-----	0	4	0	2	0	2	0	5	65
Salem.....	1	-----	-----	2	-----	0	0	-----	0	0	-----
California:											
Los Angeles.....	7	10	0	217	14	48	0	21	1	49	293
Sacramento.....	0	-----	0	1	2	7	0	3	0	11	33
San Francisco.....	1	1	0	120	8	64	0	4	1	25	156

City reports for week ended May 30, 1936—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Missouri:			
Boston.....	7	4	2	Kansas City.....	1	0	0
Rhode Island:				North Dakota:			
Providence.....	1	1	0	Fargo.....	1	0	0
New York:				Maryland:			
New York.....	4	2	0	Baltimore.....	3	1	0
Pennsylvania:				District of Columbia:			
Philadelphia.....	2	1	1	Washington.....	0	1	0
Pittsburgh.....	4	2	0	Virginia:			
Reading.....	1	0	0	Norfolk.....	1	1	0
Ohio:				Richmond.....	3	0	0
Cincinnati.....	1	0	0	North Carolina:			
Cleveland.....	2	0	0	Raleigh.....	0	1	0
Columbus.....	0	1	0	Wilmington.....	1	1	0
Indiana:				South Carolina:			
Indianapolis.....	0	1	0	Charleston.....	1	0	0
Illinois:				Kentucky:			
Chicago.....	3	1	0	Louisville.....	2	0	0
Springfield.....	1	0	0	Louisiana:			
Michigan:				New Orleans.....	1	0	0
Detroit.....	2	0	0	Texas:			
Wisconsin:				Houston.....	1	0	0
Milwaukee.....	1	0	0	California:			
Minnesota:				Los Angeles.....	0	1	2
Minneapolis.....	1	0	0				

Epidemic encephalitis.—Cases: Philadelphia, 1; Atlanta, 2.

Fellegre.—Cases: Charleston, S. C., 1; Brunswick, 1; Savannah, 4; Birmingham, 1; Mobile, 1; Montgomery, 1; New Orleans, 2; Dallas, 2; Los Angeles, 4.

Typhus fever.—Cases: Atlanta, 1; Mobile, 1.

FOREIGN AND INSULAR

CUBA

Provinces—Notifiable diseases—4 weeks ended May 2, 1936.—During the 4 weeks ended May 2, 1936, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Río	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer.....	2	2	1	7	5	3	20
Chicken pox.....		39	4	14	4	9	70
Diphtheria.....	1	7		6	1	5	20
Hookworm disease.....	2						2
Leprosy.....		5		1			6
Malaria.....	94	22	12	456	127	1,562	2,273
Measles.....	1	5		4	12		22
Poliomyelitis.....	1		1	9		5	16
Tuberculosis.....	11	48	20	63	16	42	200
Typhoid fever.....	11	41	21	19	15	104	211

DENMARK

Vital statistics—1934.—Following are vital statistics for Denmark, exclusive of the Faroe Islands, for the year 1934:

Population.....	3,656,000	Influenza.....	230
Births.....	65,118	Measles.....	13
Births per 1,000 population.....	17.8	Mumps.....	4
Deaths.....	38,049	Paratyphoid fever.....	6
Deaths per 1,000 population.....	10.4	Paratyphoid fever.....	7
Deaths under 1 year of age.....	4,194	Pneumonia.....	3,396
Deaths under 1 year of age per 100 live births.....	6.4	Poliomyelitis.....	107
Deaths from:		Puerperal fever.....	98
Cancer.....	5,283	Scarlet fever.....	45
Diabetes mellitus.....	669	Syphilis.....	64
Diphtheria and croup.....	67	Tetanus neonatorum.....	24
Epidemic catarrhal jaundice.....	21	Tuberculosis.....	2,038
Epidemic cerebrospinal meningitis.....	40	Typhoid fever.....	17
Epidemic encephalitis.....	29	Whooping cough.....	104
Erysipelas.....	114		

ITALY

Communicable diseases—4 weeks ended March 29, 1936.—During the 4 weeks ended March 29, 1936, cases of certain communicable diseases were reported in Italy as follows:

Disease	March 2-8		March 9-15		March 16-22		March 23-29	
	Cases	Com-munes affect-ed	Cases	Com-munes affect-ed	Cases	Com-munes affect-ed	Cases	Com-munes affect-ed
Anthrax.....	13	11	4	3	9	8	16	13
Cerebrospinal meningitis.....	26	19	20	20	20	17	31	30
Chicken pox.....	478	152	356	134	368	137	389	152
Diphtheria and croup.....	543	271	433	263	439	244	464	255
Dysentery.....	5	5	6	6	4	4	7	5
Hookworm disease.....	9	4	8	5	5	4	11	6
Lethargic encephalitis.....	2	2	3	3	5	5	2	2
Measles.....	1,756	284	2,097	323	1,932	287	2,227	311
Paratyphoid fever.....	27	27	20	19	28	22	32	29
Poliomyelitis.....	5	5	10	9	16	14	12	11
Puerperal fever.....	34	33	32	31	28	20	32	29
Scarlet fever.....	274	123	310	141	254	120	290	122
Typhoid fever.....	205	123	153	108	184	126	197	125
Undulant fever.....	40	30	48	41	40	33	90	62
Whooping cough.....	374	113	389	111	487	123	527	124

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

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for May 29, 1936, pages 718-730. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued June 26, 1936, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Smallpox

Argentina—Buenos Aires Province—Bahia Blanca—Punta Alta.—According to a report dated May 22, 1936, 26 cases of smallpox had occurred up to this date in Punta Alta, Bahia Blanca, Buenos Aires Province, Argentina.

Typhus Fever

Algeria—Algiers.—During the week ended May 16, 1936, 2 cases of typhus fever were reported at Algiers, Algeria.

Yellow Fever

Senegal—Tivaouane.—During the week ended May 30, 1936, 1 case of yellow fever was reported at Tivaouane, Senegal.