ANNUAL REPORT OF THE

SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE OF THE UNITED STATES

FOR THE FISCAL YEAR

1917

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LETTER OF TRANSMITTAL.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, December 3, 1917.

SIR: In accordance with section 9 of the act of Congress approved July 1, 1902, "An act to increase the efficiency and change the name of the Marine-Hospital Service," I have the honor to transmit herewith the report of the Surgeon General of the Public Health Service for the fiscal year 1917.

Respectfully,

W. G. MCADOO,
Secretary.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

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1917.

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE.

TREASURY DEPARTMENT,
BUREAU OF THE PUBLIC HEALTH SERVICE,
Washington, D. C., October 6, 1917.

SIR: In accordance with the act of July 1, 1902, I have the honor to submit for transmission to Congress the following report of the operations of the Public Health Service for the fiscal year ending June 30, 1917. This is the forty-sixth annual report of the service, covering the one hundred and nineteenth year of its existence.

The administrative organization of the bureau has been the same as heretofore, its field work being conducted through seven divisions, as follows:

(1) Scientific Research.
(2) Foreign and Insular (maritime) Quarantine and Immigration.
(3) Domestic (interstate) Quarantine.
(4) Sanitary Reports and Statistics.
(5) Marine Hospitals and Relief.
(6) Personnel and Accounts.
(7) Miscellaneous.

The administrative personnel of the bureau during the year has consisted of the following:

Surg. Gen. Rupert Blue.

Asst. Surg. Gen. A. H. Glennan, in charge of Division of Personnel and Accounts.

Asst. Surg. Gen. W. G. Stimpson, in charge of Division of Marine Hospitals and Relief.

Asst. Surg. Gen. J. W. Kerr, in charge of Division of Scientific Research.

Asst. Surg. Gen. W. C. Rucker, in charge of Division of Domestic Quarantine.

Asst. Surg. Gen. R. H. Creel, in charge of Division of Foreign and Insular Quarantine and Immigration.

Asst. Surg. Gen. J. W. Trask, in charge of Division of Sanitary Reports and Statistics.

Chief Clerk, D. S. Masterson.

Certain functions of the service are administered jointly by two or more of the bureau divisions. As an instance, the epidemic of poliomyelitis (infantile paralysis) which occurred in New York and elsewhere during the fiscal year may be cited. Through the division of Domestic (interstate) Quarantine measures for the prevention of the spread of the disease in interstate traffic were instituted. The Division of Scientific Research inaugurated laboratory studies and

epidemiological investigations with a view to gaining further knowledge of the nature of the disease and possible methods of its prevention or cure. The Division of Sanitary Reports and Statistics gathered and published currently in the Weekly Public Health Reports statistics relating to the occurrence of cases, thus enabling health officers in all sections to keep informed of the progress of the epidemic.

Another instance of the kind is the work of the service in preventing the entrance of typhus fever from Mexico. Measures to prevent possible carriers of the disease from entering the United States were supervised by the Division of Foreign and Insular Quarantine and Immigration. Precautions against its spread in interstate traffic from the localities in this country where cases occurred were taken through the field organization of the Division of Domestic (interstate) Quarantine.

Because of this joint supervision of some functions of the service these operations are discussed in the portions of this report devoted to the work of the several divisions. They are taken up, however, from the point of view of the relation of the respective divisions to the work accomplished. In the conduct of such work the possibility of duplication of effort is eliminated by close cooperation between division heads under the direction of the Surgeon General.

Following the declaration that a state of war existed, every effort was made to assist the other departments of the Government in their measures of defense. In accordance with law, the personnel and facilities of the service were by Executive order made available to the military forces. The efforts of its sanitary organization have been devoted largely to problems relating to sanitation and public health in areas surrounding military establishments and cantonments. Numerous sanitary experts have been detailed to the Army and Navy for special duty, on request of the military and naval authorities. Statistical information relating to disease prevalence has been currently supplied to the Counsel of National Defense and Army and Navy officials. Medical officers have been supplied vessels of the Coast Guard, now operating as a part of the Navy. Other special work has been undertaken and in certain instances successfully completed.

SCIENTIFIC RESEARCH.

As in previous years, laboratory and field investigations of the diseases of man and other public-health matters have been carried on during the past fiscal year through the Division of Scientific Research. For the final three months of the year, the administrative force of the division was principally occupied with health problems arising out of the entrance of the United States into the war. The date of the annual conference of State and Territorial health authorities with the service was advanced in order to effect a cooperation of these bodies as early as possible for the sanitation of the country in relation to war activities. Furthermore, as soon as the location of cantonments and training camps was decided upon by the Army authorities, sanitary surveys in the vicinity of such camps were commenced by the service in cooperation with the Army and the State and local health authorities. Four such surveys were being made at the end of the fiscal year, and plans had been completed for their extension to areas near all the camps. To permit of these activities, a large part of the personnel previously engaged in studies of the pollution of streams and other investigations was gradually transferred to the survey work. It was found that previous investigations in malaria, typhoid fever, rural sanitation, public health organization and administration, and pollution of streams were of value in the making of these surveys of extra cantonment areas, both because of the training the field workers had previously received and because of the data accumulated by the service as to the general status of sanitary conditions in the United States. Moreover, work in industrial sanitation prepared the way for cooperating in the supervision of the health of employees in industries related to the war. In other words, a large part of the public health work previously undertaken by the Government was of direct use to it in conducting its activities following the outbreak of the war.

Now that the country is engaged in raising a large army and assembling it at different points in the country, the problem of eradicating or controlling communicable disease is of even more importance than previously. Antityphoid inoculation and known means of preventing the spread of excreta-borne diseases will make the question of typhoid fever less significant than formerly, but the necessity for using every means to combat trachoma, a disease which has proven to be a grave menace to the fighting forces in all European wars, is evident. Careful inspection of recruits by the military authorities and treatment of those found to have the disease must be supplemented by efforts of health officials to keep the disease from being transmitted from civil to military populations at the different cantonments. Malaria is another disease which will reduce the efficiency of the troops to a great degree unless every precaution is taken. The great prevalence of tuberculosis in France at the present time makes the treatment of this disease of singular importance. In a war re-

quiring the utilization of every resource in order to secure success, conservation of health, both on the part of the individual and the various governmental authorities, takes its place beside the problems of raising armies, producing supplies, and transportation. It is felt that investigations of diseases and sanitary matters should therefore be continued along as broad lines as possible.

During the year a large number of such investigations were made through the division, the service using slightly increased appropriations for studies which appeared to be necessary in the light of its other public health work. In the field investigations every effort was made to cooperate with State and local authorities to the fullest extent possible, and the scientific studies were planned to relate closely to problems of immediate public health importance. For instance, as a result of research studies in malaria control it has been possible to advise local authorities as to the best means of reducing the prevalence of the disease. Demonstrations of these measures have been conducted in a number of places during the past year and have shown conclusively the effectiveness of the measures. Rural areas, where mosquito reduction seemed impracticable, have been practically freed from malaria by the use of screening and quinine, while in more thickly settled communities it has been possible practically to eliminate the Anopheles mosquito. A record of the results obtained will be found on page 19.

On account of the continuance of a special appropriation for rural sanitation, this important work was carried out effectively in a large number of counties. As it became evident that more assistance from localities was necessary for the ideal demonstration of methods in rural sanitation, Congress was asked to make an arrangement by which the Government would pay half of the expenses of such demonstration if the State and locality paid half. An appropriation of this nature has been made for the coming year, and it is expected that the rural sanitation work will therefore be even more helpful in the future.

Increased attention is being given by the service to problems of occupational diseases and industrial hygiene. It is realized that the necessity of maximum production during the period of the war will make this work even more significant and will also have a tendency to increase general interest in the health of workers. The service is obtaining a large amount of data which will be available to industries of all kinds in securing proper hygienic conditions.

School and mental hygiene studies have been continued on a somewhat larger scale. The examination of recruits during the past few months has indicated the presence in the general population of a vast number of defects which could have been corrected in childhood if they had been known. This fact emphasizes the need of surveys such as are being made by the service, as well as the need for systematic medical examination of school children and supervision of their health while engaged in what is really a compulsory occupation.

The exhaustive survey of pollution of the Ohio River watershed was completed during the year, and laboratory studies have been directed toward the further evolution of problems developed in this preliminary work, while the field studies have been extended to include a general survey of the conditions and effects of stream pollution in the Northeastern States.

A special appropriation by Congress has permitted the service to exercise greater control over the manufacture of biological products, and has permitted further development in the work of producing standards by which some of these products may be judged.

The above forms only a brief outline of the work done during the year. The field and laboratory investigations in full may be classified under the following headings:

(1) Surveys of the sanitary condition and needs of extra-cantonment areas; (2) diseases of man, including cerebrospinal meningitis, diphtheria, malaria, pellagra, poliomyelitis, scarlet fever, trachoma, and typhoid fever; (3) occupational diseases and industrial hygiene, including health insurance; (4) public health organization and administration; (5) school and mental hygiene; (6) rural sanitation; (7) pollution of streams; (8) pollution of coastal waters; (9) industrial wastes; (10) sewage disposal; (11) viruses, serums, toxins, and analogous products. In this report, headings are included for the Hygienic Laboratory (at which studies in connection with the field work and research problems were conducted) and also for the Leprosy Investigation Station at Honolulu.

SURVEYS OF EXTRA CANTONMENT AREAS.

The importance of protecting the health of both the civil and the military populations at this time can not be overestimated, and prompts the consideration separately of the work of the division relating to sanitary surveys of extra cantonment areas. It is to be noted, however, that such surveys are closely related to much other work of the division, including investigations in malaria, rural sanitation, public health administration, and sewage disposal. Recommendations are made on the basis of experience gained in work along these different lines.

At the end of the past fiscal year surveys were being conducted at Little Rock, Ark., Louisville, Ky., Petersburg, Va., and Hopewell, Va., but plans had already been completed for greatly extending this work, which was being developed in close cooperation with the States and localities, as well as with the military authorities. At the end of the year the following personnel had been detailed to this work: Asst. Surg. Gen. H. R. Carter, Surg. W. H. Frost, Passed Asst. Surg. Paul Preble, Asst. Surgs. C. E. Waller, and H. F. Smith, Epidemiologist A. W. Freeman, Sanitary Engineers H. R. Crohurst, J. K. Hoskins, J. A. A. Le Prince, H. W. Streeter, R. E. Tarbett, and H. H. Wagenhals, and Asst. Sanitary Engineer C. P. Rhynus. This force was largely increased early in the present year. In addition, several prominent sanitarians have been employed as consulting experts at nominal salaries while actually on duty.

Cerebrospinal Meningitis.

STUDY OF CASES AT SALUDA, VA.

On request of the State health authorities a small epidemic of cerebrospinal meningitis at Saluda, Va., was investigated by Passed Asst. Surg. J. P. Leake in March and April, 1917. Five cases occurred, two of which died before Dr. Leake's arrival. Improvement in the

others was manifest following the use of antimeningococcus serum furnished by the State board of health. The local authorities were advised with in regard to the measures to be taken to prevent the further spread of the disease.

STUDY OF CASES AT GREAT LAKES NAVAL TRAINING STATION.

On request of the Surgeon General of the Navy, Surg. G. W. McCoy was detailed on June 13, 1917, to investigate outbreaks of cerebrospinal meningitis at the Naval Training Station, Chicago, Ill., in cooperation with the State and local health authorities, and Asst. Surg. G. C. Lake was detailed to assist him. The sanitary conditions of the station and hospital were reported upon, and advantage was taken of this opportunity to make laboratory studies of the disease.

Special attention was necessarily devoted to the detection of healthy carriers and the length of time convalescents remain carriers. In the absence of a speedy test to determine the virulence of cultures from these cases a highly important problem has arisen as to how long such cases should be segregated and their effect on the civil and military population when finally released. Further work along this line is indicated.

Diphtheria.

OUTBREAK IN FLOYD COUNTY, GA.

In cooperation with the health authorities of Floyd County, Ga., and the city of Rome, Asst. Surg. W. H. Slaughter was detailed to make a study of an outbreak of diphtheria and to assist the local authorities in handling the situation. The outbreak commenced in October, 1916, resulting in the closing of the schools in Rome and of many in the county generally. By the middle of November most of the schools had been reopened. Only one fatal case occurred during the epidemic, and a vast majority of the clinical cases were mild. The service officer made an epidemiological study of the cases, assisted in the taking of cultures, and advised the authorities as to the best procedure in ending the epidemic. This procedure may be summarized briefly as follows: All suspicious cases were submitted for laboratory examination, all clinical or highly suspicious cases were treated with antitoxin, all homes in which clinical cases occurred were kept in quarantine, two successive negative cultures were required before release, infected quarters were required to be fumigated, all children in homes in which there were clinical cases were kept from going to public gatherings, social intercourse in general was interdicted or discouraged. The success of this procedure is indicated by the fact that when the work was brought to a close on December 8 no clinical case existed in the county.

Malaria.

Investigations of malaria have been conducted with headquarters at the United States Marine Hospital, New Orleans, La. Active charge of the investigations was exercised by Surg. von Ezdorf until his sudden death in the field in September, 1916, and in April, 1917, supervisory direction was assumed by Asst. Surg. Gen. H. R. Carter.

The staff has consisted of Passed Asst. Surg. R. C. Derivaux, Asst. Surg. L. L. Williams, jr., Sanitary Engineer J. A. A. Le Prince, Technical Assistant M. B. Mitzmain, Asst. Epidemiologists T. H. D. Griffitts and J. C. Geiger, one clerk, one microscopist, and one attendant.

SURVEYS.

In accordance with requests received from State and local health authorities and other agencies field surveys were made to determine the nature and extent of the factors influencing the prevalence of malaria, and to ascertain the measures most applicable for their control. Other surveys for special investigations and to ascertain the progress of control campaigns instituted in previous years were also engaged in.

The following is a list of places visited for purposes of survey or special investigation, and, in some instances, for educational lectures:

Alabama: Talladega Springs.
Arkansas: Crossett, Lake Village, Brinkley, Montrose, Hamburg, Little Rock, Texarkana.
Georgia: Points in Tift, Irwin, and Sumter Counties, Brunswick, Waycross, Augusta, Atlanta.
Illinois: Winnetka.
Louisiana: Crowley, Clarks, Monroe, Baton Rouge, New Iberia, Lake Charles, De Ridder, Shreveport, Tallulah, Alexandria.
Mississippi: Electric Mills, Cedars.
Missouri: Crystal City, St. Louis, Illmo.
North Carolina: Badin, Roanoke Rapids, Greensboro and vicinity, Lincolnton.
Ohio: Toledo.
Rhode Island: Providence.
South Carolina: Fort Lawn, Stephens Creek, Chester, Columbia, Nitrolee.
Tennessee: Memphis.
Texas: Survey along lines of Cotton Belt Railroad, Dallas, Waxahachie, Sherman, Tyler, Lufkin, Marlin, Keltys.
Virginia: Gilmerton, Dennys, Emporia, Wilson.

DEMONSTRATION WORK.

Roanoke Rapids, N. C.—As a result of continued activities at Roanoke Rapids, the site of the first demonstration of malaria control by antimosquito measures in the United States, a further reduction of malaria has been obtained, as shown by the following parasite indices obtained in October of each year: 1913, 13.75 per cent; 1914, 4.48 per cent; 1915, 3.51 per cent; and 1916, 0.53 per cent. This represents a reduction of 85 per cent in the last year and 96.15 per cent since the beginning of operations.

Electric Mills, Miss.—A reinspection of the antimalaria work, begun in 1914 at Electric Mills, Miss., was made to determine the further result of control operations. The following parasite indices were obtained: 1914, 11.76 per cent; 1915, 3.79 per cent; and 1916, 1 per cent—a reduction of 91 per cent.

Cedars, Miss.—At Cedars, a lumber community so situated as to make control through Anopheles suppression impracticable, quinine was administered for immunization and sterilization, the following parasite indices being obtained: 1915, prior to control work, 33.6 per cent; 1916, 7.88 per cent—a reduction of 76.55 per cent.

Crystal City, Mo.—Reexaminations have been made of the effect of antimosquito measures at Crystal City and Festus. The endemic

parasite index in 1915, prior to control work, was 5.62 per cent, and in 1916 was 0.92 per cent—a reduction of 83.63 per cent. The influence of this work is well represented in the reduction of insurance claims paid for sickness disability on account of malaria: 1915, $230.22; 1916, $61.66; and 1917 (Jan. 1 to June 20), $6.66.

Emporia, Va.—A repetition of the parasite index was made at Emporia, Va., to measure the degree of control gained by antimosquito measures. The index in 1915 was 9 per cent, and in 1916 3 per cent—a reduction of 68.09 per cent.

Wilson, Va.—In conformity with recommendations by the service, malaria control work was undertaken at Wilson, Va. Before operations, it is stated that no homes were without one or more cases and in some all occupants were attacked. Five deaths from cerebral malaria are said to have occurred during August, 1915. In 1916 but one case of malaria was reported, and this case was said to have been a relapse.

Demonstration work at other points.—Similar work has been instituted at Montrose, Ark.; Dallas, Sherman, Waxahachie, and Marlin, Tex.; and along the lines of the St. Louis & Southwestern Railroad.

COOPERATIVE DEMONSTRATION STUDIES WITH INTERNATIONAL HEALTH BOARD.

As stated in the last annual report, a cooperative arrangement was entered into with the International Health Board through its director general, Mr. Wickliffe Rose, for the purpose of conducting a series of intensive demonstrations of malaria control and to study the relative values of the several control measures. For the purposes of this work, two localities were selected:

(*a*) A town unit, at Crossett, Ashley County, Ark., for the intensive study of malaria control through the exclusive use of measures directed against mosquito propagation, and

(*b*) A rural unit, consisting of a group of plantations in Chicot County, Ark., in the vicinity of Lake Village, where screening and quinine were employed.

Active operations were begun in the two units in April, 1916, and completed in April, 1917, under the direction of a field director at each unit and under the immediate supervision of Asst. Surg. R. C. Derivaux.

Crossett, Ark.—The work included a survey and mapping of Crossett, which is a lumber community of 2,029 population (May, 1916), a study of the index of malaria prevalence by histories of infection and blood examination, and treatment of the various mosquito breeding places by ditching, filling, oiling, etc. No use was made of screening or quinine. About 10 miles of ditching were carried out and 1,350 gallons of oil used.

By a comparison of the parasite indices taken prior to the beginning and after the termination of control operations, the following measure of gain is obtained: May, 1916, 9.43 per cent; December, 1916, 2.47 per cent—a reduction of 77.45 per cent. In 1915, 2,502 calls for malaria were made by physicians, and in 1916, 741 calls were made, a reduction of 70.39 per cent. If the malaria season alone is considered, the reduction is 82.07 per cent. The per capita cost of malaria control operations in Crossett, exclusive of those for

administration and scientific study, was $1.23½, or about $0.10 per month.

Vicinity of Lake Village, Ark.—For the rural control studies, a group of 10 plantations with an aggregate of about 4,500 acres and 440 persons, 20.7 per cent white and 79.3 per cent colored, was selected. Each house or family was made a unit for control, and protection was given in one group through the use of carefully fitted screens and in another through the administration of quinine in immunization doses (for adults, 10 grains on two successive days per week). In both groups all malaria carriers were given intensive treatment for sterilization purposes (10 grains daily for 30 days).

Thirty-three houses were experimentally screened and systematic observations made through the year as to the efficacy of the screening and the health of the occupants. The average cost for screening per house was found to be $14.22, of which $8.11 was for labor and $6.11 for materials. The life of the screens was believed to be at least two years. Parallel observations by systematic inspections were similarly conducted in the group of individuals to whom quinine had been issued and, in addition, in a "negative control" unit of 120 colored persons living on two near-by plantations. In this latter group, in which a parasite index of 21.84 per cent was obtained, no malaria control measures were employed.

The reduction for all groups as illustrated by repetition of the parasite index is shown in the following summary:

	Controlled groups.	Negative group.
	Per cent.	*Per cent.*
May parasite index	16.04	21.84
December parasite index	5.58	19.23
Reduction	63.22	11.95

Among the occupants of the screened houses alone the first parasite index findings were 11.97 per cent, and in the second 3.52 per cent, the reduction obtained being 70.06 per cent.

At the beginning of operations quinine was issued to 69 persons for sterilization and to 237 for immunization. Among those to whom it was issued for immunization a reduction in the parasite index of 64.45 per cent was obtained, and to those to whom it was administered for sterilization a reduction in the numbers of carriers found at the first index was 68.12 per cent. Among the carriers observed throughout the season the reduction effected was 95.17 per cent.

A comparative study of the average costs for physicians' calls and drugs for malaria, losses of time through sickness, etc., in the groups in which protective measures were used in contrast with similar economic losses in the negative control group is summarized below:

	Controlled groups.	Negative group.
Per family loss	$0.23	$11.21
Per capita loss	.06	2.52

The details of the experiment at Crossett and Lake Village and the results obtained have been embodied in a report and published as Public Health Bulletin No. 88.

As shown by the chart on page 23, the results were remarkable. In fact, so clear were they that the community affected has continued the work in a highly satisfactory manner. Probably no more definite antimalaria demonstration has ever been made, certainly not in America; and if it is repeated (as it can be) in other sections of the country, the Federal Government will have contributed generously to the campaign for the control of malaria.

Hamburg, Ark.—In cooperation with the International Health Board, the service has commenced a second demonstration of mosquito control, similar to that at Crossett, at the neighboring town of Hamburg, the county seat of Ashley County. The results have not yet been determined.

EDUCATIONAL MEASURES.

As in previous years, educational and explanatory lectures have been delivered in connection with surveys made and conferences held for the institution of control campaigns. Every effort has been made to enlist the active interest and intelligent cooperation of physicians and people in the various communities by illustrated talks, demonstrations and field trips, and, as heretofore, educational work has been carried on in schools in connection with the collection of material for determining parasite indexes.

SCIENTIFIC STUDIES.

Infectibility of Anopheles punctipennis.—In a further series of studies with *A. punctipennis* conducted by Technical Assistant M. B. Mitzmain, 52 specimens were allowed to feed upon blood containing Plasmodium falciparum (subtertian malaria), and 14 infections were obtained. In a previous study with these species only negative results were secured.

Distribution of Anopheles and disappearance of infection.—Additional evidence has been obtained to indicate that *A. quadrimaculatus* exhibits a much greater tendency to invade the interior of dwellings than does *A. punctipennis*, and it is suggested that the more sylvan attributes of the latter may render its relation to the transmission of malaria of less sanitary importance. A seasonal study was conducted at the same time to determine the approximate date of disappearance of infected Anopheles under field conditions. The last infected example, an *A. quadrimaculatus*, was taken on November 15 (at Talladega Springs, Ala.).[1]

Effect of temperature on development of malaria parasites in mosquito.—In a series of studies conducted with Anopheles under artificially maintained low temperature, inhibition and cessation of development of parasites were observed. It is suggested by these results that intermittent low temperatures may so interfere with sporozoite development as to render infected mosquitoes innocuous at an earlier part of winter than has been heretofore supposed.[2]

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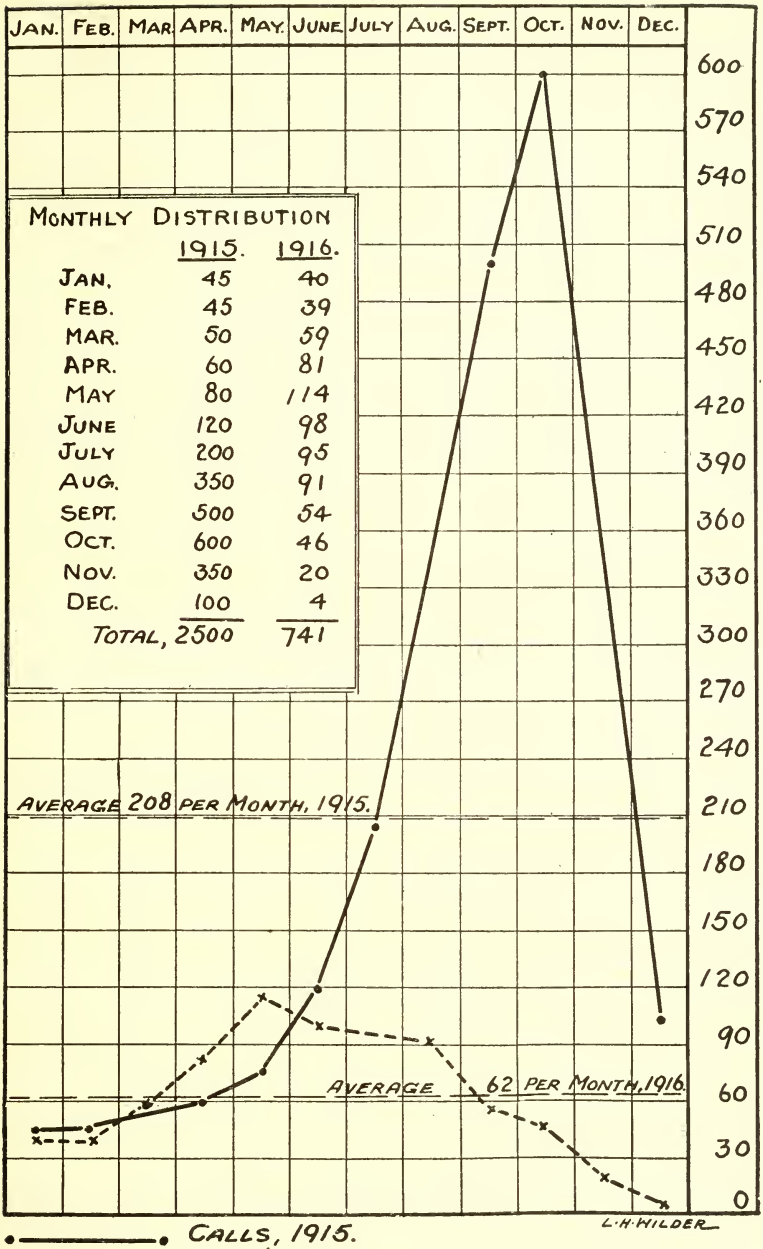
[1] Brief report published. (Reprint 393 from Public Health Reports.)
[2] Report published. (Reprint 422 from Public Health Reports.)



Reduction obtained at Crossett, Ark., by antimalaria work commencing on April 10, 1916. Physicians' calls for the disease in 1915 and in 1916.

Flight of A. quadrimaculatus.—In connection with studies of the relation of the artificial impounding of waters to malaria, the distance of flight of *A. quadrimaculatus* was studied by Sanitary Engineer Le Prince and Assistant Epidemiologist Griffitts. Attempts were made to recapture previously marked and liberated specimens. At Stephens Creek, S. C., of 1,543 Anopheles taken, 4 were identified; 3 of these were captured at distances of 5,565, 3,245, and 2,800 feet from the liberation station. At Fort Lawn, S. C., about 300 were liberated on the Catawba River and 3 retaken at a point 3,090 feet removed. These must have crossed the river (800 feet) at a single sustained flight.[1]

Breeding places of Anopheles punctipennis and quadrimaculatus.—Additional data have been collected during the year with reference to the preferential selection of various types of water for propagation places by *A. punctipennis* and *A. quadrimaculatus.*

Studies of screening materials.—For the purpose of determining the relative lasting qualities of various screening materials, an experimental battery of screen frames has been installed on the grounds of the Marine Hospital at New Orleans.

MALARIA INDEX AND OTHER BLOOD EXAMINATIONS.

Blood examinations have been made in the laboratory as heretofore for determination of the endemic parasite index and for other special purposes. The following is a list of places from which series of specimens have been examined for index determination since July 1, 1916:

		Number examined.	Number positive.	Parasite index.
				Per cent.
Alabama	Auburn	268	18	6.71
	Tuskegee	1,008	45	4.46
Arkansas	Newport	138	12	8.69
Mississippi	Greenville	448	97	21.65
	Cedars	114	9	7.88
	Electric Mills	205	3	1.46
Missouri	Crystal City	541	5	.92
North Carolina	Roanoke Rapids	757	12	1.58
Virginia	Wakefield	161	15	9.31
	Franklin	276	32	11.76
	Emporia	200	6	3.00
Total		4,116	254	6.19

Miscellaneous series of blood specimens collected at various places were also examined, the total number being 899, of which 36 (4 per cent) were found to be infected.

The total number of specimens examined from 1912 to June 30, 1917, was 26,238, of which 3,278 (12.49 per cent) were found to contain malaria parasites.

[1] Brief report of this study published. (Reprint 396 from Public Health Reports.)

IMPOUNDED-WATER STUDIES.

The investigation of the influence of the artificial impounding of water on the prevalence of malaria, begun in 1914, has been carried on as heretofore under the direction of Asst. Surg. Gen. H. R. Carter. Surveys were made at Parr Shoals, S. C., Blairs, S. C., Talladega Springs, Ala., Badin, N. C., Catawba River, Yadkin River, Broad River, and Stevens Creek, S. C. These surveys included physical and biologic examination of the ponds and their collaterals, together with investigations in the surrounding country to ascertain the degree of prevalence of malaria.

RELATION OF RICE CULTURE TO PREVALENCE OF MALARIA.

Intensive studies of the relation of the culture of rice to Anopheles propagation and malaria prevalence were begun during the latter part of the fiscal year at Crowley and Lake Charles, La.

As in other countries thus far, it has been found that the culture of rice in the United States is attended by the production of enormous numbers of Anopheles, but to what extent malaria prevalence has been influenced has as yet not been accurately determined.

HEMOGLOBINURIA.

Reports of cases of hemoglobinuric fevers were received from physicians in the States of Alabama, Arkansas, Florida, Louisiana, North Carolina, South Carolina, Tennessee, and Texas, and two cases were seen by one of the members of the staff during field investigations in July of 1916. In general, it is believed that cases are becoming more occasional, probably due to early recognition and better treatment of malaria.

PELLAGRA.

At the close of the previous fiscal year the following field investigations of pellagra, under the direction of Surg. Joseph Goldberger, were under way:

1. A study of the preventability of pellagra by proper diet.
2. A study of the transmissibility of pellagra.
3. A study of factors influencing pellagra prevalence in selected cotton-mill villages in South Carolina.

PREVENTABILITY OF PELLAGRA BY PROPER DIET.

A study of the preventability of pellagra by proper diet was begun in 1914 at two orphanages and at an asylum for the insane. A preliminary report of these studies was published. (Reprint 307 from Public Health Reports.) Since the results of these studies afforded clear indications of the preventability of the disease by this means, it was found desirable to enlarge the scope of the investigation by including an additional ward at the asylum and by adding a third orphanage, located at Columbia, S. C.

The results obtained in the second year of this study, completed in the fall of 1916, were in strict harmony with those of the first year. In not a single one of the individuals under observation at the orphanages or the asylum did pellagra develop either as an initial or a recurrent attack, in spite of the fact that the disease had been highly prevalent at all of the institutions before the service operations were commenced. On September 1, 1916, the studies at the orphanages were discontinued. A final report, including full details, will be published subsequently.

By reason of the greater significance likely to be attached to the results of studies of pellagra in the insane, it was deemed wise to continue the study at the asylum (Georgia State Sanatorium) for at least another year. At the close of the past fiscal year, the indications were that the results of the third year's study at this institution would in no wise differ from the results observed during the previous two years, namely, no new cases and no recurrences. So far as concerns pellagra in the wards under control of the service, it may be stated that the disease has ceased to exist.

TRANSMISSIBILITY OF PELLAGRA.

As it is widely held that pellagra is a communicable disease, an attempt was made to infect a number of individuals who volunteered for the purpose by inoculating them with blood, nasopharyngeal secretions, scales, urine, and feces from cases of pellagra. Six groups of experiments were made between April 25, 1916, and June 13, 1916, in which 16 volunteers, including 1 woman, participated. Seventeen cases of pellagra of various types and of different grades of severity furnished one or more of the experimental material. The period of observation of the volunteers following the inoculations has continued through the fiscal year. None has developed the disease or any indication of it. A detailed preliminary report of this experiment was published. (Reprint 376 from Public Health Reports.)

RELATION OF CERTAIN ECONOMIC FACTORS TO PREVALENCE OF PELLAGRA.

A study of factors influencing pellagra prevalence in selected cotton-mill villages in South Carolina was begun early in the spring of 1916 with Asst. Surg. G. A. Wheeler in immediate charge.

The villages first selected were seven in number, with an aggregate population of about 4,000. The completion of the studies at the orphanages in the fall of 1916 made it possible in January, 1917, greatly to extend this investigation by including 17 additional villages, having a population of over 20,000. During the second part of the fiscal year there have, therefore, been under observation 24 mill villages with an aggregate population of nearly 25,000.

The selection of the villages has been such as to permit of the study of pellagra prevalence under a variety of contrasting sanitary and other conditions. The data being collected relate to pellagra prevalence, sanitation, economic status, food availability, and seasonal variation in food availability. It is planned to terminate the collec-

tion of data by the end of December, 1917. Analyses of these will, it is believed, bring out fundamentally important facts bearing on the nature of the disease and will afford a basis for constructive recommendations for its control and eradication.

SPECIAL STUDIES OF PELLAGRA AT SPARTANBURG, S. C.

The special studies of pellagra which were begun in 1914 at the service hospital and laboratory at Spartanburg, S. C., have been continued during the year. Aside from a number of changes in personnel the general organization for clinical and laboratory studies has remained the same as described in the annual report for 1916. The laboratory investigations remained under the general supervision of Prof. Carl Voegtlin until September 28, 1916, and since that time have been carried on under the immediate supervision of Biochemist M. X. Sullivan. On January 5, 1917, the entire work of the station was placed under the general supervision of Surg. Joseph Goldberger, while Passed Asst. Surg. R. M. Grimm was continued in immediate charge of the clinical work and in immediate administrative charge of the station.

The clinical personnel of the station has consisted of Passed Asst. Surg. R. M. Grimm throughout the year; Asst. Surg. R. L. Allen until January 22, 1917; and Passed Asst. Surg. C. H. Waring since January 30, 1917. Passed Asst. Surg. M. H. Neill was on temporary duty at the station until September 15, 1916. Pharmacist L. G. Smith has been continued on duty at the station throughout the year. The laboratory personnel has consisted of Biochemist M. X. Sullivan and Food Analyst Kenneth K. Jones throughout the year; Asst. Biochemist Carl P. Sherwin and Organic Chemist George R. White until September 15, 1916; Asst. Biochemist Paul R. Dawson since June 13, 1917; and Physiological Chemist Ralph E. Stanton since June 11, 1917. Dietitian M. Maude Fauquier has been continued on duty at the station throughout the year. In addition to the above there have been employed 2 clerks, 6 female nurses, and 11 attendants.

Clinical studies.—Both hospital and out-patient treatment have been furnished at the station throughout the year. The treatment used has been almost exclusively dietary in character. Drugs have been used only to a very limited extent, and then, as a rule, only to meet complications.

In the treatment of hospital patients several diets are being tried out in order to determine the comparative therapeutic values of various articles of food in the treatment of pellagra. Quantitative records of the consumption of various dietary constituents are kept and become a part of the record of treatment. At the time of admission of each patient a clinical history is taken and a complete physical examination made, including examinations of the stools and urine. Careful semiweekly clinical notes, weekly weighings, and dynamometer tests are made by way of determining the progress of the cases. It is believed that such records in a large series of uncomplicated cases of pellagra will be of value in determining a diet or diets which may be of general use in the treatment of the disease.

The treatment of out-patients has consisted of serving to them at noon each day in the hospital dispensary a well-cooked, well-balanced meal, consisting of well-selected articles of food, presenting a considerable variety from day to day, served in generous quantities. For the most part these patients have presented mild types of the disease and have been able to continue at their work during the periods of their treatment. While this form of treatment can not be recommended as an exclusive therapeutic measure, it is found to have a certain limited value in this respect. It has also been found that the introduction of this one meal into the regular daily dietary of the patients treated in the out-patient clinic has had a very definite value in the prevention of recurrences of the disease and it is believed to have had considerable value in an educational way. The majority of the patients treated in the out-patient clinic have been from the families of cotton-mill workers living in the immediate vicinity of the hospital.

The following tables give the data relative to the patients treated and relative condition at the termination of treatment:

Hospital patients.

	Number.
Under treatment at the beginning of the year	31
Admitted to hospital during the year	129
Former hospital patients readmitted during the year	9
Total hospital patients treated during the year	169
Discharged from hospital treatment during the year	140
Remaining in hospital June 30, 1917	29
Days hospital relief was furnished during the year	7,802

Out-patients.

Under treatment at the beginning of the year	20
Admitted to out-patient clinic during the year	16
Former out-patients admitted during the year	9
Total out-patients treated during the year	45
Discharged from out-patient treatment during the year	23
Remaining under treatment June 30, 1917	22
Treatments (meals) furnished during the year	4,688

Relative condition of patients at termination of treatment.

Relative condition.	Hospital patients (number).	Out-patients (number).
Improved	124	20
Not improved	12	3
Died	4	0
Total discharged	140	23

In addition to the patients treated in the hospital and out-patient clinic a small number who could not be treated at the hospital were treated at their homes. In the treatment of these patients special preparations prepared in the station laboratory by Prof. Voegtlin were used. The administration of these preparations constituted the entire treatment. The patients were allowed to follow their own inclinations with respect to their diet.

Laboratory studies.—The work of the laboratory has consisted of analyses of foods, feeding experiments, and certain metabolic studies.

The work on food analysis has consisted chiefly of a study of the diet used by Goldberger and Wheeler in the production of experimental pellagra in the human subject.[1] Analyses were made for protein, carbohydrate, fats, ash, and calories. Proportional quantities of the different articles of food as used during the previous study were mixed for experiments on fowl. Two distinct sets of feeding experiments were made. In the first set a large batch of the mixed cooked food was dried at 80° C. and kept in storage for use. In the second set the same kinds and proportional quantities of ingredients were used, but they were prepared by a different cook in small batches every two or three days, mixed and used fresh.

These feeding experiments showed that the pellagra-producing diet was more or less lacking in the antineuritic food accessories. Beginning about 20 days after the feeding experiments were started, the fowl began to show marked signs of polyneuritis, with spastic gait, etc., which gradually led to complete paralysis and death. The administration of the purified "vitamine fraction" of yeast appeared to alleviate the polyneuritis in many cases. Experiments are still under way as regards the nature of the deficiencies in this diet. As stated elsewhere in this report the physiological and pharmacological action of vitamines and accessory food substances are receiving special attention by Prof. Voegtlin in the Division of Pharmacology of the Hygienic Laboratory. Feeding experiments were also made at Spartanburg with breads from various wheat flours and from various corn meals. The results of these experiments are now being prepared for publication.

The metabolic studies have consisted of a study of the chemical composition and physiological activity of the mixed saliva of individual pellagrins as compared with that of nonpellagrins. In some the rate of flow was found to be very slow, in others very rapid. In no case, however, was the diastatic power totally lacking. As a rule the sulphocyanate was found to be greatly decreased and the total solids and inorganic content increased, particularly in those cases with increased flow.

A comparative study of the urine of pellagrins for normal and abnormal constituents, in particular for physiological bases, is now well advanced.

Some progress has been made in the study of milk and milk separates, carried on to determine to what ingredient or ingredients milk owes its therapeutic power in the treatment of pellagra.

Coincident with the laboratory studies of Prof. Voegtlin while he was at Spartanburg, a special study was undertaken by him of 19 families in which pellagra had prevailed and other families in which no pellagra had prevailed, both groups being in the same community. These families were kept under observation for a year and the food supply and economic status in relation to the incidence of the disease studied. It is expected that the results of these observations, together with pertinent laboratory findings, will be published.

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[1] Reprint 311 from Public Health Reports (Nov. 12, 1915).

Poliomyelitis.

EPIDEMIC IN NEW YORK AND THE EAST.

As was stated in the last annual report, an epidemic of poliomyelitis appeared in New York City early in the summer of 1916. This epidemic rapidly assumed alarming proportions. Based upon an offer of the Secretary of the Treasury and its acceptance by the mayor of the city, the service, in cooperation with the city department of health and other local health authorities, undertook scientific investigations of the epidemic in and around New York City.

On July 6, 1916, Surg. C. H. Lavinder was directed to confer with the commissioner of health of New York City. As a result of this and other conferences the following were directed to report to Surg. Lavinder: Surgs. Edward Francis and W. H. Frost, Passed Asst. Surgs. J. R. Ridlon, J. P. Leake, W. F. Draper, L. R. Thompson, J. A. Watkins, and G. A. Kempf; Asst. Surgs. H. F. Smith, J. G. Wilson, P. M. Stewart, Epidemiologist A. W. Freeman, and Technical Assistant M. B. Mitzmain.

Briefly stated, the work of the service included: Epidemiologic and statistical studies of the entire epidemic in Greater New York and elsewhere; intensive field studies of 729 cases in various places, especially the Borough of Richmond; investigations with regard to paralytic disorders among domestic animals and their alleged relation to poliomyelitis in human beings; brief entomologic and rodent surveys in several places and the collection of autopsy material, both human and animal, for the Hygienic Laboratory.[1]

The number of cases in Greater New York, according to the figures of the department of health, was 9,023. The number in the entire epidemic area was upwards of 20,000. The epidemic spread rather rapidly over a wide area. The infection was a virulent one and the mortality high.

This epidemic is a notable event in the history of poliomyelitis, being, in numbers involved, many times larger than any epidemic previously recorded for this disease. Poliomyelitis as an epidemic disease seems really to be a development of our own time. Its rapid and continuous spread with the culmination in an epidemic of such size has placed this malady in the list of epidemic communicable diseases which demand the serious attention of all public-health officers.

A report of the entire investigation is in course of preparation and will be published as Public Health Bulletin No. 91.

PARALYSIS IN DOGS AT LITTLE ROCK, ARK.

On request of the State and local authorities, investigation was made by Epidemiologist A. W. Freeman of the prevalence of an unusual paralysis in dogs at Little Rock, Ark. History was obtained of between 15 and 20 cases occurring in the fall of 1916, mostly in valuable hunting dogs, but it was concluded that there was no valid reason to consider that the affection had any relation to human poliomyelitis. In fact, investigations of similarly reported outbreaks in other places have invariably failed to show any such relation.

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[1] See p. 62 of this report.

EPIDEMIC AT SALUDA, VA.

A remarkably heavy infection of poliomyelitis occurred at Saluda, Va., in October and November, 1916. On request of the State and local authorities investigation was made by Passed Asst. Surg. J. P. Leake. At least 9 cases had occurred in a population of 240 within a period of 30 days. This is a morbidity rate of 3,750 per 100,000, against the rate in New York for 1916 of 180 per 100,000. Quarantine of the infected district was recommended by Dr. Leake because of its isolation and rural character.

EPIDEMIC AT ELKINS, W. VA.

On request of the commissioner of health of West Virginia, Passed Asst. Surg. J. P. Leake was detailed on January 4, 1917, to investigate an outbreak of poliomyelitis at Elkins, W. Va. Asst. Surgs. Joseph Bolten and H. F. Smith assisted him. About 100 cases of the disease occurred in Elkins and vicinity. A house-to-house canvass of the city was made to discover abortive and unreported cases of poliomyelitis. This is the first time that a community so large as Elkins (7,000 population) has been surveyed for this purpose by physicians having experience in the disease, and it is believed that results of value in future campaigns against the disease were obtained. The virus of the disease was preserved for purposes of comparison with the virus of other epidemics. Dr. Leake also made recommendations for preventing the spread of the disease. As the epidemic took place in the winter, a new occurrence in the United States, the data obtained, together with a review of all other known winter outbreaks, have been compiled for publication.

SCARLET FEVER AND OTHER INFECTIOUS DISEASES OF CHILDREN.

At the request of the department of health of the city of Cincinnati, Ohio, Asst. Surg. H. F. Smith was detailed in January, 1917, to assist the department in special epidemiological investigations of scarlet fever in Cincinnati, to study the obscure epidemiologic features of its spread in an urban community. Considerable data were compiled, but this work was interrupted in order to begin the surveys of extra cantonment areas in the Southeastern States.

In this connection mention may be made of the preparation of a report by Asst. Surg. J. G. Wilson in regard to his study of 6,078 cases of infectious diseases of children among immigrants at Ellis Island. The report, which is in course of publication, includes a description of the nursing, technique, and general management of the contagious diseases hospital operated by the service at this place.

TRACHOMA.

TRACHOMA WORK IN APPALACHIAN MOUNTAINS.

During the past fiscal year the trachoma work has been conducted in much the same manner as in the preceeding three years, and the original objects of eradication and prevention have been adhered to.

The organization has been constantly improved in accordance with the experience gained.

One additional hospital has been established at Tazewell, Tenn. The clinics at this hospital have been large from the first, and the number of patients constantly under treatment at the hospital, which contains twenty-five beds, taxes its capacity.

As formerly, the hospitals have been used as the centers both for treatment of the disease and for educational purposes in eradication. It is very pleasing to note that the campaign of education in public health is having a very decided effect. Good results are noted in the patients, not only when in the hospitals, but when visited at their homes by the doctors and nurses in routine district work.

Patients from practically all parts of the United States have been treated in these hospitals, and the more generally the hospitals and their results become known, the more patients are received from a distance.

In conducting the hospitals due consideration has been given to as strict economy as was consistent with the accomplishment of the work.

Removal of hospital from Hindman to Pikeville, Ky.—As the hospital, which was established in Hindman, Knott County, Ky., in the fall of 1913, had accomplished its purpose at this location, it was transferred to Pikeville, Pike County, Ky., in September, 1916. In 1913 it was estimated that the trachoma cases in Knott County were about 10 per cent of the population, but according to actual canvass of the homes by the doctors and nurses, the county has been practically cleared of trachoma, and the few remaining cases who had, for one reason or another, not applied for treatment were recognized and left for the county health officer to treat, as well as any other cases which might arise subsequently. While this hospital was maintained at Hindman one of the local doctors, the county health officer, was instructed in the methods of diagnosis and treatment of trachoma, and he is now thoroughly capable of properly treating any cases which may subsequently come under his observation.

Pike County provided an excellent house, accommodating 25 patients. The new location has proved a good one, as is seen by the fact that the amount of work done is limited only by the capacity of the institution. The enthusiasm of the patients and the people in general has constantly increased.

Effects of trachoma.—While blindness often results from trachoma, it is now recognized that this is only one, and possibly not the worst, feature of the disease. We know that it lasts for years with constant irritation and discomfort to the patient, impairing his earning capacity and the fighting power of the State, ruining life and happiness of entire families, and finally terminating in total blindness. After nearly a lifetime of misery, the patient is often seen dwarfed in mind and warped in body with the trichiasis, entropion, and other sequelæ still remaining to harass and irritate the sightless eyes.

Relation of treatment of trachoma to the war.[1]—Now that we are engaged in raising a large army, the problem of eradicating trachoma is of even more importance than formerly. The history of every

[1] An article entitled "Trachoma and the Army: the dangers incident to enlisting recruits affected with the disease," by Surg. John McMullen, was published (Reprint 408 from Public Health Reports.)

European war shows that trachoma has proven to be a grave menace to the efficiency of the fighting forces, invaliding thousands and blinding large numbers. In the Russo-Japanese War, trachoma was a formidable enemy in the Japanese Army, and a large number of troops were isolated and treated for it. It has also been reported that an epidemic of trachoma is causing considerable anxiety in France, the disease having been brought to that country by African soldiers and laborers.

Armies are originally infected with trachoma from the civil population in the areas from which recruits are accepted and carry it back to the people when men who have served their enlistment or become incapacitated are discharged. It is therefore very essential that the eyelids of all soldiers and applicants be everted. If they are found to be otherwise than smooth and pink, if there is any redness or secretion, such cases should be segregated and examined by those trained in the diagnosis of trachoma. An applicant who is found to be suffering with the disease should not be immediately rejected but should be given treatment and again examined to determine whether he has resulting visual defects sufficient to debar him. In this way a case of contagious disease is eliminated, and probably a good soldier gained. Any case of trachoma or suspected trachoma detected among soldiers or sailors should be immediately isolated and given care and treatment until cured, or found not to be suffering with it.

Serious consideration should be given to trachoma as a health problem in the environments of the cantonments and military reservations. Particularly is this true in some of the Southwestern States where the disease is known to be endemic and where it is likely that trachomatous persons will congregate in the vicinity of military cantonments.

Report as to hospitals.—The locations of the various hospitals are in the most infected districts and therefore of the greatest importance in eliminating the disease from men enlisting in the military services. It has been the endeavor constantly to improve all six of these hospitals with a view to rendering better service in the work for which they have been established. Weekly talks are made to the hospital patients, and the educational portion of the work has been continued and improved upon where thought necessary. The district visits by the station doctors and nurses have been continued when their services could temporarily be spared from the hospitals.

The total attendance at these hospitals during the year was 18,430 and the total number of individual treatments was 127,914. One-half of the trachoma cases applying at the hospitals for treatment were found to have defective vision as the result of this disease. This impairment of vision ranged from comparatively slight defects to total blindness. One thousand nine hundred and seven patients were admitted to the hospitals and 1,686 operations performed. Of this number 442 were performed under general and 1,244 under local anesthesia. The same difficulty in securing the exact number of cures effected was experienced as in former years. Patients once cured and living a long distance from the hospital usually do not return and the result of the treatment is, therfore, not known or

entered upon the clinical record. It is estimated that about 1,500 cures were effected during the fiscal year. The total days relief furnished was 21,691 and 29,542 rations were furnished at a total cost at the six hospitals of $8,904.37, making the average cost per ration $0.30.

Dispensary and hospital treatment, operations, etc.

	Jackson Hospital (Kentucky).	London Hospital (Kentucky).	Pikeville Hospital (Kentucky).	Coeburn Hospital (Virginia).	Welch Hospital (West Virginia).	Tazewell Hospital (Tennessee).	Grand total.
DISPENSARY RELIEF.							
Old cases, all causes	3,015	1,237	1,810	800	890	3,189	10,941
Old cases, trachoma	2,291	888	1,474	677	473	2,625	8,428
New cases, all causes	1,348	1,134	1,389	953	939	1,641	7,404
New cases, trachoma	299	243	351	157	189	467	1,706
Total attendance	4,358	2,305	3,289	1,750	1,830	4,898	18,430
Total number of treatments	4,474	2,459	3,768	1,764	1,872	5,152	19,489
Average daily attendance	12	6	9	5	5	14	9
Cases impaired vision from trachoma	178	130	297	69	86	139	899
Cases corneal opacity from trachoma	128	48	112	33	39	63	423
Cases blindness both eyes from trachoma	0	3	7	0	1	0	11
Cases blindness one eye from trachoma	4	22	28	1	0	2	57
Cases ulcer from trachoma	64	42	46	18	31	16	217
Cases pannus from trachoma	109	35	169	28	53	77	471
Cases entropion from trachoma	43	29	68	24	20	21	205
Cases trichiasis from trachoma	26	15	31	19	16	5	112
Cases photophobia from trachoma	185	125	138	57	71	197	773
Cases conjunctivitis	459	236	419	107	469	700	2,390
Cases glaucoma	1	0	0	2	0	3	6
Cases trachoma cured	121	133	106	153	38	162	713
HOSPITAL RELIEF.							
Cases remaining from previous year	14	10	17	3	14	0	48
Cases admitted during the year	270	299	473	213	216	388	1,859
Cases discharged during the year	275	301	460	210	227	379	1,852
Cases remaining at close of year	9	8	19	6	3	9	54
Days relief furnished	4,126	3,886	5,859	1,943	2,485	3,392	21,691
OPERATIONS.							
Operations under general anesthesia	74	87	94	39	46	102	442
Operations under local anesthesia	135	182	258	254	105	310	1,244
Total number of operations	209	269	352	293	151	412	1,686

[1] Hindman.

Field clinics.—The field clinics have been continued for the purpose of stimulating interest among the doctors and the general public, 9 being held in various sections during the year. At these clinics 272 operations were performed. About 100 physicians were in attendance, and these were instructed in the diagnosis, prognosis, and treatment of trachoma and its sequelæ. In the course of the clinics 2,388 persons were examined and 466 trachoma cases found. It is hoped that during the next year more of these field clinics will be held in the various States where the work is being conducted.

District work.—The district work was conscientiously conducted by the doctors and nurses and 449 public talks were given to audiences estimated at 21,805 people and 1,227 house-to-house visits were made. The total number of schools visited was 325 and 11,508 pamphlets, describing the nature and prevention of trachoma, were distributed.

Cooperation of States and localities.—The States in which the work is being conducted contributed as follows: Virginia $1,200, West Virginia $300, and Tennessee $495. In addition to the money contributed, the State boards of health have given their thorough cooperation in the prosecution of this work. The local health authorities have furnished buildings and other assistance.

SPREAD OF TRACHOMA INTO OTHER STATES.

Reports from various sections of the United States are constantly being received to the effect that trachoma is found more or less prevalent and in some instances is proving a serious menace to the public health of the community and is preventing the children from attending school. This is an indication that trachoma is more widely spread than is generally believed. That it is constantly on the increase is not to be wondered at when the contagious character of the disease is considered. The work of eradication and prevention will, therefore, necessarily have to be extended into other States.

TRACHOMA AMONG SCHOOL CHILDREN AT NOGALES, ARIZ.

In an examination of 617 school children for trachoma at Nogales, Ariz., made unofficially, Asst. Surg. A. L. Gustetter found 20 pupils with the disease, a percentage of 3.24, as against 5.05 the previous year.

Typhoid Fever.

In addition to rural sanitation, which relates primarily to the reduction in the prevalence of typhoid fever, the following investigations of that disease were made:

EPIDEMIC AT BIRMINGHAM, ALA.

Owing to the unusual number of cases of typhoid fever at Birmingham, Ala., in June and July, 1916, the State health department asked the assistance of the service in investigating the epidemic, and Surg. L. L. Lumsden was detailed to this duty. He found that 451 cases occurred from June 1 to July 18, whereas the average for this period in previous years was 113. It was concluded that the epidemic was caused in large part by ice cream made by one manufacturer, and that in all probability the infection came from milk or cream secured from some dairy or dairy farm outside of Birmingham. Local factors other than the ice cream, such as insanitary privies, were considered partly responsible for the outbreak of the disease. Recommendations were made to the authorities for the purpose of preventing a similar epidemic in the future.

EPIDEMIC AT BRUNSWICK, MO.

On request of the health authorities, Surg. M. J. White was detailed on August 26, 1916, to investigate a small outbreak of typhoid fever at Brunswick, Mo. He found that 25 to 30 cases had occurred, and that the water and factory ice cream were the principal sources of infection.

RELATION OF TYPHOID FEVER IN PHILADELPHIA TO OYSTERS.

On request of the health department of Philadephia and the United States Bureau of Chemistry, Surg. H. S. Cumming was detailed to make an investigation of the suspected relation between oysters and cases of typhoid fever in Philadelphia. He was unable to establish any definite connection, although it appeared possible that some of the cases were the result of infected oysters.

TYPHOID FEVER AT VERSAILLES AND BURNSIDE, KY.

On request of the State health and other authorities, a study of typhoid fever at Versailles and Burnside, Ky., was made by Epidemiologist A. W. Freeman from April 16 to 19, 1917. In the case of Margaret College at Versailles, where the cases occurred, it appeared most probable that the infection was due to the presence in the kitchen or pantry of the college of a chronic carrier of typhoid bacilli, but the evidence, although not pointing to any other cause, was not conclusive. In the case of Burnside, it was concluded that the outbreak was due to an infection of the city water supply.

EPIDEMIC AT CHARLESTON, W. VA.

In cooperation with the State and city boards of health, an investigation was made of an epidemic of typhoid fever occurring during May, 1917, at Charleston, W. Va. The study included the collection of the usual epidemiological evidence regarding all reported cases and unreported cases located during the investigation. In addition investigation was made of the public water supply, the milk supply, and the general sanitary environment. Epidemiologist A. W. Freeman was in charge of the study, and associated with him were Prof. E. B. Phelps and Sanitary Bacteriologist E. E. Smith. It was concluded that the epidemic was due to infection conveyed by the city water and that this infection reached the city water through failure properly to operate the filtration and chlorinating plants. A report of this investigation was published.[1]

Occupational Diseases and Industrial Hygiene.

Studies in occupational diseases and industrial hygiene were continued under the general direction of Surg. J. W. Schereschewsky. Laboratory examinations necessary to the field studies have been conducted in the Marine Hospital Building at Pittsburgh.

HEALTH CONDITIONS SURROUNDING EMPLOYMENT OF WOMEN IN WISCONSIN.

This study was begun in November, 1915, to assist the Wisconsin Industrial Commission in obtaining data upon which the hours of employment for women might be fixed under the State law providing that such working hours "shall not be prejudicial to their health, safety, or welfare."

[1] Public Health Reports, Aug. 17, 1917.

To secure an idea of the general industrial environment, hours of labor, and sanitary status of the establishments, there was first made a survey of the women-employing industries of the State. One hundred and forty-one establishments, covering practically every industry employing female labor, were surveyed. The total environment of female workers was next studied by a special female field investigator, under the supervision of Passed Asst. Surg. Robert Olesen. This was followed by a special study of the fatigue curve in women workers as reflected in the hourly production. Records of the production of individual operators throughout each hour of the day were collected in order to study the onset of fatigue. Studies were pursued in 19 departments of 15 manufacturing establishments by a force of 7 special female field investigators under Passed Asst. Surg. Olesen. The studies were entirely concerned with piecework operations, as these are the only kind which lend themselves readily to such studies. Under the conditions of the work performed in the departments studied, although signs of fatigue were apparent during the day, there was no evidence of cumulative fatigue. This was undoubtedly due to the fact that the number of hours worked by no means corresponded to the theoretical factory day, because of time losses, which were 14.2 per cent in the case of the 10-hour industries. All time not actually devoted to the piecework was included in this percentage.

In the shorter working periods the time losses tended to become less, being relatively much less in the special case of a group of operators working in an incandescent-lamp factory on an 8-hour day and a 45-hour week. It was evident from the studies that the women worked considerably below the pace it was possible to attain. Besides trips to the toilets, to the dressing rooms, and for drinking water, premature stopping of work, early washing up, and an inclination to gossip were all responsible for considerable loss of time in factories operating on the 10-hour basis. From careful observation the conclusion seemed warranted that these time losses were protective or defensive measures instinctively practiced by the operators in order to ward off the accumulation of fatigue.

Because of the facts obtained by a study of the time losses, the manager of one of the establishments studied voluntarily placed 10 of the operators in one department on an 8-hour day, with the result that in a short space of time the operators not only attained the production of the 9-hour day, but exceeded it slightly. So far as piecework operations were concerned, the conclusion seemed inevitable that by efficient management, thus preventing time losses due to the breaking down of machinery, waits for material, and shortage of material, as much work could be done in an 8-hour day as in a 10 hour day if the employees also eliminated unnecessary time losses. On the other hand, it seems justifiable to conclude that attempts to eliminate these losses, so far as the longer working periods are concerned, might well result in a speeding-up process which in the end would be detrimental to the health of operators.

In view of the fact that it seems practicable to accomplish by proper management as much work in an 8-hour day as in the 10-hour day, the shorter working-day must be regarded as advantageous both to the woman worker and the manufacturer under the conditions as they exist in Wisconsin industries.

HEALTH HAZARDS OF CHEMICAL INDUSTRY AND HEALTH OF CHEMICAL WORKERS.

In 1916 the Public Health Service was requested by a large chemical company to study the health hazards in its various plants in order to make recommendations which would result in the elimination of health hazards and assist in maintaining the health of the personnel. This company operates some 22 plants in the United States, of which 9 have been studied in detail. Seven of these plants were devoted to the manufacture of the so-called heavy chemicals, which include the manufacture of sulphuric, nitric, and mixed acids, muriatic acid, and various salts. Two of the plants manufactured coal-tar products such as nitrobenzol, dinitrobenzol, aniline, and similar products.

In addition to careful sanitary surveys in these factories, the physical condition of 918 chemical workers was studied by means of careful physical examination, special attention being paid to the effects upon health of work in the manufacture of nitro and amido derivatives of benzol. During the course of the study, it was practicable to make important recommendations to the superintendents of the various plants to enable them to improve the conditions surrounding the workers.

These studies were carried out by Surg. J. W. Schereschewsky, Passed Asst. Surg. Robert Olesen, Scientific Assistant Allen R. Howard, and Scientific Assistant Harmon West.

HEALTH HAZARDS IN CONNECTION WITH MANUFACTURE AND DISTRIBUTION OF ILLUMINATING GAS.

Following the studies of the effect of gas-heated appliances upon the air of workshops (reported in Public Health Bulletin No. 81), the service undertook at the request of the Federal Bureau of Standards a study of the health hazards connected with the distribution and manufacture of gas, so that the necessary recommendations for the protection of workers might be incorporated in a national gas safety code which was being prepared by the Bureau of Standards. Accordingly, Passed Asst. Surg. J. A. Watkins was detailed to make a study of this matter, having obtained permission from one of the largest gas-making companies in the country to study, from the health standpoint, the conditions surrounding the workers engaged in this industry. Studies of the health hazards in connection with the manufacture and distribution of carbureted water gas, the type of illuminating gas most in use at the present time, have been carried on since February, 1917. The work had the following scope:

1. Study of all the processes concerned with the manufacturing of carbureted water gas, with special reference to the exposure of the workers to heat, dust, and gas poisoning.
2. Special studies of the hazards due to exposure to weather conditions and to gas poisoning in the distribution of gas.
3. Studies of the physical condition of gas workers by means of physical examinations, and careful hæmatological studies.

4. Examination of air samples for their content of carbon monoxide, collected in various working locations.
5. Studies of the body temperature of workers in heat exposed situations.

HEALTH HAZARDS OF TEXTILE INDUSTRY.

The State Department of Labor and Industry of Pennsylvania requested the cooperation of the service in making a study of the textile industry in that State to the end that a code for the regulation of the industry from the safety and health standpoints might be drawn up. Studies of the industry were accordingly begun about March 30, 1917, the field work being in charge of Surg. F. C. Smith, assisted by Scientific Assistants William P. Bramlett and Lloyd W. Johnson. As there is a high proportion of women among the textile workers, two special female field investigators were employed. The cooperation of the Industrial Disease Clinic of the University of Pennsylvania Hospital was obtained, and Dr. T. Grier Miller, in charge, was appointed a scientific assistant on half time, in order to conduct special studies of the physical condition of workers.

The work, which is now practically complete, has had the following scope:

1. Intensive survey of a silk mill, a lace mill, a carpet mill, and a blanket mill.
2. Complete physical examinations of some 350 textile workers.
3. Studies of the daily temperature of 440 workers.
4. Studies of the amount of dust in the air of textile mills.
5. Radiographic examinations of workers exposed to organic dust in the textile industry.
6. Studies of the total environment of textile workers.
7. Extensive surveys of various textile establishments.

On the whole it may be said that, so far as the textile processes studied are concerned, these processes present but few hazards to the health. The results of the physical examination of textile workers show that the industry per se can readily be conducted so as to be practically devoid of any essential hazard to the health. On the other hand, numerous defects in regard to ordinary factory sanitation were found in some of the establishments visited.

VISUAL CONDITION OF WORKERS ENGAGED IN OCCUPATIONS LIKELY TO CAUSE EYE STRAIN.

In the last annual report reference was made to studies of vision, conducted as part of an illumination survey of Federal departments. As the Federal bureaus employ a large body of employees who perform exacting eye work, it was thought that a study of the ocular condition present in such workers should yield data of interest. Accordingly Surg. G. L. Collins was detailed to make these studies, a room in the Treasury Building being fitted with the equipment necessary to make complete eye examinations. Representative groups from the Treasury Department, the Bureau of Engraving and Printing, and the Government Printing Office were carefully examined

and full records made of the ocular conditions found. During the fiscal year 502 such examinations were made, bringing the total to about 1,500.

The scope of the study has now been amplified by studying the effect in different cities of various occupations on the eyes of workers and the incidence of eye tests in different industries.

HYGIENIC CONDITIONS OF SHOP LIGHTING.

At the request of the Wisconsin Industrial Commission, the service undertook a study of the hygienic conditions of illumination in workshops in the State, special attention being paid to industries engaged in supplying the Government with war materials. Assistant Physicist Davis H. Tuck was detailed to this work.

The general scope of the study consists in careful illumination surveys of various industrial establishments by means of photometric measurements in various working locations; studies of the arrangement of working planes, with reference to sources of light; studies of glare effects and other impediments to easy vision, arising either from defects in the illuminating system or from peculiarities of the industrial process considered, followed by recommendations for the correction of existing defects. This work was begun May 14, and so far complete surveys have been made in three establishments. It is worth noting that as a result of these surveys extensive changes have been made in the illuminating conditions in these plants.

CHILD-LABOR PROBLEMS IN RELATION TO THE HEALTH OF MINORS IN MASSACHUSETTS.

In the studies of child-labor health problems in Massachusetts, the cooperation of Asst. Surg. M. V. Safford with the Massachusetts State Board of Labor and Industries has been continued. The results of an investigation of health conditions among male minors employed in the cotton mills was published in August, 1916, as Public Health Bulletin No. 78. Preparations had been made by the State board of labor and industries for a similar investigation in the rubber manufacturing industry under the personal direction of Asst. Surg. Safford, but the work was interrupted by his detail to New York City during the summer for duty in connection with the poliomyelitis epidemic. His cooperation with the State authorities has been virtually confined to consultations with the board of labor and industries regarding actual situations in which the health of minor employees has been involved.

MINE SANITATION.

Investigations of the occupational diseases of the mining industry and of mine sanitation, conducted in cooperation with the United States Bureau of Mines, were continued during the last fiscal year. The report of the prevalence of miners' consumption and tuberculosis among miners in the Joplin district was published as Public Health Bulletin No. 85.

Butte (Mont.) district.—The investigation of the prevalence of miners' consumption among the miners of the Butte district, begun in May, 1916, is still being carried on.

The Butte mines are large and deep, and it has become evident that the incidence of miners' consumption is influenced not only directly by the amount of siliceous dust present, but also indirectly by the high temperatures and high humidity underground together with lack of adequate ventilation. The scope of the underground investigation was therefore extended to include these and any other factors that might affect the health of the miners.

An office for the physical examination of miners was established in the central part of Butte, in cooperation with the Butte Antituberculosis Society. About 1,000 miners have been examined during the year. Statistics of these examinations have not yet been compiled, but it appears that miners' consumption is prevalent, though clinically it does not seem to be as aggravated in form as that seen in the Joplin district. Visiting nurses are employed by the Butte Antituberculosis Society, and these in the course of their work record the living and housing conditions among miners' families. It is expected later to combine with this public health and antituberculosis work the activities of the school nurses and the medical supervision of school children.

HEALTH INSURANCE.

The investigation of health insurance was continued by Surg. B. S. Warren and Statistician Edgar Sydenstricker. In addition to the study of existing and proposed health-insurance systems, collection of data from establishments operating sick benefit funds was continued. The work for the year was planned after conferring with the Commissioner of Labor Statistics, Department of Labor, in order to avoid duplication of activities, and during the year frequent conferences were had with Mr. Boris Emmet, assigned to this work by the Commissioner of Labor Statistics.

Data have been collected from about 622 establishments. Of these, 450 paid cash benefits only, 147 furnished medical and surgical relief, and 25 combined the two. Attention has been centered on the first group.

Owing to the fact that the health-insurance systems proposed in this county provide for a waiting period of three days, tabulations have been completed for all of the funds which had this waiting period. Nineteen such funds were found, 15 of which reported for the three-year period 1914–1916. The funds had an average of about 215,000 employees with a membership of about 155,000. Membership was not compulsory. The results appear in the following table:

Benefit associations having a three-day waiting period before cash benefits are paid—Summary for the three years 1914, 1915, and 1916.[1]

Number of companies reporting.	Average number of employees per year.	Average number of members per year.	Cases of sickness.	Case rate per 1,000 members.	Days of sickness.	Days per sick member.	Days per member.
19	636,239	460,805	219,102	475	3,999,020	18.25	8.68

[1] The days of sickness are the totals for three years. The membership is the sum of the averages for each year. The approximate number of persons can be obtained by dividing the total membership by 3.

About 90 per cent of the membership shown in the above table was among funds which limited their benefit period to 52 weeks. Where it was possible to ascertain the proportion which the amount of benefit paid bore to the wage it was found that the cash benefit ranged from one-half to one-third of it.

The results of this study have been very encouraging, the cooperation of all the establishments, except one, being most gratifying. When the desirability of continuing the collection of the data along more intensive lines became apparent, proposals in this respect were made to several of the establishments, and their physicians promised cooperation. Accordingly plans have been prepared for the collection of morbidity and mortality statistics of industrial establishments willing to cooperate with the service. It is proposed to secure from such establishments information relating to the age, sex, and occupation of all employees, and the cause, date of onset, length of disability, and result of all sickness and nonindustrial accidents occurring therein.

Public Health Organization and Administration.

SURVEYS.

In cooperation with State and local health authorities, studies of the organization and administration of health departments were continued. Surveys were made by Surg. Carroll Fox in the city of Birmingham and the county of Jefferson, Ala.[1], the State of Colorado,[2] South Bend, Ind.,[3] Piqua[4] and Springfield,[5] Ohio, Quincy, Ill.,[6] and Richmond, Va.,[7] and by Surg. G. B. Young in the cities of Kansas City, Mo., and Charlotte, N. C. Detailed recommendations were made to the authorities in the course of the surveys, and either the final report of the studies was published or a typewritten copy of it was submitted to the authorities. In addition to the surveys a special study of county health orgainzation is being conducted in Edgecombe County, N. C.

So far systematic studies along this line have been made in the following States:

Colorado.	Maryland.	Nevada.
Florida.	Massachusetts.	North Dakota.
Illinois.	Minnesota.	Washington.
Kansas.	Nebraska.	West Virginia.

and in the following cities:

Baltimore, Md.	Kansas City, Mo.	St. Joseph, Mo.
Birmingham, Ala.	Lexington, Ky.	St. Paul, Minn.
Bowling Green, Ky.	Minneapolis, Minn.	South Bend, Ind.
Charlotte, N. C.	Piqua, Ohio.	Springfield, Ohio.
Chicago, Ill.	Quincy, Ill.	Toledo, Ohio.
Columbia, S. C.	Richmond, Ind.	Winston-Salem, N. C.
Hopewell, Va.	Richmond, Va.	Youngstown, Ohio.[8]

[1] Report published. (Reprint 375 from Public Health Reports.)
[2] Report published. (Reprint 383 from Public Health Reports.)
[3] Report published in Public Health Reports of May 25, 1917.
[4] Report published in Public Health Reports of June 22, 1917.
[5] Report published. (Reprint 417 from Public Health Reports).
[6] Report published. (Reprint 427 from Public Health Reports).
[7] Places are listed in the order in which the surveys were made. The survey of Richmond, Va., was discontinued before completion owing to the detail of Surg. Fox as sanitary adviser to the Surgeon General's office, Navy Medical Corps.
[8] See p. 44 for list of counties and cities where brief surveys were made in connection with the special study of county health organization in Edgecombe County.

A large amount of data as to laws and ordinances governing health departments, organization of such departments, epidemiological activities, methods as to registration of births and deaths, sewage disposal, water supply, administration of laboratory, medical inspection of schools, communicable disease activities, food inspection, and appropriations and finances have been secured. Knowledge of existing conditions in regard to these matters enables the service officers to point out to each State or city surveyed what improvements in public health organization and administration will be productive of the best results. Emphasis is laid on two fundamental necessities: (1) the employment of properly qualified, full-time health officers for every community, whose term of service should depend upon their efficiency; (2) appropriations sufficiently large to conduct efficient health work. Included in each report are a number of recommendations dealing with specific problems presented by the situation in the State or city surveyed. The information obtained has been of assistance to the service in surveys of cities near cantonment areas (see p. 17).

STUDY OF COUNTY HEALTH ORGANIZATION.

For the purpose of working out principles of public health organization and administration which are feasible of adoption in county or municipal public health work, Asst. Surg. K. E. Miller was detailed to make a study of county health work in Edgecombe County, N. C., serving in the capacity of acting health officer.

Surveys of local health organization and administration.—Asst. Surg. Miller commenced his study on January 3, 1917, and before going to Edgecombe County, made brief surveys of the following counties, in some cases studying also municipal health organization: Norfolk, Va.; Walker and Tuscaloosa, Ala.; New Hanover, Robeson, Guildford, Davidson, Vance, Wilson, and Durham, N. C.; Greenville and Richland, S. C.; and Jefferson and Mason, Ky. It was found that one of the greatest hindrances to the efficiency of the health officer's work was the almost universal lack of office help and office régime. A large amount of data was obtained which was later found applicable to the situation in Edgecombe County. An attempt was also made to obtain expressions of opinion as to cooperation in health work between the county, State, and Federal authorities.

Preliminary survey of Edgecombe County.—A preliminary survey in Edgecombe County indicated that the county from the standpoint of health organization and administration was average, but that there was a stronger sentiment in this county than in many others for progressive health work. It was found that the matter of quarantine constituted an emergency and that in general the problems were the same as those of counties similarly located.

Intensive study in Edgecombe County.—The county health work under Asst. Surg. Miller was begun about March 1, 1917. The bulk of the work up to the end of the fiscal year was educational, 50 public meetings having been held, with a total attendance of over 1,500 people, 45 articles supplied to newspapers, several thousand letters sent to individuals, and two baby welfare weeks held, one for the

white and one for the colored. A new set of health laws for the county was drawn up and adopted, their enforcement meeting with a satisfactory degree of success. Clean-up campaigns were conducted in four of the five principal towns in the county. This work will be continued, special emphasis being placed upon quarantine of diseases, school inspection, hygiene and sanitation, and educational work in the county.

COOPERATION WITH INDIAN SERVICE.

As in the past, examinations of specimens to aid in the diagnosis of communicable disease have been made at the service laboratories for physicians of the Indian Service. The work includes ordinary examinations and tests of a bacteriological nature.

Antityphoid vaccine is furnished through the Hygienic Laboratory to the Office of Indian Affairs on request.

COOPERATION WITH HAWAIIAN AUTHORITIES.

A great deal of field and laboratory work has been performed at the leprosy investigation station for the Hawaiian authorities, among which may be mentioned examination of a large number of leper suspects and of 1,734 persons arriving from the Orient to see if they were infected with the spirullum of cholera; examination of samples of blood for Wassermann or Widal reactions, swabs for diphtheria, samples of condensed milk and carbonated water supposed to have caused outbreaks of disease; investigation of typhoid fever outbreaks at Honolulu and Hilo and an outbreak of anthrax among beef cattle at different points on the islands; inspection of a large area of wet lands near Honolulu as to its effect on health; and cooperation in drawing up a revised code of sanitary laws for the Territory.

COOPERATION WITH PORTO RICAN AUTHORITIES.

At the request of the governor of Porto Rico, Surg. W. W. King was detailed on September 20, 1913, for duty with the Institute of Tropical Medicine and Hygiene of Porto Rico. This detail was in addition to his duty as chief quarantine officer for Porto Rico.

The institute is an organization of the Government of Porto Rico for the study of diseases of that country and climate, and is composed of physicians with special experience in such lines.

Skin diseases.—Dr. King has continued his studies on tropical skin diseases, and an article entitled "Some observations upon the skin diseases of Porto Rico," published in the July, 1917, number of the Journal of Cutaneous Diseases, deals with this subject.

Dengue.—Two articles on dengue have been published in the New Orleans Medical and Surgical Journal, February, 1917, entitled "The epidemic of dengue in Porto Rico, 1915," and "The clinical types of dengue in the Porto Rico epidemic of 1915." Further studies on dengue, particularly dealing with certain blood changes, are in progress but not yet completed.

Some data have been collected on such diseases as malaria, filariasis, meningitis, intestinal infections, etc.

ASSISTANCE TO HEALTH AUTHORITIES OF KENTUCKY AND MISSISSIPPI.

At the request of the State health authorities of Kentucky, Passed Asst. Surg. H. E. Hasseltine was detailed on February 17, 1917, to confer with these authorities and to give advice in regard to the inauguration of a State-wide system of Wassermann examinations in the bacteriological laboratory of the State board of health. Dr. Hasseltine was at the laboratory of the State health authorities, Bowling Green, Ky., on February 26 and 27, and from March 12 to 17.

On request of the State health authorities of Mississippi, Dr. Hasseltine was directed, while on the same detail, to advise with them in regard to the manufacture of typhoid vaccine. He gave instruction to the laboratory force of the Mississippi Hygienic Laboratory in the manufacture and testing of typhoid vaccine from March 1 to 11. During this time one lot was made under his personal supervision, and sterility and potency tests were commenced. At the present time, the entire output of the State laboratory is tested by the Hygienic Laboratory of the service before release, thus providing a central check on this activity.

SANITARY SURVEY OF ESTABLISHMENTS UNDER NAVY AT CHARLESTON, W. VA.

On request of the Navy Department, a sanitary survey of Charleston, W. Va., was made, with special reference to the armor plant and other establishments under the Navy. Comprehensive reports, with recommendations, were made to the Navy Department, covering in particular water supply, sewerage, sanitary administration, milk and food supplies, communicable diseases, vital statistics, housing, and conditions in territory around Charleston. The study was undertaken by Epidemiologist A. W. Freeman, following an investigation of typhoid fever at this place (see p. 36), and at the end of June, 1917, Prof. E. B. Phelps was detailed to make a study of the water supplies and sewage disposal in relation to the proposed establishments of the Navy. This latter study was likewise the subject of a full report, copy of which was submitted to the Secretary of the Navy.

School and Mental Hygiene.

Extensive investigations of school and mental hygiene were continued under the direction of Surg. Taliaferro Clark, and the year was marked by an increasing popular interest in the supervision of the physical and mental health of school children, as indicated by requests for information or for assistance in making surveys. Furthermore, physical defects found among men called to the national defense have served to emphasize the need for such surveys by showing that the defects observed among children in the course of these surveys have to a large degree remained uncorrected. Increasing attention is being given to the high percentage of feeble-mindedness and the considerable number of insane or potentially insane children without intelligent mental prophylaxis.

BOSTON PSYCHOPATHIC HOSPITAL.

On invitation of the director, an officer was detailed to make, during July and August, 1916, a study of the methods of diagnosis, treatment, and prevention of mental disorders practiced in the Boston Psychopathic Hospital, in order to adopt such of them as were applicable to the work of the service. It is felt that advice, discipline, and training suitable to the needs of children potentially insane will save many of them from an ultimate mental breakdown, if such cases are recognized during school age, and that advantage should be taken of every opportunity to study the methods of other agencies concerned in mental prophylaxis.

MENTAL STATUS OF INMATES OF FOUR COLORADO INSTITUTIONS.

On request of the Colorado Survey Committee of State Affairs and the Colorado Committee on Provision for the Feeble-minded, a mental examination of the inmates of four State institutions was made by the service during August and September, 1916.

State institution for mental defectives.—Of the 80 inmates of this institution, 28 boys (68 per cent) and 24 girls (61 per cent) were found to be of such low mental development that neither educational or vocational training could be successfully applied to them.

State industrial school for girls.—Of the 119 girls in this institution, 18 (15.1 per cent) were retarded and 9 (7.55 per cent) were definitely feeble-minded.

State industrial school for boys.—Of the 274 boys examined in this institution, 73 (23.7 per cent) were found to be retarded and 25 (9.1 per cent) feeble-minded.

State home for dependent and neglected children.—Of the 250 inmates of this institution, 23 were retarded and 21 feeble-minded. Six exhibited characteristics of mental maladaptation which, if uncorrected, would later result in antisocial reactions.

Conclusion.—These investigations have shown that Colorado has not made adequate provision for the care and training of mental defectives.

MENTAL AND PHYSICAL STATUS OF SCHOOL CHILDREN IN NASSAU COUNTY, N. Y.

On request of the New York State health and educational authorities, the service conducted from October through December, 1916, a survey of the mental condition of selected groups of school children in Nassau County, N. Y., as a part of a general mental survey undertaken by the National Committee for Mental Hygiene. A study of the physical condition of this group and of the sanitation of the schools attended by them was included.

Of the 1,309 boys and 1,191 girls examined in 12 schools, 23 boys and 16 girls (1.56 per cent) were feeble-minded; 8 boys and 2 girls exhibited mental maladaptation and antisocial tendencies; 1 boy and 1 girl exhibited well defined psychotic symptoms; 1 girl was epileptic; 12 boys and 2 girls were probably feeble-minded; and 59 boys and 57 girls (4.6 per cent) were mentally retarded.

Uncorrected and, in some instances, unrecognized physical defects were observed in such numbers as further to strengthen the impression created in the course of similar surveys that the part-time medical services of a practicing physician are inadequate properly to supervise the health of any large body of school children.

HEALTH ADMINISTRATION IN PUBLIC SCHOOLS OF FRAMINGHAM, MASS.

On request of the local school authorities, an investigation of health administration in the public schools of Framingham, Mass., was conducted during February, 1917. These studies, advisory in character, were principally for the purpose of securing to the community, through improved methods, a maximum benefit from health supervision of school children. Specific recommendations were made to the authorities and adopted practically in toto.

MENTAL AND PHYSICAL STATUS OF RURAL SCHOOL CHILDREN IN DELAWARE.

New Castle County.—The studies of the mental status of rural school children in New Castle County, begun in 1916,[1] have been supplemented by a physical examination of the children in these schools and a sanitary survey of the buildings occupied by them. During the survey, January 1 to April 10, 1917, 3,115 rural school children were examined physically and the sanitary condition noted in the case of 95 rural school buildings, containing 155 classrooms.

Sussex County.—The investigation of the prevalence of feeble-mindedness in the school population has been extended to Sussex County.

One hundred and fifty four white and 32 colored schools were visited. Of the 6,004 white children inspected, 46 boys and 21 girls (1.1 per cent) were feeble-minded, and of the 855 negro children inspected, 13 boys and 16 girls (2.95 per cent) were feeble-minded.

Of 67 feeble-minded white children recorded 9 boys and 1 girl (6.7 per cent) had been "placed out" in Delaware homes by outside agencies. This practice has resulted in a material increase in the number of feeble-minded children in the county, the potential results of which may be of far-reaching and disastrous effect, and shows the necessity for the determination of the mental and physical status of such children prior to commitment to private homes.

MENTAL STATUS OF INMATES OF COUNTY ALMSHOUSES IN DELAWARE.

Sussex County Almshouse.—A study to determine the mental status of the inmates of Kent and Sussex County almshouses was undertaken to show primarily the need of a special institution for the care of the feeble-minded. Incidentally these studies likewise show a distinct relationship between dependency and feeble-mindedness. Of the 36 inmates of this institution (21 white; 15 negro) but 3 were of normal mentality, 19 were feeble-minded, and 11 were insane. This institution is without modern equipment for the care

[1] Report published (Reprint 377 from Public Health Reports.)

of the sick. The inmates not only have irregular medical attention, but are practically without supervision.

Kent County Almshouse.—Of 18 white males, 5 were feeble-minded; of 12 white females, 7 were feeble-minded; of 8 negro males, 4 were feeble-minded and one doubtful; of 11 negro females, 9 were feeble-minded. Nine white adults were suffering from a psychosis. In other words, of 49 inmates only 14 were normal mentally. The sexes were segregated in this institution, and some attempt to supervise them was observed in the employment of a matron. There are no modern facilities for the treatment of the sick.

The commitment of the insane and the feeble-minded to county almshouses is a relic of the dark ages and should not be tolerated in any enlightened State.

COMMUNITY INVESTIGATIONS OF FEEBLE-MINDEDNESS, SUSSEX COUNTY, DEL.

Supplementing investigations of mental status of rural school children in Sussex County, Del., the service has diagnosed cases of suspected feeble-mindedness observed by the Children's Bureau in their social survey of the general population of this county. Eighty white families were visited and 110 suspected feeble-minded persons examined, of which 85 (77.2 per cent) were definitely feeble-minded. Forty-two negro families were visited and 73 suspected feeble-minded persons were examined, of which 57 (78 per cent) were feeble-minded.

In this survey 0.4 per cent of the white population of the county was found to be feeble-minded, whereas in the school survey 1.1 per cent of the white-school population and 0.96 per cent of the general white population between 5 and 20 years of age were found to be feeble-minded. In the total negro population 1 per cent and between the ages of 5 and 20 years 1.9 per cent were found to be feeble-minded.

It was found that:

1. An examination of the school population was a satisfactory method for determining the prevalence of mental defectives in the county at large.
2. The percentage of feeble-mindedness in the school population approximated that in the general population from 5 to 20 years inclusive, where the school attendance was not less than 80 per cent of the total enrollment.
3. The percentage of mental defectives in a school population with an attendance of 80 per cent of the enrollment was double that of the general population.
4. The number of feeble-minded males was greater than that of feeble-minded females in both the school and the general population.

MENTAL STATUS OF BOYS OF NATIONAL JUNIOR REPUBLIC.

On request of the superintendent, mental examinations were again made (May, 1917) of boys admitted to the National Junior Republic, Annapolis Junction, Md. During the past three years 100 "citizens" of the republic have been examined, of which 25 per cent were

mentally retarded, 11 per cent feeble-minded, 4 per cent possibly feeble-minded, 3 per cent homosexual, and 6 per cent with psychopathic personalities. The unusually high percentage of feeble-mindedness observed in this school is due to the number of feeble-minded among the delinquents sent by the juvenile courts of Maryland and the District of Columbia. The former has inadequate facilities for the care of the feeble-minded, the latter none.

SANITARY SURVEY OF PUBLIC-SCHOOL BUILDINGS, MARLBORO COUNTY, S. C.

On request of the State board of health, a sanitary survey was made of the public-school buildings and grounds of Bennettsville, Clio, McColl, and Tatum, Marlboro County, S. C., April 30 to May 2, 1917. It was found that at all of the schools the grounds, though of ample size, were without apparatus and were utilized but little for regulated outdoor physical exercises. The heating and ventilation systems of the schools needed improvements, the toilet, privy, and lavatory facilities were unsatisfactory, and due regard for hygienic principles had not been observed in the equipment, decoration, and illumination of classrooms. Specific recommendations were made to the authorities.

MENTAL AND PHYSICAL STATUS OF CHILDREN IN PELLAGROUS COMMUNITIES.

In connection with pellagra studies in certain cotton-mill villages of Spartanburg County, S. C. (see p. 29), physical and mental examinations of the children in these communities were commenced (at Cowpens, Apr. 13, 1917) for the purpose of comparison with children of nonpellagrous communities, and to study the influence of dietary conditions on nutrition in children in pellagrous communities. By June 30, 1917, 2,534 children had been examined. For the purposes of publication, data from this investigation will be compiled in a report with similar data from other localities.

COOPERATION WITH MARYLAND STATE BUREAU OF LABOR AND STATISTICS.

In cooperation with the Maryland State bureau of labor and statistics, tests of mental development of children applying for permits for employment in industrial occupations were made by Surg. J. A. Nydegger from January 25 to May 15, 1917.

Rural Sanitation.[1]

INTENSIVE COUNTY SURVEYS.

Special studies of and demonstration work in rural sanitation were continued under the direction of Surg. L. L. Lumsden. The sanitary surveys of Floyd County, Ga., Greenville County, S. C., Obion

[1] See also "Disinfection of human excreta" in the report of the Hygienic Laboratory, p. 67.

County, Tenn., and Tuscaloosa County, Ala., referred to on page 67 of the last annual report, were completed during the year, and sanitary surveys were begun in Clay County, Miss., Cumberland County, Ill., Hill County, Tex., Okmulgee County, Okla., and Mason County, Ky. The work was completed in Clay and Cumberland Counties, but was still in progress in Hill, Okmulgee, and Mason Counties at the end of the fiscal year. The officers in immediate charge of the surveys were: Asst. Surgs. W. H. Slaughter, J. G. Townsend, K. E. Miller, H. C. Yarbrough, R. E. Wynne, and W. C. Witte, and Asst. Epidemiologist F. E. Harrington.

The plans for these surveys have been generally the same as in previous years, namely, visits to as many individual homes as possible; reinspections of a certain number of homes in different neighborhoods to find out the sanitary improvements carried out; delivery of lectures on sanitation; inspections of public buildings; securing the cooperation of civic organizations and prominent citizens; and, finally, surveys of the incorporated towns in the county and making specific recommendations to the authorities which will bring about sanitary disposal of excreta, prevention of fly breeding, and protection of food and water supplies. The ultimate purpose of the surveys is to awaken in rural communities an individual and communal interest in public-health questions which will in turn lead to an improvement in sanitary conditions and the maintenance of an efficient local health agency.

The scope of the surveys during the past fiscal year is indicated in the following table:

Data as to sanitary surveys of counties made during fiscal year 1917.

County.	Homes inspected.	Homes revisited.	Churches surveyed.	Railroad stations surveyed.	Schools surveyed.	Lectures delivered.
Floyd County, Ga.	319	2,614	3	.....	42	14
Greenville County, S. C.	1,249	2,160	22	6	17	23
Obion County, Tenn.	1,776	1,974	23	.....	26	20
Tuscaloosa County, Ala.	1,363	2,638	.....	.....	.....	40
Clay County, Mo.	4,495	1,808	45	26	51	49
Cumberland County, Ill.	3,298	1,192	58	8	77	53
Hill County, Tex.	10,441	787	127	18	123	107
Okmulgee County, Okla.	6,893	.....	16	5	14	75
Mason County, Ky.	1,790	.....	14	.....	6	14
Total	31,624	13,173	308	63	356	395

Marked progress in sanitary improvements was made in each of the counties in which the work was conducted. The results obtained in Hill County, Tex., as indicated by an inspection of the work made recently by Epidemiologist A. W. Freeman, form a good example of this progress. Dr. Freeman found that in the county seat, Hillsboro, the work of sanitation was practically complete and that nearly all the privies in the town had been rebuilt and made fly proof. In the other towns of the county, with one exception, the same results have been obtained. The ordinary open back insanitary privy, in practically universal use in the county prior to the survey, has been replaced by an excellent type of sanitary privy, properly screened and ventilated and capable of easy and satisfactory cleaning. Suitable

and efficient scavenger systems have been devised for the towns, and the danger of fly-borne typhoid fever has been reduced to a minimum. In the rural districts, also, improvement has been marked, and approximately one-third of the rural homes have already made improvements in their sanitary appliances. There has been real and permanent improvement in the general health administration of the towns and a very successful campaign of general education in sanitary matters. A full report of the work and its results in the 15 counties surveyed since the beginning of the special studies of rural sanitation in 1914 is in course of preparation. On the basis of experience gained in this work, a bulletin relating to a sanitary privy system for unsewered towns and villages was prepared by Surg. L. L. Lumsden and published as Public Health Bulletin No. 89.

SPECIAL STUDIES.

Besides the intensive surveys of counties some other special studies have been begun during the year and are still in progress. Asst. Surg. R. E. Wynne, assisted by a sanitary engineer of the Public Health Service, is making a sanitary survey of a group of rural towns in Wyoming. Prof. C. W. Stiles, Prof. E. B. Phelps and Surg. L. L. Lumsden with a number of assistants are making field and laboratory studies with a view of determining the feasibility of chemical treatment of privy contents so as to make the matter safe from a sanitary standpoint without decreasing its fertilizer value. In this phase of the work the main field studies are being made in New Hanover County, N. C., and the bacteriological and chemical work is being done at the Hygienic Laboratory.

Asst. Surg. K. E. Miller, acting as whole-time county health officer, is making a practical study of county health work in Edgecombe County, N. C. (See p. 43.)

Investigations of Pollution of Streams.

Extensive studies of the problems associated with the pollution of navigable waters were first begun by the service in 1913. Preliminary surveys were made of the Potomac River in January and work started on the Ohio River in July. The Ohio studies have been carried on with headquarters at Cincinnati, under the direction of Surg. W. H. Frost.

ORGANIZATION.

At the beginning of the 1917 fiscal year the following personnel was assigned to duty for stream-pollution studies at the headquarters' laboratory at Cincinnati: Five medical officers, 1 pharmacist, 1 epidemiologist, 1 special expert (biologist), 5 sanitary engineers, 3 sanitary bacteriologists, and 15 attendants. At the end of the year the force had been much reduced by transfers, resignations, and special details for health problems arising out of the military situation. The personnel then comprised 1 pharmacist, in temporary charge, 1 sanitary engineer, 4 sanitary bacteriologists, 1 special expert (biologist), 1 sanitary chemist, and 8 attendants, including the force engaged in special studies of industrial wastes.

OHIO RIVER.

As mentioned in previous annual reports, the object of these studies has been not only a study of pollution conditions as existing in the Ohio River, but more especially a quantitative analysis of the various factors concerned in the pollution and self-purification of streams in general. In addition to extensive and intensive laboratory investigations of the degrees and types of pollution, including exhaustive bacteriological, chemical, and biological (plankton) examinations, consideration was given to the coordination of these findings with the general status of public-health conditions in the communities situated on the main river and its tributary drainage systems. Comprehensive sanitary surveys have been made of all cities, towns, and communities of any importance located on the Ohio River watershed, with special reference to the effects of stream pollution upon public health. In computing the sanitary status of the communities thus studied on the basis of possible influence of stream pollution, the incidence of typhoid fever was taken as the most reliable index.

Laboratory investigations.—Extensive data have been collected and compiled from bacteriological, chemical, biological, and hydrometric studies covering the whole Ohio River and its main tributaries. All branch laboratories have been discontinued, and all work in connection with investigations of stream pollution conditions is being carried on at the headquarters' laboratory at Cincinnati. The examination of river samples from the Ohio was discontinued June 1, 1917. Since that date the laboratory work has been much curtailed.

In June, 1917, samples of both raw and treated water at the Fort Thomas Army post were examined at the request of the military authorities of the post. Examinations were also made of samples of water from private wells and public supplies from Maysville and Calhoun, Ky., to assist the work of survey parties detailed for rural-sanitation studies in these communities.

The results of the large numbers of examinations of samples have been carefully studied, compiled, and analyzed for the preparation of a full report.

Bacteriological studies.—In addition to routine bacteriological examinations, special studies have been made of the preparation of standard media and the perfecting of bacteriological technique with the view of simplifying routine water examinations and establishing a satisfactory basis for interpreting results.

Chemical studies.—In addition to the routine examinations of water samples for turbidity, alkalinity, oxygen demand, and sanitary and mineral analyses of composite samples, special studies have been carried on in the chemical laboratory.

Complete mineral analyses were made of samples of well waters collected in connection with studies of pellagra being carried on by Surg. Goldberger at Spartanburg, S. C.

Special research studies.—Studies begun during the previous year, by Asst. Surg. Joseph Bolten, on the life of bacteria in stored water samples, were continued and elaborated by Sanitary Engineer H. W. Streeter, in order more definitely to establish the fundamental growth and death rates of bacteria.

Special studies were undertaken by Sanitary Engineer Streeter and Sanitary Bacteriologist E. M. Meyer to establish the basic metabolic differences between fecal and grain types of *B. coli*, as a means of differentiating these two types of organisms. Although this work is left unfinished, satisfactory progress was made in checking up and elaborating upon the previous work of Rogers, Clark, and Lub of the United States Department of Agriculture. The importance of a differentiation between the fecal and nonfecal types of *B. coli* in the interpretation of the sanitary qualities of water supplies has already received considerable study.

A new laboratory medium for the isolation of *B. coli* was developed by Mr. Meyer and the results published in the Journal of Bacteriology, (Vol. II, No. 3, May, 1917), under the title, "The use of a three per cent lactose litmus agar plate for the demonstration of *B. coli* in water examinations."

An apparently new species of the *B. coli* group was also isolated by Mr. Meyer from samples of water under routine examinations. This organism culturally resembles members of the *B. coli* group, but is a spore-forming variety.

Plankton studies.—Special biological research was begun in October, 1916, by Plankton Expert W. C. Purdy and Sanitary Bacteriologist C. T. Butterfield, upon the food relations existing between bacteria and various animals of the plankton particularly the protozoa, in order to determine whether the activity of certain protozoa constitutes any appreciable factor in the destruction of bacteria. Large numbers of cultures, some of bacteria only and others containing both bacteria and protozoa, were studied over time periods varying from 18 to 200 days.

Results indicate (1) that certain protozoa can subsist on a diet of bacteria only; (2) that very large numbers of bacteria are devoured by protozoa; (3) that a definite and direct relationship exists between bacterial content and the native animal plankton of sewage; (4) that physical conditions improve most rapidly in cultures containing both bacteria and plankton.

The practical value of these studies lies principally in the demonstrated efficiency of the protozoa in reducing bacteria in sewage or polluted water, thus throwing new light on methods by which natural purification is effected.

Laboratory examinations.—The following is a summary of the laboratory examinations made during the year. As each sample often requires a series of examinations, the figures given usually represent the numbers of individual samples:

Bacteriological examinations: Routine river and tap samples	4,189
Chemical examinations:	
Turbidity determinations	4,056
Alkalinity determinations	1,667
Oxygen demand determinations	471
Sanitary analyses	977
Mineral analyses	11
Biological (Plankton) examinations:	
Special cultures of plankton	2,052
Special bacteriological examinations	2,117

Special examinations:	
Stored water samples	214
Industrial wastes samples	267
Reaction and hydrogen-ion determinations [1]	4,180
Quantitative determinations for dextrose [1]	154
Quantitative ammonia (Nessler) determinations [1]	418
Isolations of colon cultures [1]	2,190
Total counts (agar) [1]	148

ATLANTIC WATERSHEDS.

In order to assemble extensive data for comparative studies of various river systems the surveys made in New Jersey in 1915 were extended during 1916 to include the drainage areas tributary to the Atlantic Ocean in the State of New York and the New England States. Two field parties began work in May, 1916, the first consisting of Passed Asst. Surg. Paul Preble, and Sanitary Engineers J. K. Hoskins and H. R. Crohurst; party No. 2, Passed Asst. Surg. L. R. Thompson and Sanitary Engineers R. E. Tarbett and W. G. Stromquist. In June, 1916, Epidemiologist A. W. Freeman proceeded to Boston, Mass., for the purpose of compiling epidemiological data from the records of the State board of health, and later to Hartford, Conn., for the same purpose.

These surveys were conducted along the same general lines as those followed in the survey of Ohio River communities in 1914. Special attention was given to the usual factors responsible for the prevalence and spread of typhoid fever, including the effect of pollution of streams, and extensive data were collected on the character and extent of pollution of streams by industrial wastes.

Field studies were continued with interruptions until about September, 1917. Because of curtailment of the field parties on account of the epidemic of poliomyelitis in New York City and vicinity, the studies of the drainage areas of Maine and part of New Hampshire were left unfinished. Valuable data were collected for comparative studies of stream pollution effects, and public health organization and administration.

In June, 1917, similar surveys were started in the States south of the Potomac and east of the Mississippi Rivers. Field party No. 1, consisting of Passed Asst. Surg. Paul Preble and Sanitary Engineers J. K. Hoskins and H. H. Wagenhals, began work in Mississippi, and field party No. 2, consisting of Asst. Surg. H. F. Smith, Sanitary Engineer R. E. Tarbett and Scientific Assistant W. H. Price, proceeded to Tennessee. Epidemiologist A. W. Freeman and Sanitary Engineer H. R. Crohurst were to cover the States of Virginia and North Carolina in cooperation with Surg. H. S. Cumming, in charge of the investigation of the pollution of coastal waters.

The surveys in the southeast progressed until about July 1, 1917, at which time nearly the entire personnel were recalled for duty in connection with preliminary surveys of extra cantonment areas and the establishing of civil sanitary districts around military camps.

[1] Work in connection with differentiation of fecal and nonfecal *B. coli*.

COOPERATION WITH BUREAU OF IMMIGRATION.

On request of the Bureau of Immigration, Department of Labor, Sanitary Engineer R. E. Tarbett was detailed on May 7, 1917, to make sanitary surveys of proposed sites for internment camps. Such surveys were made in company with the Assistant Commissioner General of that bureau at the following places: Pisgah Forest Preserve, Lake Toxaway, Waynesville, Hot Springs, and Hendersonville, N. C.; and property in two counties, York and Kershaw, S. C. Reports were furnished to the Bureau of Immigration.

DIGEST OF JUDICIAL DECISIONS RELATING TO STREAM POLLUTION.

In connection with the field studies of stream pollution, a digest of court decisions relating to the subject and an analysis of the trend of these decisions was prepared by Research Attorney Stanley D. Montgomery under the supervision of Prof. E. B. Phelps and is being published as Public Health Bulletin No. 87. The bulletin includes a compilation of legislation relating to stream pollution.

WATER SUPPLY, CALHOUN, GA.

On request of the mayor, Asst. Surg. W. H. Slaughter was detailed on August 3, 1916, to conduct an investigation of the public water supply of Calhoun, Ga. Recommendations were made to prevent further pollution of the water supply, but it was pointed out that the danger from such pollution was not so great as the danger from insanitary privies in sections not supplied by the city water.

QUALITY OF DRINKING WATER SUPPLIED CUSTOMHOUSE, BOSTON.

On request of the Department of Commerce, Passed Asst. Surg. Wm. M. Bryan was detailed to investigate the drinking water supplied the customhouse at Boston. The source is the city mains. The supply was found to be entirely satisfactory, but it was recommended that the storage tanks in the customhouse should be cleaned at more frequent intervals.

WATER SUPPLY OF CHEVY CHASE CLUB, MARYLAND.

On request of the club, recommendations were made by Sanitary Engineer Leslie C. Frank for improving the water supply of the Chevy Chase Club, Maryland.

WATER SUPPLY IN CITIES IN OKLAHOMA.

On request of the local authorities, Sanitary Engineer H. W. Streeter was detailed to review a plan for a water supply extension at Okmulgee, Okla. A report containing conclusions reached was sent to the authorities. On request of the corresponding authorities in Beggs, Dewar, and Henryetta, studies were made in June, 1917, of proposed water supplies in these cities by Sanitary Engineer H. R. Crohurst.

Pollution of Coastal Waters.

The investigation of the pollution of coastal waters with special reference to the interstate spread of disease was continued under the direction of Surg. H. S. Cumming.

CONNECTICUT.

An intensive study of the coastal waters of Connecticut, especially of the shellfish areas and bathing beaches in New Haven Harbor and outside the harbors of Bridgeport and South Norwalk, was begun during the latter part of May, 1916, and continued until December, 1916. The study was made in cooperation with the State and municipal authorities, and the results furnished to them.

The facilities of laboratories at Yale University were courteously extended and used by the field party until the arrival of the newly acquired laboratory steamer *Murray* in October.

In the case of the New Haven harbor study attention of the health authorities was directed to the gross pollution of the harbor and the consequent danger of the spread of water-borne diseases through use of the shellfish and bathing beaches. Accordingly the health authorities forbade the taking of shellfish for food from polluted areas and the city made an appropriation for the purpose of experimental studies as to the best method of sewage disposal.

JAMAICA BAY.

The investigation of the pollution of Jamaica Bay was completed in March, 1917. The study was made under the immediate direction of Asst. Surg. F. A. Carmelia, assisted by Asst. Sanitary Engineer Pincus. Through the courtesy of Dr. Carl Alsberg, Chief of the Bureau of Chemistry, United States Department of Agriculture, the laboratory of the Bureau of Chemistry in New York City was utilized until the arrival of the laboratory steamer toward the end of December.

The investigation included: (*a*) Intensive studies of the pollution entering the bay; (*b*) float studies of the dissemination of this pollution by tidal and other currents; (*c*) intensive bacteriological study of the waters of the bay; (*d*) chemical study of the seasonal and tidal variations in the quantity of dissolved oxygen and chlorine present; (*e*) bacteriological study of the sanitary condition of shellfish; (*f*) epidemiological study of the area bordering Jamaica Bay with special reference to typhoid fever.

The bay, especially the northern half, was found heavily polluted at all times and almost twice as polluted in the summer as in the winter. The sewage treatment plants on the bay were found to be of obsolete design, very ineffectively operated, overloaded from 200 to 500 per cent, and not discharging satisfactory effluents. Much of the sewage is discharged without treatment. These facts are specially important since cases of typhoid fever were found to be present at all times in areas covered by these sewer systems. The shores of the bay are therefore unsafe for bathing, and the raw consumption of oysters

taken from the bay, or the marketing of oysters without preliminary purification is liable to spread disease.

A careful examination of the epidemiological data of the city of New York shows that a significant part of the yearly typhoid cases of that city are laid to infection by oysters. A large proportion of the oysters supplied to the New York market come from Jamaica Bay.

NARRAGANSETT BAY.

In May an investigation of the coastal waters of Narragansett Bay and vicinity was begun. The scope of the investigation has been necessarily restricted as a result of the war.

LABORATORY STUDIES.

The experimental studies at the temporary field laboratory on Fisherman's Island Quarantine Station were continued until December, 1916, when the laboratory was closed. These studies were chiefly directed toward the determination of the disappearance rate in sea water of the typhoid organism and colon bacillus and the viability of these organisms in shellfish as ordinarily cooked. Important studies were also made as to the practicability of the purification of oysters through the use of hypochlorite of lime or chlorine gas when it is not practicable to remove them to nonpolluted areas for purification.[1] The practicability of using the method on a commercial scale was demonstrated in Jamaica Bay and in New Haven harbor.

SANITATION OF SHELLFISH INDUSTRY.

During the year the medical officer in charge of the investigation of coastal waters has been in conference with various State authorities with reference to improvement in the sanitation of the shellfish industry.

Industrial Wastes.

Studies of tannery, strawboard, creamery, and canning wastes were continued under the general direction of Prof. E. B. Phelps, Chief of the Division of Chemistry, Hygienic Laboratory.

TANNERY WASTES.

The plant at Luray, Va., previously devised for the treatment of tannery wastes, was continued in charge of an attendant until March, 1917, to obtain continuous records of operation. At this time arrangements were completed for the construction of a large-scale working plant, several companies having agreed to pay the cost. Detailed construction plans and specifications were prepared under the direction of Sanitary Chemist H. B. Hommon. The plant was placed in operation in June. By an arrangement with the tanning companies the service will continue to have charge of the operating details long enough to demonstrate the utility of the system.

[1] A preliminary report in regard to this investigation was published in the Public Health Reports of July 14, 1916 (Report 351), and a more exhaustive report has been prepared for publication.

To study at closer range and in more detail certain special problems connected with the treatment of tannery wastes and to check the results obtained at Luray an experimental plant has been operated at the tannery of Haffner Bros., Cincinnati. It has been determined that the system of treatment found suitable at Luray would apply, with minor modifications, to many other tanneries.

On request of the State and local authorities Sanitary Chemist H. B. Hommon was detailed on May 9, 1917, to make a survey of the disposal of tannery wastes in conjunction with the city sewage at the municipal disposal plant at Harrisonburg, Va. A report with recommendations was made to the authorities.

STRAWBOARD WASTES.

At the completion of experimental studies of strawboard-waste treatment at Noblesville, Ind., plans for a large unit were undertaken. Owing to legal complications in which the service had no part this work was temporarily suspended in March, 1917. To bring the study of this subject to an end and determine how far the results at Noblesville were applicable to strawboard plants in general an extensive survey of such plants throughout the Middle Western States was undertaken. In particular data were obtained upon the output of the mill, the amount of waste liquor and its chemical composition. This investigation has been concluded and the results prepared for publication.

CREAMERY WASTES.

The plant constructed during the previous fiscal year at Grove City, Pa., in cooperation with the Dairy Division, Bureau of Animal Industry, United States Department of Agriculture, has remained in continuous operation. A successful method of treatment of creamery wastes has been developed and a satisfactory solution found for one of the most difficult problems of industrial waste disposal.

CANNING WASTES.

The plant at Amelia, Ohio, constructed in the early summer of 1916, was operated continuously during the short canning season, August to November, inclusive, 1916. Results of a very satisfactory nature were obtained upon the wastes resulting from tomato canning.

LABORATORY STUDIES.

The work of the laboratory at Cincinnati has been confined in the main to the routine examination of industrial wastes and effluents from the various experimental plants. A considerable amount of analytical data has been brought together which will prove of value in the general discussion of stream pollution problems as well as in connection with the specific studies of industrial waste disposal. Sanitary Engineer E. J. Theriault, under Mr. Hommon's direction, is carrying out a special research upon the difficult problem of determining and expressing the biological oxygen demand of these wastes.

Sewage Disposal.

Investigations of sewage disposal have been under the general supervision of Prof. E. B. Phelps of the Hygienic Laboratory and the immediate direction of Sanitary Engineer L. C. Frank.

RESIDENTIAL AND SMALL COMMUNITY SEWAGE.

Experiments in regard to residential and small community sewage have been carried out at two experimental plants, one located at Chevy Chase, Md., and the other at the Hygienic Laboratory. Special attention has been given to a study as to wherein this problem differs from that of sewage disposal in large cities. Various modifications of well-known and successful processes of treatment of city sewage have been tried experimentally. Many of these have been found wholly unsuited to the problem in hand, while others have shown themselves adaptable with modification. Excellent results have been obtained from the lath filter, a modification of the ordinary trickling filter, when provided with special apparatus for distribution. It is now believed that this process will be applicable to almost all practical conditions, and will be capable of operating with a minimum of attention and expense. The results of this investigation, which has been carried on continuously for about three years, are being prepared for publication.

STERILIZATION OF STEAMBOAT WASTES.

The steam disinfector previously installed on the lake steamer, *D. G. Kerr*, was continued in operation throughout the summer and fall of 1916. Bacterial examinations were made during frequent trips of inspection and under varied conditions of temperature and weather. In all cases the results were entirely satisfactory. They were confirmed by an examination of samples by the bacteriologist of the Detroit city board of health. A report of this investigation is being prepared for publication.

STUDIES OF SEWAGE DISPOSAL IN CITIES IN OKLAHOMA.

On request of the local authorities, Sanitary Engineer H. W. Streeter was detailed to review a plan for a sewage-disposal extension at Okmulgee, Okla. A report containing conclusions was sent to the authorities. On request of the corresponding authorities in the cities of Beggs and Henryetta, studies were made of sewage-disposal systems at these two places.

Treatment for Drug Addiction.

In cooperation with the Conference on Drug Addiction, Surg. E. H. Mullan conducted in June, 1917, an investigation of a therapeutic method for lessening or eliminating the symptoms which ordinarily occur when drug habituaries are deprived of their drug. The studies consisted of observations of patients under usual treat-

ment and under the treatment evolved by Dr. C. F. Stokes, former Surgeon General, United States Navy. The observations were not complete enough to justify final conclusions, but it appeared that the patient who had undergone the Stokes treatment was stronger, more comfortable physically, and more contented at an earlier period than the patient who had received the usual treatment.

Cooperation with Bureau of Chemistry.

Cooperation with the Bureau of Chemistry, Department of Agriculture, was continued, Surg. M. V. Glover being detailed to that bureau as in the previous fiscal year for the enforcement of the Sherley amendment to the food and drugs act of 1906. This is an excellent example of useful cooperation on the part of the two bureaus.

Leprosy Investigation Station.

Investigations of leprosy have been continued at the leprosy-investigation station, Honolulu, Hawaii, under the direction of Surg. D. H. Currie. The personnel of the station remained practically unchanged during the year.

LABORATORY STUDIES.

The more important of the studies conducted at the station may be thus summarized:

1. Attempts to cultivate an acid-fast bacillus, morphologically identical with the bacillus of leprosy, have been continued, and similar work has been done in connection with the bacillus of rat leprosy, an analogous organism.
2. Uniformly unsuccessful attempts have been made to convey the disease to some of the lower animals. With every year of experience it becomes more certain that leprosy is a strictly human disease.
3. A number of experiments were conducted on tubercular rabbits and guinea pigs with a copper cyanide compound manufactured in Japan by Prof. Koga. As it appeared that the preparation was without appreciable curative value for tuberculosis, it was not considered advisable to administer it to lepers.
4. Experiments to ascertain why iodin and its salts brought about the softening of the nodules of lepers, accompanied by the appearance of new nodules, were conducted.
5. Experiments on the complement deflection tests, using the blood of the lepers under the care of the station, were continued.
6. A number of tests were performed to ascertain the degree of permeability of the kidneys of lepers in comparison to the kidneys of normal persons.
7. A series of experiments to ascertain what became of acid-fast bacilli when injected into the circulating blood of rabbits were conducted. It was found that they were gradually filtered out by the viscera.

In addition to the studies Widals and Wassermann tests were made and other work done at the request of the chief quarantine officer of the service, several articles were prepared for publication, the photographs of 94 lepers were collected, and a large amount of work was done for the Territorial government.

CLINICAL STUDIES.

In addition to routine relief furnished to the patients at the station and at the branch at Kalihi, a number of substances were employed in the treatment of leprosy in an experimental way. Among these may be mentioned the use of chaulmoogra oil hypodermically (Heiser's formula); the use of chaulmoogra oil containing iodin in chemical combination (Currie's and Hollmann's formula) by hypodermic administration; the administration of Koch's old tuberculin and the analogue of Koch's old tuberculin, prepared from the acid-fast bacilli isolated from the nodules of lepers by the method of Clegg. For the first time in the recorded history of the treatment of this disease, several cases of leprosy were placed on the form of treatment commonly employed in the treatment of pulmonary tuberculosis—rest in bed in the open air and forced feeding. No beneficial results were observed from any of the above treatments except in the case of chaulmoogra oil.

Hygienic Laboratory.

GENERAL REMARKS.

Personnel.—Surg. G. W. McCoy has continued as director of the laboratory. At the end of the fiscal year the personnel consisted of the director, assistant director, 7 surgeons, 3 passed assistant surgeons, 4 assistant surgeons, 3 professors, 2 pharmacists, 6 technical assistants, 1 artist, 1 sanitary chemist, 1 organic chemist, 4 sanitary bacteriologists, 1 sanitary engineer, 1 assistant sanitary engineer, 2 special experts, 4 laboratory aids, and 36 attendants, a total force of 78. There has been one death among the personnel, that of Dr. Martin I. Wilbert. One case of typhoid fever due to accidental infection in the line of duty developed.

Instruction.—The course of instruction was again given to 10 commissioned officers, and covered a wide field of public health and laboratory work. Informal discussion and criticism were encouraged at all times. The medical bureaus of the Army and Navy and the scientific bureaus of the Department of Agriculture detailed lecturers for the course, and several eminent scientists outside the Government services addressed the class and the laboratory staff.

A number of research workers not connected with the service were granted the facilities of the laboratory during the year. Among these should be mentioned Dr. J. W. Penfold, director of the Government serum laboratories, Melbourne, Australia; Dr. S. M. Woo, of Pekin, China; Dr. F. C. Yen, Changsha, China; and Dr. Solliway, of Providence, Wash.

Inventions and apparatus.—From time to time necessity has arisen for apparatus particularly adapted to the laboratory needs. At such times the idea has been worked out by some member of the staff and the detailed drawings turned over to the mechanical personnel for construction. Chief among these pieces of apparatus has been device designed by Surg. Stimson for making multiple inoculations of culture media. By means of this machine 15 inoculations may be made simultaneously. The machine is in practical use in connection with the testing of disinfectants.

Aid to other branches of Government.—Aid has been extended to various branches of the Government outside the Public Health Service. This aid has covered a wide field, ranging from routine water examinations to matters of an advisory nature involving policies to be carried out.

Aid from other branches of Government.—Mention should be made of numerous instances in which other branches of the Government have contributed to the routine work of the laboratory. For instance, the libraries of the Capital kindly loaned their scientific books and the Zoological Park has been of material assistance in housing and caring for a large number of stock monkeys.

Need of hospital connections.—The serious handicap of the lack of clinical facilities in connection with the laboratory has never been more acutely felt than during the past year. In studies of both poliomyelitis and epidemic meningitis, it has been necessary to depend on casual opportunities to secure material.

Library.—The total number of bound volumes in the library at the end of the fiscal year was 7,056, 423 having been received during the year. There were 2,288 books issued, not taking into account the books and periodicals constantly in use within the library proper. Of the books issued, 1,367 were borrowed from other libraries, 728 from the library of the Surgeon General's Office, 362 from the library of the Department of Agriculture, 235 from the Library of Congress, and the rest from various department libraries in Washington. A few volumes have been loaned to other libraries. There have been received 1,007 pamphlets, etc., from official sources and 4,883 from other sources. Many of these have been classified and catalogued. From the Library of Congress, 3,831 printed cards have been received, making a total of 18,528 printed cards now in the catalogues. In addition, 5,073 typewritten cards were prepared and added to the catalogue.

At the beginning of the calendar year, through a subscription to a clipping bureau, an effort has been made to secure authentic information with reference to poisoning cases reported in the public press. From January 1 to June 30, 1917, some 952 clippings were received, and, based upon these, 707 reports of poisoning cases have been received from physicians, hospital and police officials, and others.

DIVISION OF PATHOLOGY AND BACTERIOLOGY.

Poliomyelitis.—The epidemic of poliomyelitis in New York and vicinity last year, which the service investigated, threw a large amount of work on the division of pathology and bacteriology, where the laboratory studies were conducted. These studies have been carried on almost continuously throughout the fiscal year, supple-

mented by material and data collected in an epidemic in West Virginia which occurred in the winter of 1916–1917.

The studies have consisted chiefly of attempts to produce the disease in animals other than the monkey and of efforts to cultivate the specific organism. The results have been substantially negative.

Investigations have thrown no light, other than that of a negative nature, upon the possible relationship between paralytic diseases of domestic animals and epidemic poliomyelitis.

Rocky Mountain spotted fever.—Studies of this disease have been conducted in conjunction with field investigations in the West under Surg. Fricks. Various attempts to grow the organism and to inoculate a calf and a sheep with the virus of spotted fever, with the object of preparing a curative serum, have given negative results.

Plague.—A number of cultures isolated from rats diagnosed as plague infected by service officers stationed at the plague laboratory at New Orleans were referred for study and verification morphological, cultural, and inoculation (including protection) tests demonstrated beyond doubt that the organism was *B. pestis*.

Disinfection and disinfectants.—The revision of Public Health Bulletin 42 (Disinfectants: Their Use and Application in the Prevention of Communicable Diseases) has been completed and is now in press.

Wassermann reactions.—As in previous years, a considerable number has been submitted to the usual serological test for syphilis. Service stations furnish the great majority of these.

Specimens have been furnished from two institutions in sufficiently large numbers to make the figures of interest. From the United States Marine Hospital in Boston specimens were received from 560 patients, of which 87, or 15.5 per cent, were positive, while of 209 specimens from the National Training School for Boys 8 were positive, 3.7 per cent. The large difference is doubtless due to the fact that the Marine Hospital patients were adults, while those at the training school were minors, the majority not having reached the age at which syphilis is likely to be acquired.

Examination of specimens.—A large number of specimens were received for examination. Aside from those coming in for research purposes only, the following table gives the list of the specimens examined:

Blood:			
Wassermann test—			
Positive	278		
Negative	1,334		
Anticomplementary	40		
Specimens not satisfactory	55		
		1,707	
Malaria, all being negative		170	
Widal test—			
Positive	3		
Negative	10		
		13	
Carbon monoxide		2	
Count		24	
			1,916
Tissues			41
Feces			289
Urine			61

Sputum:		
Positive for tuberculosis	11	
Negative for tuberculosis	16	
		27
Spinal fluid for Wassermann test (negative, 12; specimens defective, 2)		14
Diphtheria cultures and swabs:		
Positive	44	
Negative	117	
		161

Animal heads examined for rabies:	Positive.	Negative.	Decomposed.	Total.
Dog	84	49	12	145
Cat	4	8	2	14
Cow	8	5	0	13
Hog	1	2	0	3
Horse	0	1	0	1
Rabbit	0	1	0	1
Opossum	0	1	0	1
	97	67	14	178

Grand total	178
Disinfectants	39
Water	542
Miscellaneous	158
Total	3,426

Antityphoid vaccine.—The ordinary typhoid vaccine has been prepared and distributed in larger quantities than in preceding years and it is expected that the demand will continue heavy. The making and testing of this product and of antirabic virus require the greatest care to avoid errors in technique that might be serious or even disastrous.

Late in the fiscal year it became advisable to prepare paratyphoid vaccine. This prophylactic, comprising the organisms of paratyphoid "A" and "B," is now ready for distribution.

Over 300 persons were given the typhoid prophylactic at the laboratory during the fiscal year, and 98,989 cubic centimeters of the vaccine, sufficient for 33,000 persons, were distributed.

Pasteur treatment.—The Pasteur treatment was given at the laboratory as heretofore, 39 patients receiving the injections during the fiscal year, and material for 1,680 treatments being sent to State and other beneficiaries, as noted in the following tabulation:

Sent to—	Treatments.
Alabama	230
Arkansas	95
Colorado	41
Delaware	8
Florida	1
Idaho	46
Illinois	56
Indiana	17
Iowa	52
Kansas	26
Kentucky	100
Maryland	42
Massachusetts	14
Mississippi	158
Missouri	4
Nevada	119
New York	2
North Carolina	299
North Dakota	1
Oregon	32
Canal Zone	12
Porto Rico	7
South Carolina	1
Tennessee	66
Utah	33
Virginia	93
War Department, not including the Canal Zone	26
Washington	90
Wisconsin	9
Total	1,680

DIVISION OF PHARMACOLOGY.

Prof. Carl Voegtlin, who has been in charge of the laboratory studies of pellagra at Spartanburg, S. C., during the previous fiscal year, resumed his duties as Chief of the Division of Pharmacology in October, 1916.

Physiological significance of vitamines in nutrition.—Work has been continued on this problem, and many new facts have been discovered concerning the importance to health of the presence of small quantities of so-called vitamines in the diet of man and the higher animals. The studies have resulted in many improvements in the method of preparation of vitamine fractions possessing a high physiological activity, but the antineuritic vitamine has not yet been obtained in chemically pure form.

Work with fairly pure preparations of antineuritic vitamine has demonstrated that this substance has a very marked stimulating effect on the growth of animals (pigeons, mice, hogs, and dogs), and presumably also on man. This substance must be present in the diet in sufficient quantity in order that normal growth can be obtained.

Experiments have also been carried out aiming at the production of polyneuritis in the higher animals due to a vitamine deficiency of the diet. It was found that cats develop this disease with great regularity on an exclusive diet of meat which has been subjected for three hours in the presence of sodium carbonate to a temperature of 120° C. Typical symptoms appear within three to seven weeks.

During the year it has been determined that exposure of meat to a temperature of 120° C. for three hours does not destroy the antineuritic vitamine contained in this food. This observation would seem to indicate that the canning of meat is a procedure which does not necessarily destroy the antineuritic vitamine. Similar experiments with milk and other foods are being conducted.

Another phase of the investigation has dealt with the influence of various degrees of milling on the nutritive value of wheat flour and bread prepared from such flour.

Medicinal value of domestic digitalis.—Various samples of digitalis growing wild in Oregon were tested as to their content in active principles. It was found that these specimens yielded tinctures which complied with the standards set forth in the United States Pharmacopœia, ninth edition. A short article on the subject was published in the Public Health Reports, inviting attention to this source of digitalis, which may become of great value should the importation of digitalis from England decrease on account of war conditions.

Toxicity of commercial preparations of emetine.—In view of statements in the medical journals claiming that an abnormal high toxicity of some of the commercial preparations of emetine was responsible for the toxic symptoms or deaths occurring in patients treated with it, 10 such preparations were subjected to toxicity tests on a large number of animals. The results obtained clearly prove that the various preparations do not differ appreciably in toxicity. On the other hand, it was found that the toxic symptoms sometimes observed in patients following the administration of average therapeutic doses of emetine may very well be explained by an abnormally low resistance of the individual to the drug.

Cocaine and cocaine substitutes.—In connection with the enforcement of the Harrison antinarcotic law a comparison was made of the pharmacological action of cocaine and novocain. No essential differences were found to exist between these drugs. However, it was impossible by the means at the disposal of the investigator to determine any habit-forming property of novocain. The results of this study indicate that physicians should be careful to avoid injecting these substances so that they enter directly into the blood stream, as failure of the respiration and heart may follow such procedure.

Standardization of Cannabis indica.—Considerable work on this subject had demonstrated that the method for the physiological standardization of cannabis as adopted by the ninth edition of the United States Pharmacopœia did not always yield satisfactory results. Attempts to improve this method have not been successful.

Action of drugs on ureter.—The nervous innervation of the ureter and the action of drugs on this organ were studied. A number of observations of scientific interest were made, and a paper reporting these results was prepared for publication.

Action of distilled water on isolated uterus preparation.—In the course of some investigations of the action of drugs on the uterus it was observed that this organ is greatly stimulated by small amounts of distilled water added to the suspension fluid. This observation calls attention to certain precautions to be observed in the physiological standardization of drugs acting on the uterus.

Isolation of two hitherto unknown milk constituents.—A paper reporting the discovery of the presence of adenine and guanine in milk was prepared for publication.

Digest of comments on U. S. Pharmacopœia and National Formulary.—Preparation of the material for the Digest of Comments for the year ending December 31, 1915, is nearly completed.

Pharmacopœia of the United States.—In compliance with a precedent established in connection with the eighth revision of the United States Pharmacopœia, there has been published an epitome of the changes in the Pharmacopœia and the National Formulary as Hygienic Laboratory Bulletin No. 107. A review of the last edition of the United States Pharmacopœia was published in the Public Health Reports for October 27, 1916.

Toxicity of salvarsan and analogous compounds.—A study of the toxicity of the commercial preparations of salvarsan has been commenced. The work has demonstrated the necessity of working out a reliable method for testing the toxicity of these preparations. In view of reports of undesirable toxic reactions resulting from the administration of these preparations in the treatment of syphilitics, it is important to discover a means to standardize them.

Pine-oil disinfectant.—The toxicity of pine-oil disinfectant was studied on animals, the results showing that the disinfectant possesses an exceedingly low toxicity. On the basis of the toxicity in rats a minimal lethal dose of the unfinished disinfectant for an adult man would be about 15 liters.

Trikresol as a preservative for antipneumococcic serum.—An investigation has been commenced to determine the possible injurious action of trikresol as a preservative of antipneumococcic serum.

Miscellaneous examinations and analyses and other routine work.—Samples of drugs were examined as to their purity for the purveying

depot of the service. Numerous blood samples from miners, submitted for examination by the United States Bureau of Mines, were tested for the presence of carbon monoxide. Proprietary drugs were examined for the Bureau of Internal Revenue. Assistance of a varying nature was given to other departments of the Government and to the National Board of Medical Examiners.

DIVISION OF ZOOLOGY.

Prof. C. W. Stiles has remained in charge of the Division of Zoology.

International Commission on Zoological Nomenclature.—Owing to present war disturbances, the work of the International Commission, of which the chief of division is secretary, has encountered serious difficulties; but the work is being continued as rapidly as circumstances permit, and several important opinions have been prepared and sent out for vote. An extensive study has been undertaken to determine the status of a large number of generic names in more or less common use, with a view to placing as many of them as possible in the Official List.

Index Catalogue of Medical and Veterinary Zoology.—The third volume of the subject catalogue is being edited for press. This volume includes the roundworms (Nematoda, Gordiacea, and Acanthocephali). The manuscript for the host catalogue is being typewritten.

Determination of zoological specimens.—As in the past, the nature of zoological specimens submitted to the division has been determined.

Fauna of sludge.—Studies in regard to the fauna of sludge have been continued.

Endamœba gingivalis and pyorrhea.—In cooperation with the dental department of St. Elizabeth's Hospital (the Government Hospital for the Insane), a study has been made of the reported relation between the parasitic protozoon, *Endamœba gingivalis*, and pyorrhea. A report of the study has been prepared for publication.

One case of pyorrhea was examined at 7 different times during a year and at no time was the *Endamœba gingivalis* found. Most cases, however, showed the parasite. Upon using the treatment with emetine, so highly recommended by some authors, it was found that of 27 cases that were followed, 3 were greatly improved, 9 slightly improved, 13 remained stationary, and 2 became worse.

Of a group of 26 cases followed microscopically, 12 patients showed the amœbæ within 4 days after treatment ended, 6 additional persons within 10 days, 4 additional within 31 days, 2 more within 59 days, only 2 cases failed to show the germs at the end of 2 and again at the end of 9 months, and 1 of these cases showed no amœba prior to treatment. Thus, the results failed to confirm reports of other workers as to the relation between this protozoon and pyorrhea.

Disinfection of human excreta.—Most work on the disinfection of human excreta has been undertaken from the standpoint of diseases (typhoid, etc.) caused by bacteria. It is, however, obvious that the conclusions reached can not be applied to disinfection against the germs (eggs and spores) of animal parasites, such as *Endamœba histolytica* (of amebic dysentery), *Lamblia*, *Ascaris*, hookworms, flukes, and tapeworms, for which thoroughly satisfactory methods of disinfection, especially from the standpoint of expense and labor, have not been available.

Experiments have therefore been conducted to determine the effect on hookworm eggs of (1) fermentation, (2) pyxol, (3) pine oil, (4) sulphuric acid, (5) calcium chloride, (6) copper sulphate, and (7) sodium hydroxide.

From this study it was determined that sodium hydroxide and probably copper sulphate will kill hookworm eggs in feces within reasonable time, at a moderate expense, and with a minimum of labor. It should be observed that *Ascaris* eggs are more resistant than hookworm eggs, and *Endamœba coli* and *Lamblia* spores less resistant.

When the disinfected excreta were poured out on the ground, the odor was slight, less than that connected with stable manure. Thus it seems probable that a method may be developed whereby human excreta can be disinfected against the germs of animal parasites as well as against those of typhoid fever and similar diseases, at a low expense and with little labor, and that the excreta may then be used promiscuously as fertilizer.

DIVISION OF CHEMISTRY.

Prof. E. B. Phelps has continued in charge of the Division of Chemistry.

Ventilation studies.—Studies of the fundamental physical factors involved in the process of heat interchange, conducted for the past five years in connection with an investigation by the New York State Commission on Ventilation, were completed during the year. The special line of investigation was the study of various types of comfortimeters intended to record the actual characteristics of the atmosphere in terms of physical comfort. In this connection, studies of the rate of heat loss, as affected by the velocity of air movement and humidity, have been made.

Theory of disinfection.—Studies of the bactericidal action of certain substances, particularly phenol, have been made with a view to determining the fundamental nature of the process of disinfection. This information is desired in connection with both the use of disinfectants and the standardization of methods of disinfectant testing.

Oxygen diffusion.—An investigation into the physical constants of oxygen diffusion has been carried on during the past three years in an endeavor to obtain further information upon this natural phenomenon so important in any theory of the self-purification of streams.

Studies on disinfectants.—Studies upon the disinfecting possibilities of various available commercial products have been continued. New substances have been studied, and additional studies have been made with the previously developed pine-oil disinfectant. The most important result of this work has been to emphasize the unreliability of the accepted phenol coefficient as a general measure of the value of this disinfectant. A more satisfactory method of expressing its strength is hoped for.

Detection of small quantities of poisonous gases in the atmosphere.—At the request of the American Public Health Association's committee on air analysis, methods for the determination of methyl alcohol, benzol, and its nitro and chlor derivatives, aniline and its derivatives, and certain of the higher alcohols are being developed.

Other investigations.—Special studies and reports have been made from time to time upon matters submitted to the division:

(1) A method for the detection of small quantities of hydrocyanic-acid gas in the hold of a ship which has been fumigated has been developed.

(2) A special investigation has been made of the possibilities of a municipal pasteurizing plant for Tuscaloosa, Ala.

(3) Determinations of copper and zinc in oysters have been made.

(4) A study of methods for the detection and measurement of small amounts of phenol, cresol, and other preservatives in serum has been made.

(5) A study of the chemical characteristics of certain specimens of glass bottles and flasks with reference to soluble alkali has been conducted.

Routine work of division.—The routine work of the division has comprised the chemical examinations of approximately 250 specimens of sewage for the field investigations; the examination of 12 specimens of drugs for compliance with the United States Pharmacopœia requirements; 16 special examinations of various materials submitted by the bureau and others; the examination of 116 samples of Potomac River water for the superintendent of sewers, District of Columbia; the determination of hydrogen-ion concentration in specimens of media and serums; and the preparation of standard solutions and reagents for other disinfectants.

Viruses, Serums, Toxins, and Analogous Products.

Enforcement of law.—In the enforcement of the law of July 1, 1902, regulating the sale of viruses, serums, etc., 46 inspections of establishments were made, the licenses of 21 establishments were renewed, and 2 new establishments were granted licenses for the first time. In 5 cases licenses were refused. In view of the fact that some establishments located in Germany had not been inspected within the time required by regulation and on account of present conditions would not be accessible to inspection for an indefinite period of time, the licenses of these establishments were revoked. Four other licenses were revoked, 2 were discontinued at the request of the concern licensed, and 2 were suspended. At the termination of the fiscal year 31 establishments (23 American and 8 foreign) were holding licenses. The complete list has been published in the Public Health reports of June 8, 1917, and also issued as Reprint No. 401.

A total of 5,506 samples of products were examined at the Hygienic Laboratory during the past fiscal year, as against 5,187 in 1916, 3,102 in 1915, and 1,113 in 1914.

Investigation of biologic products.—Following the adoption of the sundry-civil act approved July 1, 1916, which provided a special fund for this work, the investigation of biologic products was given a much broader scope than had hitherto been possible. Four new positions were established in this section of the Division of Pathology and Bacteriology, Hygienic Laboratory, and equipment for the expansion was promptly installed.

The work on the standardization of typhoid vaccine has been continued with satisfactory results.

Studies in connection with the application of a manufacturer for a license for a vaccine against exanthematic typhus showed that cultures of the Gram positive diphtheroid which is believed by several workers to be the cause of typhus fever would not protect against the virus of Mexican typhus.

The standardization of antimeningococcus and antipneumococcus serum was taken up.

Conference with State and Territorial Health Authorities.

Owing to the entrance of the United States into the war, the date of the fifteenth annual conference of State and Territorial health authorities with the service was advanced from June 1 and 2 to April 30 and May 1. This was done in order that a clearer idea could be had of the effect on national health of the changed sanitary conditions arising out of the war and that a consensus of opinion could be arrived at as to the broad lines to be followed in meeting these changed situations and the relation of the State health authorities to them. Recommendations embodying the decisions of the conference in regard to these important matters were adopted and formed the basis for the cooperation which has been developed between the State health authorities and the service in the sanitation of cantonment surroundings and in other public-health work related to the conduct of the war.

In addition to the above, the conference discussed the following subjects, passing resolutions in regard to some of them: Present status of employment of full-time health officers; local health organization, especially in rural sections; the typhus-fever situation; morbidity statistics; and other important matters. Reports of committees were heard in regard to: Morbidity returns, sanitation of public conveyances, interstate and intrastate quarantine regulations, health insurance, standard methods of public health accounting, increasing efficiency of conferences, and rural sanitation.

The report of this conference, including the resolutions passed, will be published.

Representation at Meetings of Scientific and Sanitary Associations and Congresses.

As in the past, the service was represented by one or more officers at a large number of annual and other meetings of scientific or sanitary associations and congresses. In most cases the representatives read papers relating to public health, and in all acquired information of scientific or sanitary importance to the work of the service.

Dissemination of Information.

In order that the results of investigations shall accomplish their purpose it is necessary to disseminate them through proper channels. Among the means taken to this end are: (1) Personal interviews with health authorities following particular studies within their jurisdictions, (2) publications, (3) other reports, (4) lectures, (5) press service, (6) exhibits, and (7) correspondence.

Interviews and conferences.—Inasmuch as many investigations are undertaken on the request of State and local authorities to meet an emergency, the results of investigations are frequently made known verbally as soon as obtained and advice given based on these data, so that remedial action may be immediately taken. Advantage is frequently taken also of situations to advise not only the health authorities but the mayors and councils of cities and, at times, the executives and legislative bodies of States.

Publications.—Monographs on sanitary subjects are regularly issued in the weekly Public Health Reports, in reprints of these reports, and in special publications, such as Public Health bulletins and Hygienic Laboratory bulletins. In these publications a large number of the investigations considered above are reported, as will be seen by reference to the report on publications, page 324.

Other reports.—In some cases reports of investigations are submitted to the authorities in typewritten form.

Lectures.—In addition to papers read at meetings of scientific or sanitary associations, opportunity is taken of the presence of officers in the field to give popular addresses. By this means not only is information of local interest conveyed, but the activities of the Public Health Service are brought directly to the attention of the public generally. In some cases courses of lectures on public health have also been given by officers of the service.

Press service.—Brief abstracts of all publications issued have been furnished regularly to the Division of Domestic Quarantine for dissemination to the newspapers of the country.

Exhibits.—Some of the results of scientific investigations have also been made public by the Division of Domestic Quarantine by means of exhibits and stereopticon slides.

Correspondence.—A large number of replies are made to letters requesting information of a hygienic or public health nature.

MARITIME QUARANTINE.

During the fiscal year ended June 30, 1917, service operations included, as in former years, the enforcement of the United States quarantine laws and regulations providing measures to be undertaken for the prevention of the introduction of the various quarantinable diseases. In addition to these duties, officers in charge of quarantine stations were charged with the supervision of the repair and preservation of stationary construction and floating equipment.

At the various national quarantine stations on the mainland of the United States there were inspected 12,431 vessels and 709,770 passengers and crew. At foreign and insular ports service officers inspected 5,834 vessels and supervised the fumigation of 1,897 vessels. For the destruction of rats and mosquitoes on vessels at the mainland stations 1,150 ships were fumigated with cyanide gas and 1,646 vessels with sulphur dioxide. The grand total of passengers and crew inspected was 1,348,847 and of vessels fumigated, 4,693.

During the fiscal year ended June 30, 1916, service officers inspected at all stations 17,318 vessels and fumigated 3,530 vessels, this being an increase in tranactions over the previous year of 947 vessels inspected and 1,163 vessels fumigated.

Expansion of Quarantine Administration.

During the year a service officer was detailed as quarantine officer for the Virgin Islands, with station at St. Thomas.

The island of Cauit, in the harbor of Cebu, was set aside by Executive order as a national quarantine reservation under the control of the Secretary of the Treasury and the quarantine ground and anchorage formally prescribed by the Surgeon General with the approval of the Secretary of the Treasury. Cauit Island has been the quarantine reservation at Cebu station since 1904, but before the issuance of the Executive order the title was under the insular government. Thus, the only two quarantine reservations in the Philippine Islands, Cauit and Mariveles, are now national quarantine reservations under the direction of the Secretary of the Treasury.

The Executive order was as follows:

Executive Order.

Designation of anchorage grounds at the quarantine station on Cauit Island, Cebu, Philippine Islands.

Whereas, by Executive order dated October 25, 1904, Luke E. Wright, civil governor of the Philippine Islands, set aside and reserved the island of Cauit, Province of Cebu, Philippine Islands, "for the use of the Quarantine Service

and the Marine Hospital Service," and said island is now used as a United States quarantine station; and

Whereas, the act of Congress approved August 29, 1916, provides that all the property and rights which may have been acquired in the Philippine Islands by the United States under the treaty of peace with Spain, except such land or other property as has been or shall be designated by the President of the United States for military and other reservations of the Government of the United States * * * are hereby placed under the control of the Government of said islands to be administered or disposed of for the benefit of the inhabitants thereof.

I hereby designate, confirm, and set aside the island of Cauit, Province of Cebu, Philippine Islands, for use as a quarantine station under the Treasury Department of the United States.

WOODROW WILSON.

THE WHITE HOUSE,
28 June, 1917.

(No. 2649.)

Reedy Island quarantine station was reopened in May, 1917, as an inspection as well as detention station on account of war conditions necessitating the inspection of vessels by quarantine, naval, immigration, and customs officers at a point lower down the Delaware River than Marcus Hook. For the past three years quarantine inspection of vessels entering Philadelphia has been performed at Marcus Hook by service officers and Pennsylvania State officers conjointly, the Reedy Island station being maintained for detention purposes only.

The New York quarantine station is administered by a service officer appointed by the governor of New York for that purpose, but the station is under State control and the transfer to national control is still pending. The New York Legislature has signified its willingness to transfer the station to the Government in a joint resolution dated February 15, 1917. An appropriation for the purchase of the New York quarantine station, inserted in the sundry civil act of 1918, was favorably acted upon by the Senate, but was stricken out when that measure was considered in conference.

During the year rather comprehensive and adequately equipped quarantine stations, with disinfecting apparatus, were constructed at El Paso, Eagle Pass, Laredo, Brownsville, Rio Grande City, and Hidalgo. Formerly disinfecting plants on the Mexican side of the border were utilized where available and extemporized expedients were resorted to at other points. Altogether, such arrangements were unsatisfactory and left much to be desired in the way of effectiveness. The maintenance of service owned and controlled plants on American territory promised to meet the necessary requirements.

The National Government now owns and operates 61 quarantine stations on the mainland of the United States. In the Philippine Islands, Hawaiian Islands, Porto Rico, and the Virgin Islands 26 stations are administered by officers of the United States Public Health Service. Of the total, 41 have detention facilities or floating equipment and 46 have facilities for the conduct of inspections only.

GENERAL PREVALENCE OF QUARANTINABLE DISEASE.

Plague, yellow fever, cholera, typhus, and smallpox have prevailed in countries having intimate commercial and traffic relations with the United States, and each of these infections has constituted a potential menace to the sanitary condition of this country.

Cholera.—A very extensive epidemic of cholera ravaged Japan in the fall of 1916, and assumed such proportions that bacteriological examination for cholera carriers was enforced at the Pacific coast and the insular quarantine stations against passengers from the Orient. At Port Townsend, San Francisco, Honolulu, and Manila 13,327 bacteriological examinations were performed. At Manila 21 carriers were discovered among those examined and were denied passage.

A disease in epidemic proportions clinically simulating cholera was reported as prevalent in eastern Mexico and on the Isthmus of Tehuantepec. Investigation by service officers made it apparent, however, that the suspected cases were the algid form of malarial infection.

Although cholera was reported as present in several of the belligerent countries of continental Europe, it did not actively menace trans-Atlantic commerce, chiefly because of the restricted maritime traffic with the infected countries.

Plague.—Plague was reported as present in every section of the globe. The infection continues to prevail in epidemic form on the west coast of South America, particularly in the city of Guayaquil. In Brazil plague was reported in several widely separated States of that Republic. Reports were likewise received of its prevalence in South Africa, Egypt, and various ports on the Mediterranean, India, the entire China coast, Japan, and the Malay Archipelago.

Rodent plague from time to time was reported at Liverpool, London, Hull, and Bristol. Apparently at these English ports the infection never effected a secure hold, and probably the infection reported was introduced from vessels from the Orient. On several occasions plague, both in man and in rodents, was reported in ships en route from India to European ports.

Plague infection was reported during the year from the island of Hawaii, and probably was an exacerbation from a residual focus.

Rodent plague was discovered as the result of the fumigation of a vessel at New Orleans quarantine. The source of the infection remains a matter of speculation, since within the preceding 12 months the vessel had not been to any known plague-infected port, but had plied between ports of the United States, more particularly New York and the continental ports of Europe and England.

To prevent the introduction of the infection into the United States all vessels from plague-infected ports were fumigated for the destruction of rodents. At Hongkong rodent infection was demonstrated on a vessel about to sail for an American port. The vessel was fumigated under the supervision of the service officer on duty in the American consulate at Hongkong. As a result two infected rats were found among those destroyed. The referred-to vessel, however, had not had any infection amongst the personnel. Rodent plague prevails so extensively and so insidiously that with the world-wide journeying of cargo carriers it is almost impossible to decide what ships have been exposed to the infection. The only solution of this problem appears to be a periodic fumigation of all vessels from foreign ports for the purpose of making them as nearly rat free as possible.

Yellow fever.—Yellow-fever infection was reported during the year from Mexico, Guayaquil, and the west coast of South America,

from Brazil, and from Barbados and Martinique, in the West Indies. The disease reported as yellow fever in Barbados was subsequently determined by Asst. Surg. Gen. H. R. Carter and Dr. Juan Guiteras, after an investigation, to be some other infection. The endemicity of yellow fever in Maracaibo, Venezuela, still continues to be a moot question, mild cases being reported from time to time by the local profession. Acting Asst. Surg. Stewart reports from La Guaira that while the form of fever in Maracaibo is more or less atypical and mild, the general trend of medical opinion, nevertheless, both at Maracaibo and Caracas, is that occasional cases of yellow fever do occur at Maracaibo and in the vicinity.

Two cases of yellow fever were discovered in the fall of 1916 on a ship from Progreso. The vessel was detained by the quarantine officer at New Orleans quarantine station. The ship was appropriately treated and, no other cases developing, was released after six days' detention.

Yellow fever was reported in epidemic proportions from the Provinces of Yucatan and Campeche during the summer of 1916 and in June, 1917, the infection was again reported in Yucatan, the first case being in the person of a nonimmune from Mexico City. This circumstance merely emphasizes the endemicity of yellow-fever infection in the Province of Yucatan.

A severe epidemic of unknown infection but suspiciously like yellow fever was reported as prevalent in Tampico, Vera Cruz, and the Isthmus of Tehuantepec during September and October, 1916. In Tampico, with an estimated population of 45,000 persons, there were in the month of September some 616 deaths, or an annual death rate for that period exceeding 160 per 1,000. The State of Nuevo Leon, Mexico, instituted quarantine measures against persons coming from Tampico on the assumption that the epidemic in Tampico was yellow fever. Investigation by service officers, Surgs. Guiteras and Francis and Passed Asst. Surg. Ridlon, and also a representative of the Cuban sanitation department, demonstrated that the chief cause of the high mortality rate was malarial fever, both the pernicious and benign form. There were many cases of the algide and hemorrhagic malarial type of infection, which, accompanied by dysenteric infection and the lowered vitality of the poorer class, inability to secure proper medication and even sufficient nourishment, caused a very high death rate. Passed Asst. Surg. Ridlon reported that in a personnel of 180 men on the U. S. S. *Nashville*, lying in the Panuco River off Tampico, 122 had been down with malaria, the cases, however, being reported by the ship's surgeon as the benign type of the infection. The anopheles albimanus seems to have been the chief malarial carrier in the vicinity of Tampico. Yellow fever was excluded as a factor in the morbidity of Tampico and Vera Cruz, but considering the endemicity of the infection in Yucatan and Campeche there is grave apprehension that the disease may at any time be imported to Vera Cruz and Tampico, at both of which places conditions are most favorable for an epidemic once the infection is introduced.

Acting Asst. Surg. Gimler stationed at Progreso reported the occurrence of 31 cases in Progreso and Merida during the summer of 1916. It is thought, however, that the disease was probably more

extensively present in those Provinces than the cases actually reported would indicate.

Smallpox.—Smallpox continued to be prevalent at most of the world ports having commercial relations with the United States, but the chief source of concern in this connection was the prevention of the introduction of the infection from Mexico, in which country the disease prevails very extensively, and is of a specially malignant type of infection. Vaccination was performed at the various border quarantine stations against all persons coming from Mexico who did not present evidence of immunity, either through a recent attack or recent successful vaccination. This practice of vaccinating incoming travelers was also extended where necessary to the purely local traffic. At the various national quarantine stations on the Texas-Mexican border there were vaccinated 110,073 persons.

Typhus fever.—While typhus continued to be reported from the various European countries in particular, its prevalence in Mexico constituted the chief menace of the introduction of the disease into the United States. It is especially to be noted that in carrying out preventive measures along the border Inspector David M. White, contracted the infection and died. Dr. W. C. Kluttz, city health officer at El Paso, likewise contracted the infection in the line of duty with a fatal issue. The chief measures taken to prevent the introduction of typhus infection on the border are described under the heading "Quarantine Operations Along the Mexican Border."

Quarantine Operations Along the Mexican Border.

Typhus fever continued to be as serious a menace along the Mexican border during the fiscal year 1917 as it was in the preceding year. No official reports were received from Mexican officials, either local or federal, as to the prevalence of this disease, but from authoritative sources and statements in various Mexican papers, it was evident that typhus prevailed in Mexico on an unprecedented scale, thousands dying of the disease. These reports indicated that the morbidity and mortality of typhus in Mexico during the fiscal year 1917 were greater than in the preceding year. In the city of Zacatecas, capital of that Province, the local aid society reported 2,000 deaths from typhus in the four months preceding September, 1917, the population of that city being approximately 60,000.

Increased facilities for the application of effective preventive measures were secured, however, at the various ports of entry along the Texas-Mexican border in the way of adequately equipped buildings for disinfection purposes under the control of the service. The policy of the service, as in the previous year, contemplated only the treatment of incoming travelers for the purpose of rendering them and their personal effects vermin free. No attempt was made to establish a 12 days' detention for the detection of cases in the incubative period on account of practical reasons set forth in the annual report of last year. In brief, the treatment at the border quarantine stations accorded to travelers from Mexico who were considered as likely to be vermin infested was as follows:

The men and women were separated, males entering one side of the building, women and small children on the other. In suitable rooms

all clothing was removed, made into a bundle, and put through an opening in the wall into the central portion of the building, where steam disinfection was accomplished. Shoes, hats, belts, and other articles which might be injured by steam were placed in a large laundry basket, and when necessary were exposed to hydrocyanic-acid gas in a specially designed chamber. A small waterproof bag was given to all persons, so that they could place therein their money or valuables and retain them in their possession. After the clothing had been removed and passed into the disinfecting room the nude person was next inspected by a male or female attendant, as the case required, for vermin infestation. If head lice were found the hair of the men and boys was clipped, the hair dropped on newspaper, and this burned. The heads of women infested with head lice were treated with a mixture of equal parts of kerosene and vinegar, applied to the hair for one-half hour. The dilute acetic acid loosens the eggs from the hair, and the kerosene kills or stupefies the adult lice, which are thereafter removed by washing the head and hair with warm water and soap. After this treatment liquid soap is sprayed upon the body from an elevated reservoir, and the person passed on to the shower baths. The soap container is a 5-gallon can with a spout in the bottom to which a rubber tube is attached, the method of handling being similar to that of a fountain syringe with clip attached. The soap is made by boiling 1 part of soap chips in 4 parts of water and then adding 2 parts of kerosene oil. When used, 1 part of this product is added to 4 parts of warm water, this making a good liquid soap at a small cost.

The bathing process is supervised by attendants, and the persons treated thereafter pass into a rear room in which clothing is received through an opening in the wall, after having been disinfected by steam. In the disinfection room bundles of clothing are placed in a steam chamber. When the chamber is full a vacuum of 10 to 15 inches is made, and thereafter steam is introduced until the pressure gauge shows 20 pounds, the temperature being 259° F. The exposure is maintained for 10 minutes, after which a second vacuum is created for the purpose of drying the clothes. The entire procedure requires from 25 to 35 minutes, and although lice are killed by a very short exposure to 212° F., the higher temperature is easily attained and held to insure efficiency. The operator generally controls the maintenance of temperature by wrapping a thermometer in bundles of clothing placed in different parts of the loaded chamber at the top, bottom, and middle and thus secures a fairly satisfactory determination of the efficiency of the sterilization. The water for the shower baths in the plants along the border is heated as the weather may require, some of the stations using coal-burning and others oil-burning heaters. The various plants have attached a cyanide-gas room for disinfection of personal effects and baggage when necessary.

Sole reliance has been placed on rendering incoming travelers free of lice and excluding those obviously ill. Encouragement and assistance are extended to State and local authorities toward improving the sanitation of those communities in the Southwest where exist Mexican colonies or camps of Mexican laborers. Generally speaking, the living conditions in those quarters differ but little, if at all, from those which obtain in the same class living in Mexico—overcrowded,

indifferent to personal hygiene, and badly vermin infested. A very notable improvement was achieved, especially in El Paso and in the mining and railroad construction camps scattered throughout the Southwest. This latter was accomplished chiefly through the cooperation of the medical departments of the several railroads. The effectiveness of the service plants, as exemplified by that at El Paso, was attested by Dr. J. G. Cumming, director of the State Bureau of Communicable Diseases of the State of California, who in his report of an inspection of various communities in the State reported:

> When in view of these control measures instituted at the border of the United States by the Public Health Service the advisability of modifying or abolishing the special regulations (State) was suggested, it became necessary to determine whether or not they had served their purpose, that of minimizing louse infestation * * *. The construction camps were inspected, and the remarkable cleanliness of some very recent arrivals therein contrasted with those imported prior to January, 1917, and evidenced the value of the efficient delousing work done on the border by the United States Public Health Service. In October, 1916, there was louse infestation to the extent of 35 per cent for body lice and 60 per cent for head lice, while the March 1st inspection showed no body lice and only 1 per cent head lice.

These observations refer to Mexican laborers imported for railroad work.

Altogether there were reported from California, Colorado, and American communities located on the Texas border some 122 cases. It is probable that there were isolated cases at these points which were not reported.

Of the 122 cases, it is estimated that 69 were in the incubative period at the time they entered the United States from Mexico; the symptoms developed thereafter at intervals varying from 24 hours to 18 or 20 days. Thirty-three cases contracted infection from foci established on United States territory, 7 contracted infection from contact with infected cases, no focus being established, and in 8 cases the source of the infection was not determined, either through death of the case before data could be secured, or else because cases had been exposed to infection both in Mexico and in the United States.

As to sex incidence, there were 32 females and 85 males, 5 cases not being reported as to sex. Any conclusion as to sex incidence might be misleading, as most of the ceses were in a migrating class, and were for the most part men going to the United States for the purpose of securing construction work on railroads, farms, or mines.

As to race incidence, there were 110 Mexicans, 10 Americans, and 2 Europeans. Here again deductions are difficult because we are not dealing with a fixed population. If two Americans connected with the sanitary force be excluded it can be stated that the typhus cases of El Paso origin were almost all Mexicans. Race mortality shows but little variation, that of American cases being 40 per cent and that of Mexicans being 39 per cent. Sex mortality likewise shows a negligible variation, the death rate among women being 39 per cent and that of men 37 per cent.

As to age incidence, there were 11 cases of 12 years or under and 109 cases over 12 years, the ages of 2 not being given. As to age mortality, in a series of 90 whose age and results were both recorded that of the group of 30 years or younger was 21 per cent, and that of the group of 31 years or over was 60 per cent. Apparently the mortality of typhus increases with the age of the patient.

Senior Surgeon C. C. Pierce, in charge of the general supervision of service quarantine stations along the Mexican border, reports in detail as follows:

The service work along the border to prevent the introduction of typhus from those districts where it is prevalent in Mexico has been vigorously carried on during the fiscal year with increased personnel and equipment at various points along the border. The measures effected on the border were as satisfactory as could be expected, in view of the difficulty of maintaining quarantine restrictions on a boundary line 1,300 miles in length from El Paso to the Gulf, presenting no material natural obstacles to travel. From El Paso to the Pacific Ocean the boundary between Mexico and the United States is 719 miles in length, but the western Mexican States of Sonora and Lower California have fortunately been comparatively free from typhus fever. This presumably is due to the difficulty of travel between this section of Mexico and the typhus-infected plateau region of that country. Cases of typhus have not been reported as entering the United States at any border point west of El Paso, Tex.

During the latter part of the last fiscal year it was found from experience that the utilization of disinfecting plants located on Mexican territory and operated by Mexican officials was not satisfactory, although an employee of the service was stationed at each plant in a supervisory capacity. No standard could be enforced in regard to the hours of operation nor the control of persons and their effects after disinfection. The operation of these rehabilitated Mexican plants was commenced during the winter of 1915–16 to meet an urgent necessity at a minimum expenditure, and was only intended as an expedient.

The bureau, therefore, in the summer of 1916 began to devise plans for the erection of fully equipped disinfecting plants on American territory, at the various border points where they were required and to arrange for their construction before the onset of cold weather, at which time it was anticipated that there would be a considerable increase in the number of cases of typhus. The officer in charge of the work along the Mexican border in September, 1916, was directed to arrange as rapidly as possible for the location and construction of plants at the various border ports. The plans of the plants required were drafted and approved, and orders were placed for the necessary equipment, including steam sterilizing chambers.

In establishing these plants many unforeseen contingencies were encountered, thus delaying the operation of the disinfecting stations. One source of delay was the impracticability at some of the border towns of securing title to suitably located sites upon which the plants could be erected. This made it necessary at some of the border ports of entry to make arrangements with local property owners for the erection of special buildings to be rented for quarantine purposes to the Government. This procedure was followed at El Paso, Brownsville, and Hidalgo, Tex. At Eagle Pass and Rio Grande City, Tex., sites were secured from the War Department on military reservations and the plants were constructed by the service. At the port of Laredo a suitable site was finally leased from the railroad company at a nominal sum and the erection of a quarantine plant upon this location was started, the construction to be completed and in operation by the latter part of July, 1917.

At El Paso the quarantine plant is located at the American end of the international foot bridge, adjacent to the United States immigration station. The street cars run between El Paso, Tex., and Juarez, Mexico, across this bridge, and the international railroad bridge is only a short distance away, so that the plant is easily available for the treatment of all traffic, even when the railroad service is resumed. The El Paso plant was completed during the last days of December, and was opened for service on January 2, 1917. Prior to that time the vermin-infested travelers desiring to enter the United States at that place were treated at the Mexican plant in Juarez under the supervision of an inspector of the service.

David M. White, while on this duty, contracted typhus fever and died October 19, 1916.

Since the El Paso plant has been in operation all persons crossing from Juarez, local travelers as well as immigrants, are deloused as required. From January 2 to January 27 night traffic from Juarez was permitted, but on the latter date quarantine inspection and treatment of travelers was restricted to Juarez from

7 a. m. to 7 p . m., in accordance with the general requirements of the United States quarantine regulations. Some exceptions were made by giving passes to certain officials, physicians, and other well-known persons, whose duties might require them to return from Mexico after 7 p. m. This was necessary to control the travel of vermin-infested persons after night closure of the disinfecting plant. Enforcement of the night closing order caused considerable opposition at first, and resulted in some rioting by the peon class on the international bridge, and the suspension of street car service for a few days. The opposition soon subsided, however, as closing the port at night had the indorsement of all Federal, State, and municipal officials, as well as the approval of the El Paso Chamber of Commerce, and the support of all legitimate business interests of the city.

All persons, including local residents of Juarez and El Paso now entering the United States at El Paso are required to undergo disinfection of personal effects at the quarantine plant, as occasion may arise. The "locals" are required to take the bath and have their clothing disinfected at least once each week. This measure resulted in a very marked improvement of the peon class living in Juarez and in El Paso, since they have readily grasped the fact that louse infestation seriously interfered with their movements and to a certain extent caused restriction of their travel. They are now making an effort to keep themselves clean and vermin free.

As an additional precautionary measure to prevent the spread of typhus fever from border ports of entry to other places within the States, and to prevent in a large measure the travel of those Mexicans who might enter the country clandestinely, an order was issued to all transportation companies operating trains from border towns, directing that no Mexicans of the laboring class or their families be furnished transportation unless they presented a service certificate of disinfection. (Details of these operations are recorded under the transactions of the Domestic Quarantine Division.)

It may be stated that the Mexican colonies in American cities on the border differ in no respect as to their sanitation nor as to habits and living conditions of the inmates from the habitations of the lower class Mexicans on Mexican territory.

Typhus infection having gained access to El Paso in the summer of 1916, the infection appeared to take firm hold with the establishment of several foci of infection in the city of El Paso, the cases, however, being almost entirely confined to the Mexican colony. Acting upon the request of the mayor and city council of El Paso, Asst. Surg. J. W. Tappan was given leave by the service and permitted to accept the position of health officer of the city of El Paso, for the purpose of effecting sanitary reforms in El Paso by the elimination of foci of typhus infection. Later on Asst. Surg. T. C. Galloway was also detailed by the service to assist in the sanitation of El Paso. (Details concerning this work will be found under the heading of domestic quarantine.)

Sixty-seven cases of typhus occurred in El Paso during the fiscal year and are included in tabular form in another part of this report.

At Eagle Pass, Tex., the service disinfection plant was built on the military reservation upon a site adjacent to the international footbridge and the immigration station. A small house for the inspectors was constructed at the end of the footbridge, and from this a fenced-in walk extends to the entrance of the plant. The plant was placed in operation late in January, 1917, and travel regulations were imposed similar to those in force at El Paso. At this port, where only two inbound trains leave daily, the disinfection certificates which Mexicans are required to have before boarding trains, are checked up through the cooperation of the immigration service.

When railroad passenger traffic with Mexico is resumed, those persons requiring disinfection may be removed from the Mexican train before it arrives at the Eagle Pass depot and conveyed through the military reservation to the disinfecting plant for treatment and then released.

Only two cases of typhus fever occurred at Eagle Pass during the fiscal year. The data is given with other typhus cases later in this report.

At Laredo the question of location of the service plant was carefully considered. It was at first contemplated locating the plant at the footbridge, for the reason that until recently all travel from Mexico crossed this bridge, railroad traffic having been suspended for the past two years. A suitable site near the footbridge was selected, but after prolonged negotiation it was found that no

arrangement could be made for the construction of the building required. The local representatives of the railroad company arranged to set aside a suitable site for the disinfecting plant, which is now under construction at the American end of the railroad bridge.

The quarantine building at Laredo will be two stories high, with the disinfecting machinery and bath compartments on the ground floor. The second story is arranged to provide for office and inspection space and facilities for handling first-class passengers, who may not require disinfection.

Partial travel has already been resumed over the railroad bridge at this port and upon the completion of the plant it is contemplated to require all persons entering from Mexico, except the local residents of either border town, to cross at the railroad bridge so that they may pass the quarantine inspection and disinfection treatment when necessary.

The location of the plant at the railroad bridge makes it more accessible for local persons desiring to leave Laredo by train to visit the plant and have their persons, clothing, and effects deloused in order to secure the certificate required by the transportation companies.

During the past year the treatment of infested passengers has been effected by utilizing the Mexican disinfecting plant at New Laredo, Mexico, and to some extent with the cooperation of State officials, disinfecting some persons at a small extemporized plant built at the footbridge by the local State quarantine officer.

Laredo has been closed to night travel during the entire fiscal year, this measure causing no active opposition.

The statistical data regarding the 14 cases of typhus fever that occurred at Laredo during the fiscal year is given later in this report, with the other cases.

During November the officer in charge of supervision of border quarantine visited Brownsville in company with the supervising inspector of the United States Immigration Service along the Mexican border, with the intention of securing the cooperation of the Immigration Service in closing the international ferry between Matamoras, Mexico, and Brownsville, Tex., and requiring all persons entering from Mexico to cross at the international foot and railroad bridge.

This measure was found to be impracticable for the reason that no company or individual could be found who would erect a suitable plant near the railroad bridge, but the construction of a plant convenient to the ferry could be arranged for without further delay. As it was impossible to acquire title to a suitable site, an arrangement was made with the Matamoras and Brownsville Bridge Co., who also own the ferry, to erect a disinfecting plant at the ferry, this building being of the same general type as the plant at El Paso and Eagle Pass. Construction of the building was started about January 1, but due to many unforeseen obstacles, it was not completed and ready for use until May 1, 1917, when it was placed in operation.

Prior to this time, similar regulations to those at El Paso were enforced at Brownsville closing the port to night travel from Mexico. Limited travel by means of official quarantine passes was permitted only at the international bridge, the ferry service being entirely discontinued after 7 p. m. This regulation aroused considerable opposition on the part of local residents of Brownsville and Matamoras, the social relations between these two towns being more intimate than at other points along the Mexican border. The regulation was therefore modified so as to peremit night travel at both the bridge and ferry. Passes permitting this travel were given to quite a large number of persons known to be residents of the two cities and not subject to quarantine disinfection.

No cases of typhus fever occurred in the Brownsville district during the fiscal year. It is believed that the low altitude of this region and the comparatively mild winter climate is conducive to personal cleanliness, thus removing the menace of permanent louse infestation among the peon class. Since the opening of the disinfecting plant, with the routine bathing of "locals" as well as immigrants, a considerable improvement in the personal appearance of those crossing from Mexico has been observed at this port, as well as along the entire border.

The port of Hidalgo, Tex., located about 60 miles above Brownsville, although 8 miles from a railroad on the American side, has for two years been a favorite port of entry for immigrants from adjacent portions of Mexico.

Arrangements were made with a local resident of Hidalgo to build and equip a suitable disinfection station at this port, the work being completed during January, 1917.

Owing to the high price of coal at this station, a steam sterilizing apparatus was not installed at this point, and the hot-air sterilizer used during the previous fiscal year at Hidalgo has been continued in the service with satisfactory results.

The routine vaccination of all arrivals from Mexico, which is carried out at all border ports, has resulted in the almost total absence of smallpox in the vicinity of Hidalgo during this year—a fact that has been frequently commented upon by the local county officials.

No case of typhus fever has occurred at the port of Hidalgo during this fiscal year.

The Mexican Railroad from Monterey to Brownsville follows the course of the Rio Grande for approximately 70 miles west of Brownsville, so that in order to prevent Mexican immigrants from leaving the train and crossing into American territory at a point where no facilities for quarantine inspection and disinfection had been established, it was found necessary to locate such a station at Rio Grande City, Tex.

At this port a suitable site for the location of the service plant was secured from the War Department on the Fort Ringgold Reservation. A frame structure, in which provision is made for the bathing and disinfection of both sexes, was constructed and placed in operation March 1, 1917. The office space of this building is shared with the immigration inspector on duty at this port.

Prior to the erection of the service plant, both immigration and quarantine functions were carried on in tents. No special apparatus for the sterilization of clothing has been installed in the Rio Grande City plant, for the reason that travel at this port is comparatively light, and such persons as are found to be infested with vermin have their clothing treated by submersion in gasoline.

If no facilities were available for the enforcement of the border quarantine regulations at this port, it would probably result in large numbers of Mexican immigrants leaving the train at Mier, Mexico, and crossing at this point in order to avoid the restrictions to which they would be subjected at either Hidalgo or Brownsville, should they continue their journey to either of those ports.

No cases of typhus fever occurred in the vicinity of Rio Grande City during the fiscal year.

COLUMBUS, N. MEX., TEMPORARY PORT.

Upon the withdrawal of the United States Army from Mexico a large number of refugees accompanied the soldiers on their march to the border. In order to handle this unusual situation, Columbus, N. Mex., was made a temporary port of entry, and a service officer was detailed to make the medical inspection of these refugees and to carry out the necessary quarantine measures.

This work covered a period of one week, from February 1 to 7, 1917, during which time 2,749 persons were inspected for disease, vermin infestation, and evidence of immunity against smallpox; 250 of these refugees were found to be vermin infested and were deloused, and 1,010 were vaccinated by the service officer, in addition to 550 who were vaccinated by officers of the Medical Corps, United States Army. No case of quarantinable disease was found, although several persons were temporarily held on account of suspicious illness.

The Army officials had charge of the camp in which the refugees were detained, and furnished all necessary guards and Hospital Corps men to aid the service officer in carrying out this work. Medical officers of the Army loaned a sterilizing outfit and gave their cordial support to enforcing the necessary quarantine restrictions.

Statistical data of quarantine transactions at the Texas-Mexican border points for the fiscal year ending June 30, 1917.

Title.	Brownsville.	El Paso.	Eagle Pass.	Hidalgo.	Laredo.	Rio Grande City.	Total border points.
Number inspected from interior Mexico	6,279	44,289	13,478	5,994	40,359	4,725	115,124
Number local passengers inspected	328,271 [1]	1,560,000	396,747	21,543	775,620	16,752	3,098,933
Total number persons disinfected	[2] 317	106,779	25,836	1,388	19,307	780	154,407
Total number persons passed without treatment	334,233	1,497,510	384,389	26,149	796,388	20,697	3,059,366
Total number persons vaccinated	3,967	64,888	5,509	3,981	30,098	1,720	110,073
Total number sick detained for observation							
Total number sick refused admission	86	610	3	507	282	53	1,541
Total number pieces baggage disinfected	1,895	16,938	33,156	59	15,268	338	67,654
Number of cases of typhus fever from July 1, 1916, to June 30, 1917		67	2		14		83

[1] Approximated. Strict account was not kept of the "locals" crossing the international bridge at El Paso.
[2] Since opening of the disinfecting plant at Brownsville.

DESTRUCTION OF RATS ON VESSELS.

The fumigation of incoming vessels for the purpose of destroying rats has been continued as in former years. The number of rats so destroyed exceeded 18,550, the unknown cases representing those that were not recovered subsequent to fumigation, the omission of search being due to various circumstances. Not infrequently a fumigated vessel leaves port immediately on completion of fumigation, and before the clearance of fumes from the compartments. At other times when vessels are fumigated with cargo aboard subsequent search by the fumigators is only partially successful, as members of the crew are rather prone to throw the recovered carcasses overboard or burn them in furnaces.

For the most part the species of rats destroyed by fumigation were the *Mus rattus* and *Mus alexandrinus*, very few *Mus norvegicus* being reported. It is interesting to note that of 6,072 rodents destroyed at the city of New Orleans through the fumigation of vessels 5,997 were of the two species, *alexandrinus* and *rattus*, and only 10 were Norway rats, the remaining 65 being bandicoots and various species of wood rats.

In addition to the fumigation of vessels for the destruction of rats and mosquitoes, owners and agents not infrequently request this treatment for the sake of destroying bedbugs and other vermin about the vessel.

The agents used at the various stations were cyanide gas and sulphur dioxide, the latter in the strength and duration of exposure as provided in the quarantine regulations; the former in the proportion of 5 ounces of cyanide to 1,000 cubic feet of space and duration of exposure varying from ½ hour for small, above deck compartments, to 1¼ hours for holds. The standard for fumigation by cyanide gas of 5 ounces per 1,000 cubic feet of space, with exposure for 1 hour, as provided in bureau circular of October 30, 1915, is purely a tentative one, and undoubtedly will be altered after more prolonged observation of the practical results obtained.

The exceptionally favorable combination of conditions at New Orleans made possible the testing of the efficiency of fumigation. Vessels, subsequent to fumigation performed either at New Orleans city or at the quarantine station, were thoroughly trapped by the experienced force of trappers operating along the New Orleans water front in connection with plague suppressive measures at that place. Depending on the size of the vessel, from 20 to 140 snap traps were placed on the various ships for periods of 1 to 10 days, according to the ship's stay in port. A record was kept of the number of rats killed by the fumigation and also of those that were subsequently trapped. The excellent records maintained by Passed Asst. Surg. Friench Simpson and his painstaking interest in the investigation made possible a fairly accurate estimate of the efficiency of both sulphur and cyanide fumigations. Such an opportunity of obtaining in a practical way an idea of the results of fumigation for rodent destruction has never before been available, and the data is correspondingly interesting.

There have been ample investigations of fumigations by both sulphur dioxide and cyanide gas under experimental conditions, but such conditions rarely can be said to be identical with the natural environment under which the practice is ordinarily carried out.

Of a total of 182 vessels fumigated by cyanide gas, and irrespective of the part of the ship from which the rodents were obtained, or whether the vessel was empty or loaded, there were recovered 2,811 rats, or an average of 15.44 rats per ship, all killed by the fumigating gas. The trapping on these ships after being fumigated resulted in the capture of 121 rats, an average of 0.66 rat per ship. On this basis of computation, therefore, the efficiency of cyanide gas appears to be 95 per cent, i. e., 95 rats of a possible 100 were destroyed by the fumigation.

Considering a group of 62 vessels treated by sulphur dioxide, the results show 12.05 rats per vessel killed by fumigation, and 3.5 rats subsequently trapped per vessel—an efficiency percentage for sulphur fumigation of only 77 per cent as applied to the entire vessel, irrespective of the holds being loaded or empty. Confining the observations to holds of vessels only, it was noted that the percentage of efficiency of cyanide in empty holds was 99 per cent in a group of 34 vessels recorded, and in a group of 28 vessels the percentage of efficiency for sulphur dioxide was 96 per cent. Thus for empty compartments there was no material variation between the efficiency of sulphur dioxide and cyanide gas as a fumigant, although it will be noted that the exposure to cyanide was 1¼ hours as compared to 6 hours for sulphur dioxide.

The result of fumigation of loaded holds was unsatisfactory for both fumigants, the percentage of efficiency being 80 per cent for cyanide gas and 64 per cent for sulphur dioxide. The observation of the results obtained in the treatment of superstructures, storerooms, crews' quarters, pantries, poop deck, etc., all compartments that as a rule are filled with dunnage, supplies, etc., indicates the marked superiority of cyanide gas as a fumigant over sulphur dioxide. In a series of 32 vessels treated by cyanide gas the percentage of efficiency of this agent as applied to storerooms and other above-deck compartments, was 94 per cent; whereas that of sulphur

dioxide in a series of 32 vessels was only 55 per cent in the treatment of similar compartments. In other words, whereas sulphur fumigation as applied to superstructures destroyed only 55 rats of each 100, cyanide gas killed 94 per 100.

From reports submitted during the past year it appears evident that fumigation by cyanide gas has many decided advantages over sulphur dioxide for the purpose of destroying rats on ships, the only disadvantage of the former being its greater danger to human life. This feature, however, is not an insurmountable objection and can, with ordinary care and attention by responsible persons, be eliminated. On account of an accident and loss of life incident to the fumigation of a vessel at one of the quarantine stations, due to cyanide gas, the following instructions were issued by the Surgeon General:

SAFEGUARDS TO BE OBSERVED IN PERFORMING FUMIGATION WITH HYDROCYANIC ACID GAS.

TREASURY DEPARTMENT,
BUREAU OF THE UNITED STATES PUBLIC HEALTH SERVICE,
Washington, November 4, 1916.

Bureau circular letter No. 100.

To officers of the United States Public Health Service:

1. When a vessel is fumigated with cyanide gas, no one shall be permitted to enter the various compartments of the ship until entry to such space is declared safe by the medical officer in charge of the fumigation.

2. Subsequent to opening hatches, companionways, and ports, not less than 15 minutes shall elapse before anyone shall enter the superstructures, such as staterooms, cabins, saloon, or forecastle, and not less than one hour before entering the holds. This is the minimum, and the time will be prolonged according to the discretion of the officer in charge.

3. If artificial means for ventilation, such as blower or fan, are not available, wind sails shipped into place should be utilized for aeration of holds.

4. Before declaring it safe to enter holds, a captive animal (guinea pig, rat, cat, etc.) shall be lowered and exposed to the aerial content of such compartments, and the effects produced, if any, shall be a guide in estimating the amount of gas present in dangerous quantity.

5. After measures have been taken to free compartments of cyanide fumes, and the application of test by captive animal indicates sufficient dissipation of the gas to make entering the compartments a safe procedure, they should be entered in all parts by one of the fumigators or by the officer himself. This shall be done as a final step before the officer declares the vessel safe to be entered by the personnel connected with the vessel.

6. Decision as to safety of entering compartments shall be made by the officer in charge of the fumigation and on board the vessel concerned; but during the interval between the sealing of compartments undergoing fumigation and the time appointed for determining the safety of entering, the officer may designate a trustworthy employee or employees to attend to the opening up of compartments, the supervising of installation of blower or wind sail, and the prevention of any persons entering compartments before permission of the officer in charge.

7. The provisions of bureau circular No. 79 of 1915 shall be reviewed and the safeguards mentioned therein shall be observed in addition to the foregoing.

8. You will acknowledge receipt hereof.

RUPERT BLUE,
Surgeon General.

Since this circular was issued there have been no accidents attributable to cyanide fumigation, although 900[1] ships have been so treated in the interval up to the end of the year.

[1] Approximately.

The economic saving to shipping when cyanide gas is used is very evident, since the duration of exposure to sulphur dioxide varies from 6 to 12 hours, in contrast to that for cyanide, i. e., 1 hour. While the fumes of sulphur dioxide are not so dangerous to human life as cyanide gas, nevertheless the tendency of sulphur fumes to remain in the holds of vessels for a considerable time not infrequently delays the handling of cargo. Surg. Grubbs reports a case where the holds of a vessel retained 2 per cent sulphur dioxide fumes for a protracted period on account of unfavorable weather conditions—that is, a warm day without wind. Six hours after opening the hatchways the fumes were yet too strong to permit the working of cargo, and it required the use of ventilating fans before the holds were free of gas.

Under natural conditions cyanide fumes generally clear from the holds of average size vessels in 1 hour. Asst. Surg. Faget, in reporting the observations collected during the fumigation of some 33 vessels, noted that 25 of the 33 were free of cyanide fumes within 1 hour after opening the holds, although 4 of the 33 were not clear of the gas at the end of 3 hours. Asst. Surg. Faget attributes the inconstancy of the dissipation of cyanide fumes partly to weather conditions (lack of wind, excessive humidity, low temperature) and ship construction, such as multiplicity of decks and small hatchways. It would appear that of the weather conditions, that of wind is the most important, a fair breeze materially hastening the ventilation of holds and other ship compartments.

Whatever danger attaches to cyanide gas occurs not at the time of the evolution of the gas nor at the opening up of the compartments, but is due to persons entering a fumigated compartment before the dissipation of the gas or dilution to a degree nontoxic to man. Artificial ventilation, therefore, following fumigation both by cyanide gas and by sulphur dioxide seems advisable both for economic reasons (expediting the loading of holds) and for the protection of persons working about the vessel. The device that has proven of greatest practicability of application is that known commercially as the "Aerothrust," a two-blade propeller, 32 inches in diameter, operated by a small gasoline-driven motor. According to Grubbs's observations, an Aerothrust fan of 3-horsepower engine attachment will displace 22,700 cubic feet of air per minute by direct application, or if transmitted through funicular chutes (canvas) 20 feet in length the displacement is reduced to 8,340 cubic feet. The observations at Boston quarantine station indicated that the holds of even the largest vessels, irrespective of weather conditions, when all hatchways are removed, can safely be entered one-half hour after the Aerothrust fan has been in operation. This device is portable, is of comparatively reasonable price, and seems to be best adapted for artificial ventilation of vessels.

VIOLATION OF QUARANTINE LAWS.

For the fiscal year ended June 30, 1917, the department passed on 73 cases involving violation of the act of February 15, 1893, due to failure of masters to present American consular bills of health. Of the total 37 were dismissed without penalty because of extenuating conditions, chief of which was the lack of an American consular representative at the foreign port of departure. In 36 cases mitigated

penalties were imposed, the total amount of fines collected being $1,675.

ASSISTANCE EXTENDED TO OTHER GOVERNMENT SERVICES.

During the year the facilities of the Boston quarantine station were in part extended to the Immigration Service for the purpose of interning some 300 German seamen. Quarters and transportation only were furnished, the Immigration Service attending to the maintenance and general supervision of these interned aliens. The Fishermans Island reservation was temporarily turned over to the Army. The quarantine reservation at Port Royal was also temporarily loaned to the Navy Department for use as a training camp. At Reedy Island quarantine station assistance was extended to the customs, immigration, and naval authorities in boarding vessels at that place, quarters being provided for the representatives of the customs and Immigration Service at the station. The facilities of the San Diego quarantine station were likewise extended to the forces of the United States Naval Reserve, and similar provisions were made at the Tampa Bay quarantine station for assisting the patrol forces in that neighborhood. The above is in accordance with Executive order dated April 3, 1917, as follows:

Under the authority of the act of Congress approved July 1, 1902, and subject to the limitations therein expressed, it is ordered that hereafter in times of threatened or actual war the Public Health Service shall constitute a part of the military forces of the United States, and in times of threatened or actual war, the Secretary of the Treasury may, upon request of the Secretary of War or the Secretary of the Navy, detail officers or employees of said service for duty either with the Army or the Navy. All the stations of the Public Health Service are hereby made available for the reception of sick and wounded officers and men, or for such other purposes as shall promote the public interest in connection with military operations.

WOODROW WILSON.

THE WHITE HOUSE,
April 3, 1917.

Assistance was also extended to the Immigration Service in making sanitary surveys of proposed detention camps for the internment of aliens, and the services of medical officers were furnished for such internment camps.

Table giving transactions at national quarantine stations for the fiscal year ended June 30, 1917.

Stations.	Vessels inspected.	Vessels spoken and passed.	Vessels quarantined.	Vessels fumigated.	Passengers and crews inspected.
Alexandria					
Beaufort					
Biscayne Bay	173	228		23	4,724
Bocagrande	71	61		1	314
Boston	522			126	44,175
Brownsville					[1] 6,279
Brunswick	64	3		30	1,436
Cape Charles	1,939		1	154	90,815
Cape Fear	30	2		16	917
Cedar Keys					
Charleston	142			19	3,937
Columbia River	35			1	964
Coos Bay					

[1] Border station. Does not include local travelers, who however were subject to cursory inspection.

Table giving transactions at national quarantine stations, etc.—Continued.

Stations.	Vessels inspected.	Vessels spoken and passed.	Vessels quarantined.	Vessels fumigated.	Passengers and crews inspected.
Cumberland Sound	42	.....	.....	11	575
Darien	5	.....	.....	.....	36
Delaware Breakwater	78	3	.....	1	1,486
Delaware River (Philadelphia)	1,228	36	.....	403	35,682
Eagle Pass	.....	.....	.....	.....	[1] 13,478
Eastport	663	.....	.....	.....	46,908
El Paso	.....	.....	.....	.....	[1] 44,289
Eureka	8	.....	.....	.....	.....
Fort Bragg	.....	.....	.....	.....	.....
Galveston	590	11	31	95	15,736
Georgetown	1	.....	.....	.....	8
Gulf	107	11	1	40	1,706
Hoquiam	.....	.....	.....	.....	.....
Key West	937	.....	3	38	71,865
Ketchikan	266	.....	.....	.....	13,365
Laredo	.....	.....	.....	.....	[1] 40,359
Mobile	504	.....	18	170	9,697
Monterey	.....	.....	.....	.....	.....
Morgan City (Atchafalaya)	.....	.....	.....	.....	.....
New Orleans quarantine	1,859	.....	97	177	67,379
New Orleans City	.....	.....	.....	762	.....
Newport	.....	.....	.....	.....	.....
Pascagoula	80	.....	.....	14	70
Pensacola	227	.....	2	72	5,405
Perth Amboy	91	.....	.....	32	2,293
Port Angeles	15	.....	.....	.....	190
Port San Luis	41	.....	.....	.....	1,523
Portland, Me	119	.....	.....	4	8,755
Port Royal	.....	.....	.....	.....	.....
Port Townsend	269	1	25	25	39,156
Providence	37	.....	.....	8	7,159
Provincetown	.....	.....	.....	.....	.....
Reedy Island	81	3	.....	.....	2,899
San Diego	528	.....	.....	1	13,669
San Francisco	751	6	2	347	76,784
Santa Barbara (Los Angeles)	.....	.....	.....	.....	.....
San Pedro (Los Angeles)	151	.....	.....	14	6,414
Savannah	231	.....	4	61	8,922
South Bend	8	.....	.....	.....	75
St. Andrews	44	.....	.....	23	.....
St. George Sound	3	.....	.....	.....	25
St. Johns River	146	.....	.....	30	3,097
St. Josephs	17	.....	.....	1	168
Tampa Bay	314	.....	.....	57	5,352
Tacoma	.....	.....	.....	40	947
Washington	.....	.....	.....	.....	.....
Bellingham, Wash	1	.....	.....	.....	.....
Nome, Alaska	13	.....	.....	.....	.....
Rio Grande City, Tex	.....	.....	.....	.....	[1] 4,725
Hidalgo, Tex	.....	.....	.....	.....	[1] 5,994
Total	12,431	365	184	2,796	709,770

Reports from National Quarantine Stations.

During the fiscal year ended June 30, 1917, a total of 12,431 vessels were inspected at the various quarantine stations in the United States. Of this number, 2,796 were fumigated, either for the destruction of mosquitoes as a precaution against the introduction of yellow fever, or for the destruction of rats and other vermin as a precaution against plague.

In addition, 365 vessels were spoken and passed, making a grand total of 12,796 vessels and 709,770 passengers and crews passing under the obervation of the service at ports in continental United States.

Following are the summaries of the operations at the various quarantine stations:

Alexandria, Va.—Acting Asst. Surg. Arthur Snowden in charge. No transactions. At Alexandria, Va., the quarantine inspection is also made of vessels destined to Washington, D. C.

Atchafalaya, La.—Post-office and telegraphic address, Morgan City, La. Acting Asst. Surg. W. T. McClellan in charge. No transactions.

Beaufort, S. C.—Post-office and telegraphic address, Chisolm, S. C. Acting Asst. Surg. C. G. Hay in charge.

No vessels were inspected at this station during the year. It is believed, however, that the operation of the phosphate mines in this vicinity and of the lumber interests, which has recently increased in activity, may, after the restoration of normal conditions, result in a renewal of shipping from foreign ports.

Bellingham, Wash.—Acting Asst. Surg. L. R. Markley reports 1 schooner inspected.

Biscayne Bay (Fla.) quarantine.—Post-office and telegraphic address, Miami, Fla. Acting Asst. Surg. J. M. Jackson in charge.

During the year 228 vessels were spoken and passed, 150 vessels were inspected and passed, and 23 were disinfected for the destruction of rats. All vessels were required to maintain rat guards on dock lines and to fend off. The total passengers and crew inspected was 4,724.

The fumigation of vessels continues to show low rat infestation, which it is believed is due to the periodic fumigations which are carried out at this station every three months. The old channel to the port has filled to such an extent as to prevent the regular steamer service between Miami and Nassau which ordinarily is carried on during the winter months. Completion of a new 18-foot channel and municipal docks, now in course of construction, will, it is believed, greatly increase the station work. Immigration from the Bahama Islands during the last two months of the fiscal year shows a marked falling off, chiefly attributable to the provisions of the new immigration law.

Boca Grande (Fla.) quarantine.—Post-office and telegraphic address Boca Grande, Fla. Acting Asst. Surg. G. E. Atwood in charge.

Summary of transactions.

Vessels entering port	71
Spoken and passed	61
Inspected and passed	9
Inspected and fumigated for destruction of rats	1
Officers and crew inspected	314

Boston (Mass.) quarantine.—Post-office and telegraphic address, Gallops Island, Boston, Mass. Surg. S. B. Grubbs in charge.

During the fiscal year ended June 30, 1917, the title to the Boston quarantine station, Gallops Island, was transferred to the Federal Government. Since June 1, 1915, the station has been operated by the service under a lease from the city of Boston.

Personnel and equipment: The personnel remains the same as last year except for the addition of two attendants in April. Material improvement was accomplished in equipment of station. Several of the large buildings have been painted on the exterior, and partly on the interior. Fire-fighting equipment and a new boiler have been

purchased. The boiler of the quarantine steamer *Vigilant* was practically rebuilt at a cost of nearly $2,500 and is now believed to be in excellent condition. Equipment for fumigation has been constantly changed and improved.

Quarantine operations: The quarantine business of the port, compared with last year, has decreased both as to number of ships and passengers, but the amount of fumigation has increased. Vessels arrive bringing cargo to Boston from practically all the plague-infected ports of Europe, Africa, South America, and Asia. As the waterfront is rat-infested it is realized that fumigation is practically the only defense and every effort has been made to improve the technique. To this end the methods of fumigation with both sulphur dioxide and hydrocyanic acid gas have been changed where improvement seemed possible and the results have been observed and recorded. This work is directly under the charge of Acting Asst. Surgs. F. X. Crawford and E. M. Looney.

The following methods are now in use: All vessels are treated throughout—superstructure with cyanide, using 5 ounces of sodium cyanide per 1,000 cubic feet for 1 hour exposure and holds with either cyanide 4 ounces per 1,000 cubic feet for 1½ hours' exposure or sulphur 2 pounds per 1,000 cubic feet with 12 hours' exposure or 3 pounds for 6 hours. After cyanide fumigation rats are used to determine if ventilation has been sufficient, after which one of the station force enters the parts fumigated. Artificial ventilation is used, which insures perfect aeration within a definite time regardless of weather conditions. Vessels from suspected ports arriving empty or with a small amount of cargo are fumigated with cyanide on arrival.

No passengers reach this port from places known to be infected with chlorea. The station laboratory is equipped to examine for cholera carriers when necessary.

No cases of typhus fever have been found but a constant vigilance is necessary. The method previously reported of killing lice in clothing and baggage by the vacuum cyanide method and on the body by the gasoline-soap spray and large shower bath have been tested out with interned German sailors and has proved satisfactory. On account of the small number of passengers arriving, most of which are inspected at Naples, it has not been necessary to so treat incoming immigrants.

Research: As a result of experimental work the following results have been reported to the bureau:

Rats or mice are the animals best adapted for testing the presence of cyanide fumes.

Artificial ventilation after cyanide fumigation is practicable and will save time.

The use of sulphur as a telltale in cyanide fumigation may be of advantage when artificial ventilation is not available, but should be used with caution, as concentrated cyanide is inflammable.

The efficiency of cyanide is increased approximately 50 per cent if the gas is kept in motion, but no practical method of accomplishing this on shipboard has been worked out.

Sodium cyanide deteriorates rapidly and should be stored in air-tight receptacles.

Studies on the relative efficiency of SO_2 and HCN for the purpose of killing rats on board ships are under way but not yet complete. Studies on the relative efficiency of SO_2 generators have been partially completed and a new type of sulphur burner will soon be ready. Experiments are under way with a generator constructed by the Roessler & Hasslacher Chemical Co. at the suggestion of the officer in charge of the Boston station. When perfected this generator, which remains on board the quarantine steamer, should materially reduce the time and labor necessary for fumigation.

After an extended inquiry into the merits. of several kinds of devices designed for rescue work in the presence of poisonous gases, the station has been equipped with the Draeger self-rescue apparatus. This is kept on board the quarantine steamer, and the crew has been drilled in its use.

Cooperation with other departments: At the request of the Commissioner of Immigration some 280 interned German sailors have been cared for at the station since April 30. One hospital—for officers' quarters—both barracks, dining room with kitchen, and bathhouse are used by them, and about one-half of the island has been allotted to them for gardens and recreation. In addition the Machine Gun Co. of the Ninth Massachusetts Regiment—about 75 strong—is on the island, performing guard duty.

By arrangement with the Boston health department the quarantine station will receive any contagious diseases they wish treated here.

By arrangement with the medical officers detailed for immigration duty the station will receive at their request nonquarantinable contagious diseases.

By arrangement with the marine hospital at Chelsea the station will receive any acute contagious disease from that hospital. During the year the marine hospital sent the following cases: Chicken pox 1, measles 8, poliomyelitis 2, mumps 1, peritonsillar abscess 1.

During the year an effort was made to secure adequate rat-proofing ordinances to apply to the city of Boston. Surg. Grubbs cooperated and assisted various civic bodies interested in securing this legislation. A bill was drafted and hearings were held before the joint committee on metropolitan affairs (legislative). No action was taken on the proposed bill, however, but it is still in the active files of the committee, and there is a possibility that it may later on become law.

Transactions: During the fiscal year ended June 30, 1917, a total o 522 vessels entered quarantine, as follows:

Steamers	502
Motor ships	6
Schooners	12
Bark	1
Ship	1
Total	522

Of this number 126 required fumigation, and were treated as f llows:

Fumigation with sulphur	50
Fumigation with hydrocyanic acid gas	65
Fumigation with sulphur and hydrocyanic acid gas	11
Total	126

In addition, five vessels were fumigated at the request of the Navy Department.

This is a decrease in the number of vessels but an increase in the number of those fumigated. The above vessels carried crews numbering 28,483 and 15,692 passengers.

The following number of detained persons were treated in hospital:

Observation	15
Bubo (observation for plague)	4
Measles	2
Varicella	4
Tonsillitis	2
Mastoiditis	1
Diabetes	1
Impetigo contagiosa	3
Pediculosis	1
Total	33

Brunswick (Ga.) quarantine.—Acting Asst. Surg. R. E. L. Burford in charge.

During the year 3 vessels were spoken and passed, 21 steamers and 13 sailing vessels were inspected and passed, 8 steamers and 22 sailing vessels were inspected, fumigated, and passed. There were 1,123 crew on steamers, 310 crew on sailing vessels, 3 passengers on steamers. No vessel was quarantined, and no quarantinable disease was found aboard any vessel in port.

Cape Charles (Va.) quarantine.—Post-office and telegraphic address, Fort Monroe, Va. Surg. H. McG. Robertson in charge.

The increase in the number of vessels arriving at the Cape Charles quarantine station since the beginning of the war, and noted in previous annual reports, continued during the fiscal year ended June 30, 1917. The total number of vessels which arrived at quarantine was 1,939, as compared with 1,851 during the year ended June 30, 1916, and as compared with 574 during the fiscal year ended June 30, 1914, an increase in three years of about 240 per cent.

Approximately one-half of the vessels arriving at the ports on Hampton Roads call for bunker coal, either on their voyages to European ports from ports in the West Indies, Central or South America, or from ports west of the Panama Canal, or from European ports bound for other points on this side of the Atlantic. Much of this shipping has been diverted to these ports because of the war, but another considerable portion because of the rearrangement of trade routes due to the opening of the Panama Canal.

It is thought that a conclusion of the war would not materially lessen the number of vessels arriving at Norfolk and Newport News for bunker coal. Of the other half of the vessels arriving at quarantine about two-thirds come for cargoes of coal for foreign ports, while the remainder call for orders or bring cargoes of nitrate, ore, cork, etc.

In handling the large number of vessels calling in Hampton Roads for orders, this station incidentally performs considerable quarantine work for other United States ports.

Very few vessels of the United States Navy entered quarantine during the year.

Reference to the annual report for 1916 shows that the Cape Charles quarantine station handled more vessels by nearly 25 per cent than any other United States port with the exception of New York.

It may be noted that the facilities for doing this work are entirely inadequate, when the number of vessels and the character of the waters of Hampton Roads are considered.

During the year there were 155 vessels fumigated for the destruction of rats or for both rats and mosquitoes. Owing to the haste in departure of the vessels only 2,655 rats were found killed. It is thought that a thorough search would have revealed very many more.

One vessel from a suspected yellow fever port was fumigated for the destruction of mosquitoes, after which this steamer loaded a cargo of coal under the supervision of the quarantine officer and immediately sailed for a foreign port. In this manner of dispatch this vessel was saved a detention of six days.

Sulphur only was used in fumigating vessels at this station, as there are no facilities for the detention of crews ashore at Old Point Comfort during the process of fumigation and this removal is considered necessary if cyanide is used.

One small vessel belonging to the United States Coast and Geodetic Survey was fumigated with hydrocyanic acid gas on request.

No quarantinable diseases were encountered during the year and no vessels were detained because of suspicious illness.

On February 13, 1917, the Secretary of the Treasury granted authority to the Secretary of War to mount guns on Fishermans Island and to use all wharves and buildings except that occupied by the caretaker of the quarantine station. Since March 30 the buildings have been used by a company of Coast Artillery and some equipment has been furnished them.

In view of the present importance of the ports served by the Cape Charles quarantine station and the confidently anticipated growth both of these ports, and the volume of their shipping an early readjustment of the boarding and detention facilities of the station should be made.

Fishermans Island, always inaccessible, and now indefinitely under Army control, can no longer be relied upon as a detention station. A suitable site for barracks and other buildings should be secured in easy reach of Old Point Comfort.

The work of the station is now done under difficulty and any increase therein, especially in the fumigation of vessels, will put the present equipment under an excessive strain.

The contract for the erection of a house for the medical officer in charge was awarded some weeks ago to a local contractor and the work of erecting this dwelling was recently begun.

Some improvements are being made in the sanitary equipment of the office on the wharf at Old Point Comfort, and in the equipment of the hulk *Chase*.

Summary of transactions.

Total number of vessels arriving at quarantine	1,939
Number of steamers boarded and passed	9
Number of steamers inspected and passed	1,707
Number of steamers fumigated and passed	124

Number of steamers fumigated and detained	1
Number of sail vessels inspected and passed	68
Number of sail vessels fumigated and passed	30
Number of crew on steamers	84,312
Number of crew on sail vessels	1,427
Number of passengers on all vessels	5,076

Cape Fear (N. C.) quarantine.—Post-office and telegraphic address, Southport, N. C. Acting Asst. Surg. J. A. Dosher in charge.

Transactions.

Total vessels entering quarantine	30
Total steamers inspected and passed	12
Steamers spoken and passed	2
Steamers fumigated	14
Sailing vessels fumigated	2
Total number of crews inspected	917

The number of vessels arriving at this port was further reduced during the past year on account of the war. The exports of cotton, lumber and naval stores which under normal condition are very important, have practically ceased. The nitrate trade from the west coast of South America has shown some increase during the past six months; all steamers fumigated, with one exception, brought cargoes of nitrates. During the year a large wharf has been completed at a cost of about $25,000, also an electric-lighting plant. These improvements have greatly increased the efficiency of the station.

An effort has been made to impress upon the shipping interests the necessity of using rat guards, breasting off vessels and raising gangplanks at night. The result has been all that could be desired; there has been no friction, and the cooperation of everybody interested has been satisfactory. All masters receive written instructions as to needed precautions before proceeding to Wilmington, N. C., and when deemed necessary the service officer at that port is notified by wire of the arrival of the vessel in order that he may inspect the vessel from time to time to ascertain whether the instructions received at quarantine are observed.

Cedar Keys (Fla.) quarantine.—Acting Asst. Surg. J. W. Turner in charge. No transactions.

Charleston (S. C.) quarantine.—Surg. H. M. Manning in charge.

The amount of shipping at this port has been less than usual on account of the war. However, Charleston has developed into quite an important coal port. A great many ships call at this port for bunker coal. Some coal is also exported.

Transactions.

Vessels entering quarantine	142
Steamers inspected and passed	122
Sailing vessels inspected and passed	20
Steamers fumigated	10
Sailing vessels fumigated	9
Number of crew inspected	3,921
Number of passengers inspected	16

The station received two cases only of smallpox from the health officer of the city of Charleston during the past year as compared with 22 during the previous year and 48 during the year 1914–15.

This is due to the decrease in the prevalence of this disease in this region, caused by the efforts of the local health authorities in vaccinating nonimmunes.

Columbia River (Oreg.) quarantine.—Post-office and telegraphic address, Astoria, Oreg. Surg. H. G. Ebert in charge.

During the year ending June 30, 1917, 21 steamers, 11 sailing vessels, and 3 unrigged barges were inspected. One vessel was fumigated at the station and four on discharge in Portland, Oreg. Nine hundred and sixty-four passengers and crew were inspected.

One case of smallpox was removed from a coasting vessel and treated at the quarantine station.

One case of scarlet fever was admitted to quarantine hospital at request of the officer in charge of the marine-hospital station at this port.

A small amount of infected bedding was disinfected at request of local health authorities.

Antirat precautions have been enforced as heretofore in Portland, Oreg., by the harbor police of that city.

The members of a coasting vessel were vaccinated, and by request vaccination was done aboard a cannery vessel bound for Alaska.

There has been a further marked decrease this year in vessels subject to quarantine inspection; last year showed a marked falling off from the year before. Last year 32 steamers and 60 sailing vessels were boarded, a total of 92 vessels; this year shows 21 steamers and 11 sailing vessels, also 3 unrigged barges, a total of 35, amounting to but little over a third of last year's work and about a quarter of the year before.

Sailing vessels were confined to lumber schooners returning empty from Australian ports.

Steamers were practically all vessels from the Puget Sound ports via Nanaimo, British Columbia, for coal.

Coos Bay (Oreg.) quarantine.—Post-office and telegraphic address. North Bend, Oreg. Acting Asst. Surg. Ira B. Bartle in charge. No transactions.

Cumberland Sound (Fla.) quarantine.—Post-office and telegraphic address, Fernandina, Fla. Acting Asst. Surg. J. L. Horsey in charge.

The transactions at this station for the fiscal year ending June 30, 1917, were considerably below the average of former years, due largely to the fact that the shipments from the hard rock phosphate mines in Florida, rosin, and spirits of turpentine, formerly sent out through the port of Fernandina to foreign countries, have almost entirely been suspended on account of the European war.

A total of 42 vessels were inspected during the year. No sickness of a quarantinable nature was found amongst the personnel inspected.

Darien (Ga.) quarantine.—Acting Asst. Surg. P. S. Clark in charge. During the year five sailing vessels were inspected and passed. These vessels carried a total of 36 crew.

Delaware Breakwater (Del.) quarantine.—Post-office and telegraphic address, Lewes, Del. Acting Asst. Surg. G. G. Hart in charge. A total of 78 vessels was inspected during the year. Three vessels were spoken and passed and one fumigated. Passengers and crews on vessels totaled 1,486.

Delaware Bay and River quarantines.—Post-office and telegraphic address, Philadelphia, Pa. Senior Surg. Fairfax Irwin in charge.

From July 1, 1916, until May 16, 1917, the quarantine work on the Delaware River, with the exception of that done at the Breakwater and Reedy Island, had been continued to be conducted at Marcus Hook, in conjunction with the work of the State officials there. The fumigation of vessels for the destruction of rats at this station was done by the sulphur method. A good part of this fumigation was carried out at the docks, since this could not be done at Marcus Hook on account of cargoes of inward-bound vessels. The night inspection of vessels had been continued as before.

On May 16, 1917, the station at Marcus Hook was abandoned and boarding and inspecting of incoming vessels from that date has been carried on at Reedy Island, in conjunction with Navy officers and other Federal officials, under the direction of Senior Surg. Fairfax Irwin, until June 18, 1917, after which date this work was separated from the Philadelphia office and placed under the charge of Passed Asst. Surg. J. R. Hurley, with headquarters at Reedy Island.

The statistics in connection with the quarantine transactions at Philadelphia, Marcus Hook, and Reedy Island during the fiscal year ended June 30, 1917, will be embodied in the medical officer's annual report from Reedy Island quarantine.

Eastport (Me.) quarantine.—Acting Asst. Surg. J. L. Murphy in charge. During the year 663 vessels were inspected and passed. These vessels carried 46,908 passengers and crew. No quarantinable diseases were found on any arriving vessels.

Eureka (Cal.) quarantine.—Acting Asst. Surg. C. C. Falk in charge. Eight vessels were inspected and passed.

Galveston (Tex.) quarantine.—Surg. R. L. Wilson in charge.

The station is located in Galveston Bay about two miles from the centrally located wharves of Galveston. Vessels are inspected not only for Galveston, but also for Texas City, Port Bolivar, Houston, and other points in Galveston Bay and tributaries. The station was opened for transactions July 19, 1915. (See last annual report for description.)

The State of Texas maintains a quarantine at Galveston and fees are collected. Priority in boarding and treatment of vessels is exercised by the United States Public Health Service.

Sulphur and cyanide are used in the fumigation of vessels. Cyanide is almost invariably used in rooms, while sulphur is often used in holds.

Personnel held in detention, whether aboard ship or at the station, were in most cases from ports in Mexico and detained for observation on account of yellow fever.

Transactions.

Vessels inspected and passed	559
Vessels inspected and held to detain crew six days	31
Vessels fumigated for rodent destruction	90
Vessels fumigated for mosquito destruction	5
Vessels fumigated by sulphur dioxide	46
Vessels fumigated by cyanide gas	49
Number of rodents collected after fumigation (search incomplete)	705
Number of crew inspected	15,262
Number of passengers inspected	474
Number of persons detained at station	460
Number of suspected cases treated at station hospital	28
Number of port sanitary statements issued	1,067

Georgetown (S. C.) quarantine.—Acting Asst. Surg. M. P. Moorer in charge. One schooner was inspected and passed. This vessel carried eight passengers and crew.

The service property at this station, consisting of medical officer's quarters, attendants' quarters, and two outbuildings, is in a poor state of repair, the storm of July 13, 1916, having torn away guttering and wire screening. There is no drinking water except from a 15-foot driven well, which is brackish. Cistern requires relining and manhole cover.

No repair work of consequence has been done since the year 1911, although efforts have been made and estimates submitted. The station has been placed upon the list of "inspection stations," and it is, therefore, the intention of the medical officer and custodian, during the period of the war, to ask for only necessary repairs to prevent deterioration under Sec. XIII, "Instructions to custodians."

Gulf (Miss.) quarantine.—Post-office and telegraphic address, Gulfport, Miss. Acting Asst. Surg. W. R. P. Thompson in charge.

Transactions.

Sailing vessels entering quarantine	74
Steamers entering quarantine	33
Total vessels entering quarantine	107
Vessels inspected and passed	43
Vessels spoken and passed	11
Vessels fumigated	40
Vessels held for observation	1
Total crew inspected	1,705
Passengers inspected	1
Stowaways inspected	4
Rats killed by fumigation	647

On July 5, 1916, the buildings and station property at Ship Island were considerably damaged by a severe hurricane, chimneys being blown down, windows broken, and some of the buildings partially unroofed. While the minor damage has been repaired, the wind and wave action resulted in the destruction of various sand dunes on the island which heretofore have offered considerable protection to the station buildings. Several hundred feet of the main wharf had the decking torn off and some of the piling washed out. The wharf, however, has since been repaired to the extent necessary for the enforcement of quarantine procedure at the island.

The fumigating barge was blown out to sea and lost, and the launch *Hermes* was driven ashore and damaged beyond all possibility of repair, the engine of the vessel, however, being removed by the station force in fairly good condition. Both the launch *Evelyn* and the launch *Helen* suffered slight damage, but have since been repaired.

Some additional damage was caused by a storm in September, 1916, and as the result of the combined damage of the hurricane of July and the storm of September it may be stated that the station buildings are more exposed to hurricane damage than in the past.

On December 20, 1916, the quarantine inspection of vessels was transferred from Ship Island to Gulfport, the station at Ship Island being retained with unimpaired facilities under the custodianship of

two attendants for use when necessary for the detention and treatment of infected vessels. The inspection of vessels is now performed from Gulfport, as likewise is the routine fumigation of vessels for the destruction of rats on noninfected vessels. This change of procedure resulted in a very material economy, and it does not appear to have impaired the efficiency of service operations. It is contemplated that any vessel arriving with disease on board or from an infected or suspected port shall, when detention is deemed necessary, be remanded to Ship Island for appropriate treatment. The change in quarantine procedure likewise has resulted in the expedition of shipping interests.

Ordinances have recently been enacted at Gulfport governing the docking of vessels with a view to preventing the escape of any rats. These ordinances are in the nature of "fending off" and "rat-guarding" measures.

In addition to the quarantine duties, the medical officer in charge at Gulfport has taken over the duties pertaining to the extension of service relief to service beneficiaries.

Hoquiam (Wash.) quarantine.—Acting Asst. Surg. R. F. Hunter in charge. No transactions.

Key West (Fla.) quarantine.—Acting Asst. Surg. S. D. W. Light in charge.

During the fiscal year ending June 30, 1917, a total of 870 steam vessels carrying crews aggregating 42,020 persons and 29,354 passengers, and 67 sailing vessels with crews totaling 435, and 56 passengers, came under the jurisdiction of this station from foreign ports.

Seventeen steamers and 21 sailing vessels were fumigated during the year and 3 steamers were held in quarantine.

The personnel of the station consists of an acting assistant surgeon and two attendants, and the equipment of a 36-foot boarding launch and a detention barge; the floating hospital *Wistaria*, an old Lighthouse Service tender, manned by two attendants, and capable of housing about a score of patients.

No quarantinable diseases were encountered during the year.

Ketchikan, Alaska.—Acting Asst. Surg. H. C. Story in charge.

During the year 266 vessels were inspected, carrying a total of 13,365 passengers and crews, and 1,032 port sanitary statements were issued. One vessel arrived with a case of smallpox on board. The patient was isolated, personnel vaccinated, and vessel fumigated.

Mobile (Ala.) quarantine.—Asst. Surg. T. J. Liddell in charge. Post-office and telegraphic address, Fort Morgan, Ala.

On July 5, 1916, the station was swept by a hurricane of extreme intensity. The boarding launch *Zeta* was damaged beyond repair and four yawlboats lost, but the buildings of the station were only slightly damaged, although all are built over the water.

On October 18, 1916, the station was swept by another hurricane and minor damage done.

The barge *Chipman*, an old hulk used for fumigation purposes, was towed into shallow water after being badly damaged in a heavy gale on November 15, 1916, and it sank immediately. The fumigating facilities, therefore, are very inadequate at this station as all vessels have to be fumigated by carrying the materials in small boats.

Cyanide was first used in fumigating at this station on November 17, 1916, and the station laboratory has been renovated to meet the needs of ordinary laboratory tests incidental to quarantine work.

Alien seamen were examined in accordance with the new immigration law, and certified or passed at this station, except those to be held for further medical examination.

Transactions.

Steamers inspected and passed	244
Sailing vessels inspected and passed	90
Vessels detained in quarantine	18
Vessels fumigated	170
Passengers and crew inspected	9,697
Number of rodents collected	1,156

New Orleans (La.) quarantine.—Passed Asst. Surg. C. M. Fauntleroy in charge. This station, located about 90 miles below the city of New Orleans, and about 16 miles from the Gulf of Mexico, on the east bank of the Mississippi River, is of great importance in the prevention of admission into the United States of dangerous epidemic diseases, such as yellow fever, plague, typhus fever, and malignant smallpox, all of which diseases are endemic in a number of ports visited by vessels which call regularly at New Orleans. The principal shipping at New Orleans is from tropical American ports. The inspection of these vessels, made at the station, consists in the examination of papers, a visual inspection, and the taking of the temperature of each and every person on the vessels. Two medical officers are detailed to conduct the examination of all vessels arriving at the quarantine station between the hours of sunrise and midnight, approximately 19 to 20 hours of the day. Special care is exercised to detect mild or undeveloped cases of yellow fever among the personnel on vessels arriving from tropical American ports. All persons exhibiting any considerable rise of temperature which can not be accounted for at the time of the inspection are immediately removed to the hospital at quarantine for observation and diagnosis, the vessel being detained at the station pending the determination of the cause of the fever.

On August 9, 1916, the Danish steamship *Borglum*, from Progreso, Mexico, arrived with two members of the crew suffering from yellow fever. The two sick men were removed to the quarantine hospital and carefully protected from mosquitoes by screening, and the vessel was fumigated for the destruction of mosquitoes, and detained in quarantine for a period of six days for observation. No further cases of yellow fever developed during the period of observation. Both of the cases in the hospital made good recovery and were discharged in about two weeks from the date of their admission to the hospital.

During the year 18 persons were removed to the quarantine hospital for observation and diagnosis, from vessels arriving at the station.

A total of 618 aliens were examined and passed under the immigration law, and 19 were remanded to New Orleans for further observation.

During the year 41,905 temperatures were taken of persons arriving at quarantine on vessels bound for New Orleans.

Summary of transactions.

	Steamships.	Sailing vesse s.	Total.
Inspected and passed	1,218	38	1,256
Inspected and held for fumigation	134	34	168
Inspected and held to complete six days	81	.....	81
Fumigated and held six days	9	7	16
Fumigated and passed	134	27	161
Fumigated with sulphur dioxide	88	34	122
Fumigated with cyanide gas	7	.....	7
Fumigated with sulphur and cyanide gas	48	.....	48
Remanded to New Orleans for fumigation	44	.....	44
Boarded and passed	3	.....	3
Number of crew inspected	55,663	882	56,545
Number of passengers inspected	11,778	8	11,786
Number of stowaways on vessels inspected	48	.....	48
Total number ships inspected	1,719	140	1,859
Total number of persons inspected	66,489	890	67,379

Nome, Alaska.—Acting Asst. Surg. D. S. Neuman, in charge, reports that 13 vessels were inspected from June 1 to November 1, 1916, and from March 1 to June 30, 1917.

Pascagoula (Miss.) quarantine.—Acting Asst. Surg. W. A. Cox in charge.

Transactions.

Vessels arriving from foreign ports	80
Steamers inspected and passed	7
Sailing vessels inspected and passed	73
Steamers fumigated	2
Sailing vessels fumigated	12
Crew inspected	679
Passengers inspected	21
Stowaways	3
Total number of rats killed as result of fumigation	25

Pensacola (Fla.) quarantine.—Asst. Surg. H. A. Spencer in charge.

The personnel of all vessels arriving at this port, excepting those that were coastwise, were carefully inspected. All fumigations were done with 4 per cent sulphur with an exposure of 6 hours. In a total of 72 vessels fumigated 245 rats were recovered from the holds and 33 rats and 1 mouse from the living quarters. Careful search would probably have revealed many more had time permitted. Fourteen vessels were fumigated when empty, alongside the wharf in Pensacola, and 1 in the bay about 4 miles from the station. The fumigation of all other vessels needing this treatment was done at anchor near the quarantine grounds.

There are three conditions affecting the boarding of vessels at this port: First, the distance of the station from the ship channel (approximately 5 miles); second, fog; third, lack of outside telephone communication.

These difficulties, excepting the fogs, have been overcome to a great degree by careful watchfulness for vessels on the part of the station personnel, and subordinating all other duties to that of expediting shipping.

Passed Asst. Surg. C. P. Knight was in charge of the station from July 1 to October 25, 1916. During his detail two severe tropical hurricanes passed over the station causing damages that amounted to nearly $20,000. The major part of these repairs have

been made under contract, but much yet remains to be done before a high state of efficiency can be attained.

The steam chamber used for disinfection of clothing, etc., was sold at public auction on October 5, 1916, as unserviceable.

Transactions.

	Number.
Steamers inspected and passed	67
Steamers fumigated and passed	21
Steamers fumigated and detained six days	1
Steamers given provisional pratique	14
Sailing vessels inspected and passed	88
Sailing vessels fumigated and passed	32
Sailing vessels fumigated and detained six days	1
Sailing vessels given provisional pratique	3
Naval vessels passed on medical officer's certificates	2
Total	229
Total vessels fumigated	72
Crew inspected	5,383
Passengers inspected	7

Perth Amboy (N. J.) quarantine.—Acting Asst. Surg. C. W. Naulty, jr., in charge. During the past year there was a marked decrease in the number of vessels inspected, many vessels usually calling at Perth Amboy having been diverted for various reasons to other ports. During the year 91 vessels were inspected and passed. These vessels carried a total of 2,293 crew and no passengers. Thirty steamers and 2 sailing vessels were fumigated. As noted in previous annual report, 16 of the steamers were fumigated by the Trinidad Line officials under service supervision, at a great saving to the service, as their vessels require usually 1½ to 2 barrels of sulphur for a complete fumigation. No quarantinable diseases were found on any arriving vessels. (Report of medical relief furnished to service beneficiaries will be found under the heading of "Marine hospital and relief.")

Port Angeles (Wash.) quarantine.—Acting Asst. Surg. Frederick T. Hyde in charge.

Fifteen sailing vessels were inspected and passed during the fiscal year ending June 30, 1917. One of these arrived in distress, and it was necessary for her to proceed without delay to a dry dock near Seattle. She was granted provisional pratique with the understanding that she would be fumigated by the service officer at Seattle for destruction of rats and other vermin. These vessels carried a total of 186 members of crews and 4 passengers.

Port San Luis (Cal.) quarantine.—Acting Asst. Surg. C. J. McGovern in charge. During the fiscal year there were inspected 41 steamers, carrying a total of 1,523 in crews. There were no quarantinable diseases discovered, nor were there any other transactions.

Portland (Me.) quarantine.—Surg. E. K. Sprague in charge. During the year 119 steamers and sailing vessels were inspected and passed. Four steamers, although not from ports known to be infected with plague were thought to require disinfection for the safety of public health, and they were treated accordingly. Thirty rats were collected following the fumigations, none of which showed signs of plague infection at autopsy. There were 7,717 members of crews, 269 passengers, and 769 returning cattlemen. No evidences of quarantinable diseases were discovered among the number.

Port Townsend (*Wash.*) *quarantine.*—Passed Asst. Surg. Baylis H. Earle in charge.

Two hundred and eight steamers were inspected and passed and 11 detained, and 36 sailing vessels were inspected and passed and 14 detained. The steamers carried a total of 17,703 members of crews and 20,830 passengers and the sailing vessels a total of 612 members of crews and 11 passengers. The vessels detained were fumigated with sulphur dioxide gas by the pot method for the destruction of rats and other vermin. The work was done in the Bay of Port Townsend except in the case of the United States lighthouse tender *Heather*, which was sent to the Diamond Point quarantine station, 1 member of the crew being ill of smallpox. The crew were removed to barracks on shore, bathed and vaccinated; all rooms, spaces, etc., on the vessel were fumigated; and the sick man was kept in isolation until well, when he was returned to the vessel, having been bathed and his effects disinfected.

Eighty-one steamers and 2 sailing vessels bound for Seattle and 12 steamers and 4 sailing vessels bound for Tacoma were granted provisional pratique with the understanding that they would be fumigated at these ports when empty, the service officers there being notified by telegraph or letter.

Between September 23, 1916, and February 22, 1917, 31 vessels from the Orient were required to stop at the Diamond Point quarantine station and disembark their steerage passengers for bacteriological examinations for cholera carriers. Two thousand seven hundred and sixty were thus detained on an average of 4 days. The examinations were made in the laboratory of the marine hospital in Port Townsend, Surg. B. J. Lloyd, of the service office in Seattle, being detailed to assist the station officers in the work. No carriers were found.

Forty-one cases of chicken pox developed among the detained passengers of one of these steamers, the *Sado Maru*, which arrived on January 5, 1917. These were isolated and further spread of the disease prevented.

Providence (*R. I.*) *quarantine.*—Surgeon D. E. Robinson in charge.

The number of vessels arriving at this port has increased slightly over the last fiscal year, with a corresponding increase in the number of crew and passengers. No quarantinable diseases have been encountered during the year.

Only one passenger steamer from foreign ports has entered this port, that being the steamship *Roma* of the Fabre Line, which has made regular trips between Lisbon and the Azores and Providence, bringing 5,757 passengers.

Other vessels arriving during the year have brought oil from Tampico, logwood from the West Indies, salt from Turks Island, and lumber from Nova Scotia. It is expected that in the near future a new line of oil-carrying steamers will be calling here on a regular schedule, making a total of five oil terminals at this port.

Summary of transactions.

Vessels entering quarantine	37
Vessels inspected and passed	37
Vessels inspected and fumigated	8
Total number of crews inspected	1,402
Total number of passengers inspected	5,757
Number of port sanitary statements issued	22

Reedy Island (Del.) quarantine.—Post-office address. Port Penn, Del. Telegraphic address, Reedy Island, Del. P. A. Surg. J. R. Hurley in charge.

The Reedy Island quarantine station has been in reserve for purpose of detention during the major portion of the year with Pharmacist F. L. Brown in charge, the quarantine boarding work having been done at Marcus Hook. On June 10 the station was reopened as an active quarantine station, Asst. Surgs. W. M. Jones and R. L. Allen being transferred from Marcus Hook to Reedy Island for boarding duty. On June 19 Passed Asst. Surg. J. R. Hurley assumed charge of the station, Asst. Surg. Allen being relieved upon his arrival. One June 26 the steam tug *Neptune* arrived from New Orleans, having been returned to the station for duty as a boarding and fumigating vessel. The facilities of the station while in reserve were not required until May 2, when the U. S. S. *Connecticut* arrived for fumigation and disinfection, having on board cases of measles, mumps, pneumonia, and meningitis. Twenty-five cases of the several diseases were admitted to hospital for treatment and 300 persons detained for examination and observation.

Various repairs and improvements have been made to the station during the past fiscal year to improve its efficiency for quarantine purposes.

The following is a summary of the service operations at Marcus Hook quarantine from the beginning of the fiscal year to June 9, 1917, when the work was discontinued there, and at Reedy Island quarantine station from June 10 to the end of the fiscal year:

Quarantine transactions.	Marcus Hook, July 1, 1916, to June 9, 1917.	Reedy Island, June 10 to 30, 1917.	Total.
Number of vessels spoken or boarded and passed	36	3	39
Number of sailing vessels inspected and passed	88	2	90
Number of sailing vessels fumigated for destruction of rodents	37	.....	37
Number of steamers inspected and passed	878	78	956
Number of steamers fumigated	225	1	226
Number of crew on sailing vessels inspected	1,212	28	1,240
Number of crew on steamers inspected	34,059	2,784	36,843
Number of passengers inspected on all vessels	401	87	488
Number detained in quarantine	1	.....	1
Number of vaccinations performed	43	.....	43
Number of steamers fumigated at Philadelphia after discharge of cargo	.....	.....	141

San Diego (Cal.) Quarantine.—Surg. J. S. Boggess in charge.

Quarantine operations at this station corresponded to those of previous years, both in the magnitude of the work and nature, the larger proportion of vessels inspected being small motor craft plying between San Diego and the ports of Lower California.

Summary of transactions.

Motor boats inspected	462
Naval vessels inspected	43
Steam vessels inspected	23
Sailing vessels inspected	0
Total crew inspected	11,868
Total passengers inspected	1,801
Port sanitary statements issued	689

No vessels were treated for quarantinable disease.

Assistance was rendered to the Navy Department in the treatment of the U. S. S. *Pueblo*, upon which an epidemic of measles developed. The facilities of the station were utilized in disinfecting the personal effects of patients and contacts. Another naval vessel was fumigated for the destruction of vermin. The marine railway of the station has been used by the Army quartermaster and the adjacent naval coaling station for the purpose of docking small craft. Berthing facilities have also been extended to Army and naval vessels.

It is probable that there will be a considerable increase in the maritime traffic of this port in the near future, due to the construction of the San Diego and Arizona Railway between San Diego and Yuma, Ariz., at which latter place connection will be made with the Southern Pacific Railroad, thus establishing freight and passenger connections with eastern points. The traffic of the port will also probably be increased by reason of the enlargement of various governmental activities in the vicinity of San Diego, Cal., especially those of the Army and Navy.

The detention barracks (building No. 12) are at present without adequate sleeping arrangements, and for this purpose it is recommended that standee bunks be supplied, space being available for approximately seventy 3-tier bunks, accommodating about 200 persons.

The station laundry likewise will require increased equipment, including a washer, mangle, and centrifuging extractor.

Recently the water service of the city has been extended to the station, and plans are under way for the reconstruction of the station water distribution system so that the entire station may be supplied from the city main, the old reservoir on the station being retained as a reserve supply in event the city system should at any time be temporarily out of commission.

San Francisco (Cal.) quarantine.—Post-office and telegraphic address, Angel Island, Cal.

Surg. W. A. Korn, in charge, reports that during the fiscal year ended June 30, 1917, 757 vessels were passed, of which number 727 were inspected and passed, 24 boarded and passed, and 6 spoken and passed. Three hundred vessels arrived during the year from plague and cholera ports, and 144 vessels from yellow fever ports. Seventy-six thousand seven hundred and eighty-four persons were inspected, of whom 41,537 were members of crews of steam vessels, 1,797 members of crews of sailing vessels, and 33,450 passengers. Three hundred and forty-seven vessels were fumigated, of which 274 were steam vessels, 7 motor ships, and 66 sailing vessels. Two hundred and twenty-six vessels were fumigated with hydrocyanic acid gas. One hundred and nineteen vessels were fumigated with sulphur dioxide. Two vessels, having had smallpox aboard, were disinfected.

As a result of these fumigations, 3,385 rats and 705 mice were killed, identified as follows:

Mus rattus	692
Mus alexandrinus	923
Mus norvegicus	79
Unidentified	1,691
Mus musculus	705

One hundred and thirteen vessels were not searched after fumigation.

Thirty-seven vessels were fumigated by request of the owners, or agents, for the destruction of rats and vermin.

The steamship companies at this port prefer the cyanide method of fumigation, notwithstanding the high cost of cyanide and the restrictions put upon its use.

Beginning October 4, 1916, the examination of steerage passengers from China and Japan for cholera carriers was carried on until February 21, 1917, when it was discontinued by bureau order. This work was under the supervision of Passed Asst. Surg. C. L. Williams. Three thousand four hundred and forty-nine immigrants were examined but no cholera carriers were found.

Among quarantine transactions the following were noted:

January 9, 1917, the American steamship *Venezuela* arrived with one case of smallpox among the steerage not isolated. All on board were vaccinated, and the vessel and baggage disinfected, the steerage, 78 in number, were removed to the station, bathed, clothing and baggage disinfected, and held under observation 14 days. No further cases developed and the patient recovered.

March 12, 1917, two cases of smallpox were removed from the immigrant hospital. These cases arrived the previous week on the steamship *China* from Hongkong, and had been under treatment for uncinariasis for a week before the eruption appeared. Both cases recovered.

Fourteen contacts of the above were also brought over from the immigrant hospital, bathed, vaccinated, clothing and baggage disinfected and returned after the quarters which they had occupied were disinfected.

March 20, 1917, one case of smallpox was removed from the steamship *Rose City* which arrived from Portland, Oreg. The usual treatment of vaccination, bathing, and disinfection of clothing, baggage, and vessel, was carried out.

Cooperation with other Government services:

Immigration Service.—The steamship *Argonaut* has made trips in place of the steamship *Angel Island* during the time that the latter vessel was cleaning boilers, approximately once every six weeks. Also during the period that this vessel was undergoing an annual overhauling.

Bureau of Agriculture.—The steamship *Argonaut* frequently makes special trips to carry the fruit inspector to vessels arriving particularly from the Hawaiian Islands.

Customs Service.—The customs boarding tug *Golden Gate* having been taken over by the Navy, during the present emergency, the *Argonaut* now takes out the customs inspectors to arriving vessels.

Army: Fort McDowell (casual camp).—Approximately 6,500 blankets, 1,000 mattresses and pillows altogether, with uniforms and miscellaneous personal laundry, including surgical towels, etc., from the camp hospital, have been disinfected with steam.

Summary of transactions.

Vessels inspected and passed	727
Vessels boarded and passed	24
Vessels spoken and passed	6
Vessels detained in quarantine	2
Vessels from ports infected with plague and cholera	300
Vessels from ports infected with yellow fever	144
Total crew inspected	43,334
Total passengers inspected	33,450

Los Angeles (Cal.) quarantine and subports.—Senior Surg. S. D. Brooks in charge.

This station includes three ports for quarantine inspection of vessels—San Pedro, Redondo, and Santa Barbara (including Gaviota).

Transactions.

	San Pedro.
Steamers inspected	136
Motor vessels inspected	11
Barges inspected	4
Total vessels inspected	151
Vessels fumigated	14
Total passengers, crews, and stowaways	6,414

No case of quarantinable disease was found on a vessel during the year.

Rat guards were placed on all vessels from South American and Asiatic ports while at dock, and daily inspection was carried out to insure their retention. Fumigation of such vessels for destruction of rats was usually deferred on account of perishable cargo or because the holds were completely filled, but all cargo being unloaded was inspected for evidence of rats.

St. Andrews (Fla.) quarantine.—Acting Asst. Surg. J. A. Wells in charge.

During the fiscal year there has entered this port from foreign ports a total of 44 vessels, and of that number 41 were sailing vessels or barges and 3 were steam vessels. Of the total vessels entering quarantine it was necessary to fumigate 23, all fumigations being for rodent destruction.

There has been a decrease in the number of vessels entering this port from foreign ports during the last fiscal year, due to shortage of vessels.

St. Georges Sound (Fla.) quarantine.—Post-office and telegraphic address, Crawfordville, Fla.

Acting Asst. Surg. L. W. Holloway reports that there were 3 vessels passed through quarantine at St. Georges Sound quarantine, Carrabelle, Fla., during the year ended June 30, 1917, all of which were inspected and passed.

There was no disease on board any of the ships entering, all being in first-class sanitary condition.

Shipping through this port is less even than the preceding year, due, as is obvious, to the continuation of the war and the scarcity of bottoms. One of the mills located at this point has recently resumed business and has a capacity of 50,000 feet per day.

St. Johns River (Fla.), quarantine.—Post-office and telegraphic address, Mayport, Fla. Acting Asst. Surg. Neil Alford in charge.

A report of the loss by fire of the office with all of the records of the station therein was made to the bureau immediately after the occurrence of the same on the 14th day of May, 1917. On account of the loss of these records it will not be possible to render a complete report. The data available in regard to the arrival at quarantine

of foreign vessels has been furnished through the courtesy of the deputy collector of customs at Jacksonville and is as follows:

	Number inspected.	Number of crew.	Stowaways.	Passengers.
Number of steamships	70	2,206	5	[1] 400
Number of sailing vessels	76	490	2	
Total	146	2,696	7	[1] 400

[1] Approximately.

The above table includes 7 sailing vessels and 1 steamship from Porto Rico. Approximately 30 steam and sailing vessels were fumigated for the destruction of rats and other vermin. Sulphur was used as a fumigant, 3 pounds per 1,000 cubic feet of space with 5 hours' exposure with good results.

No quarantinable diseases were found. One case of typhoid fever, a few cases of malaria, and several cases of gonorrhea were found among the different crews.

The station is provided with a 25-foot boarding launch, *Sea Tern*. With the exception of a minor overhauling of the engine it is in excellent condition and has been during the past year. The boathouse which has been used in the care of the launch *Sea Tern* was leased from the Florida East Coast Railway Co. at a monthly rental of $25. Office room was furnished at a monthly rental of $5. The station has only one attendant, whose duties are engineer and boatman, assisting in fumigations of vessels, and caring for the station property.

St. Joseph (Fla.) quarantine.—Post-office and telegraphic address, Port St. Joe, Fla. Acting Asst. Surg. B. S. Stutts in charge.

During the year 17 vessels were inspected and 1 vessel fumigated. These vessels carried 168 passengers and crew.

Tampa Bay quarantine (Fla.).—Acting Asst. Surg. B. B. Blount in charge. Post-office and telegraph address, Fort de Soto, Fla.

Transactions.

Vessels entering quarantine	314
Vessels inspected and passed	257
Vessels fumigated and passed	57
Passengers inspected	681
Members of crew inspected	4,671

There were no quarantinable diseases found during the year.

During the year examination of crew and passengers was made for immigration purposes, of which 8 cases were certified.

There were 212 dead rats found after the fumigations. It is impossible to make a thorough rat survey, for the reason that nearly all vessels leave the station before the fumes are sufficiently dissipated to allow the performance of this work.

All fumigations are done with sulphur by the pot method.

The following buildings and work were completed by the Supervising Architect's Office during the year:

Quarantine wharf, disinfecting shed, oil house, attendants' quarters, and 824 feet of concrete walks, all of which add very materially to the station's efficiency.

Prior to the building of the quarters for the attendants, they were quartered in the cabin passenger building.

There has been built during the year by the station force a landing for small boats, a ways for taking out the launch and other small boats, 148 feet of concrete walk from attendants' quarters to the beach, 140 feet of walk leading to steerage passenger building, and a wharf 209 feet long and 5 feet wide, at the bayou. The approach to this wharf is 450 feet long and 2 feet wide, and the walk leading to approach from steerage passenger building is 746 feet long and 2 feet wide. Wharf and approach are creosoted piling salvaged from the old quarantine wharf and the walk was mostly laid on creosoted pieces saved from the construction of the new quarantine wharf.

The entire construction (except the stringers and most of the planking of the wharf proper) was made from material salvaged from the old quarantine wharf and creosoted pieces left after construction of the new wharf.

The first intention was to repair the wharf already there, but when the work was commenced it was found to be impracticable.

The wharf approach and walk total a length of 1,405 feet.

Repairs were made to the steerage passenger building and to the screening of all the other buildings.

Other repairs and work of minor importance have been done during the year.

Comparing the transactions at the station during the past year with that of previous years it will be seen that the volume of business has exceeded by far that of any previous year. The work has gone along smoothly without a failure at any time on the part of the owners or masters of vessels to cooperate with the medical officer in charge in carrying out the quarantine regulations. It has been noticed also that the sanitary condition of vessels upon arrival at quarantine has improved generally over that of previous years.

Savannah (Ga.) quarantine.—Acting Asst. Surg. William J. Linley in charge.

Two hundred and thirty-one vessels, carrying 6,688 seamen and 2,234 passengers, arrived; 121 were inspected and passed; 24 boarded and passed; 61 inspected, fumigated, and released; and 4 held from one hour to three days pending diagnoses. Twenty-one passenger ships, arriving from New York, during the poliomyelitis epidemic, were boarded, and the temperatures of all persons under 17 years of age taken.

The masters of 111 vessels were instructed in writing that all precautions should be taken to prevent the escape of rats from their ships while lying at the wharves in Savannah.

Three hundred and forty-six dead rats were collected after fumigations and burned in ships' furnaces.

South Bend (Wash.) quarantine.—Acting Asst. Surg. George A. Tripp in charge. During the year eight sailing vessels were inspected and passed. These vessels carried a total of 75 passengers and crew.

Tocoma, Wash.—Acting Asst. Surg. F. J. Schug in charge.

Forty ships were fumigated by sulphur for the destruction of rats, the vessels having been passed at Port Townsend quarantine with provisional pratique, subject to fumigation at the port of destination (Tacoma).

Table giving foreign, oriental, and insular stations and transactions for fiscal year ended June 30, 1917.

Station.	Total number of vessels inspected.	Number of vessels fumigated.	Total number of passengers and crews inspected.
Aguadilla, P. R	10	.....	103
Arecibo, P. R	1	.....	36
Arroyo, P. R	2	.....	10
Callao, Peru	174	144	24,257
Cavite, P. R	18	.....	1,509
Cebu, P. I	123	100	7,932
Fajardo, P. R	80	.....	690
Guanica, P. R	173	.....	9,088
Guayaquil, Ecuador	92	76	7,848
Habana, Cuba	1,648	519	148,413
Hilo, Hawaii	50	65	7,039
Hongkong, China	331	60	53,142
Honolulu, Hawaii	566	158	98,873
Humacao, P. R	18	.....	143
Iloilo, P. I	56	247	3,507
Jobos (Aguirre), P. R	3	.....	16
Jolo, P. I	35	.....	3,108
Kahului, Hawaii	16	1	40
Koloa, Hawaii	1	.....	10
Lahaina, Hawaii	4	.....	164
La Guaira, Venezuela	119	2	12,096
Makaweli, Hawaii	12	.....	164
Mahukona, Hawaii	3	.....	37
Manila, P. I	580	171	84,638
Mayaguez, P. R	93	1	4,281
Naples, Italy	192	.....	36,621
Olongapo, P. I	9	.....	904
Palermo, Italy	28	.....	4,104
Ponce, P. R	94	1	10,357
Progreso, Mexico	48	34	.....
San Juan, P. R	508	40	55,545
Shanghai, China	179	32	43,538
Tampico, Mexico	318	189	.....
Tuxpam, Mexico	176	53	7,760
Vera Cruz, Mexico	21	4	4,512
Zamboanga, P. I	16	.....	2,744
Amoy, China	37	.....	5,848
Total	5,834	1,897	639,077

Foreign Quarantine.

AMOY, CHINA.

Acting Asst. Surg. J. H. Snoke reports as follows: The assignment of an officer of the United States Public Health Service to duty in the American consulate at Amoy is for the purpose of a more effective control of quarantine measures against vessels proceeding from this port, principally to ports in the Philippine Islands, carrying large numbers of Chinese passengers. The unclean character of the port of Amoy requires great care to prevent the introduction of quarantinable disease into the islands.

The duties of the service officer include inspection of ships, crews, passengers, and baggage.

While the shortage of tonnage due to withdrawal of ships for war purposes has resulted in fewer sailings for the Philippines from this port, the number of passengers carried by each ship has in most cases been considerably increased, with resulting difficulty in handling the work.

All steerage passengers and the crew of the ship are requird to be inspected and bathed immediately prior to sailing. First-cabin

passengers are inspected; those afflicted with quarantinable diseases are rejected, and those whose sanitary condition is unsatisfactory are given the option of being bathed or leaving the ship. Attempts have sometimes been made by laborers to avoid the bathing process by taking first-cabin tickets, and the rule above indicated has necessarily been put in force to check this practice.

The two navigation companies which have ships plying from this port to the Philippine Islands both maintain disinfection plants at Amoy, the one in a commodious godown, where accommodation is found for bathing 20 persons at a time, and sufficient room for inspection of passengers, with satisfactory equipment for disinfection of their effects by steam. The other plant is maintained on a floating hulk brought alongside the steamer. This plant accommodates 16 persons at a time, and with the increased number of passengers it has been difficult properly to control the disinfection in this floating hulk, which is not entirely satisfactory.

Considerable improvement has been noted during the year in the condition of the personal effects of passengers; the steamship companies have, through the passenger brokers, warned passengers that their effects must be clean, clothing washed and ironed, etc., so that the quantity of personal effects subjected to disinfection by steam has been reduced.

The number of persons put off the ship on account of quarantinable or loathsome diseases continues at an average of one or two each trip.

During the year bills of health were issued to 37 vessels bound for the Philippine Islands. These ships carried 5,848 passengers.

Formerly the consulate did not seek the services of the United States Public Health officer in connection with bills of health for ships other than those carrying passengers to American ports. There is a line of Japanese steamers plying from Japan, via Formosa, Amoy, and Manila to Java, and these vessels while calling at Amoy do not take on at this port passengers or cargo for Manila. The present consul has, however, required the services of the United States Public Health officer in connection with the issuance of bills of health for these ships; personal inspection of the ships, crew, and passengers, as well as of cargo manifests, is now conducted by the quarantine officer in conjunction with the consul.

CLEAN CARGO BOATS, RAT GUARDS, ETC.

On November 16, 1916, at the instance of the chief quarantine officer of the Philippine Islands, the consulate issued the following circular concerning clean cargo boats, adding the advice concerning rat proofing of cargo:

Rat-free lighters and cargo boats.—Shippers, agents of vessels, and shipmasters are notified that hereafter extreme care must be taken in the loading of vessels bound for American ports, to use lighters and cargo boats free from rats or vermin. Lighters and cargo boats capable of being fumigated must be fumigated under the supervision of the United States Public Health officer attached to the consulate; other boats must be cleaned and made free from rats before taking cargo on board.

Rat-proofing packages.—Shipping agents were requested to caution all shippers of cargo to American ports that their shipments would be subject to inspection on board and all packages should so

far as possible be made rat proof. All foodstuffs should be in rat-proof packing; i. e., in tight cases, barrels, kegs, buckets, cans, or in closely woven baskets with tops of wood or screening wire or other screening.

Paragraph 39, Quarantine Regulations, provides:

> Articles which harbor or are liable to harbor rats or rat fleas should not be shipped until freed of such vermin, either by the use of chemicals, fumigation, or solutions, or by preventing the access of rats for 15 days before shipment.

This requirement is being enforced as carefully as possible considering the limited facilities of the consulate.

On April 4, 1917, following consultation with the Public Health officer and the bureau (through the Department of State), the following additional instruction concerning rat guards was issued, compliance therewith being made a condition precedent to the issuance of bills of health in all cases—whether the vessel merely calls at Manila or carries cargo or passengers for that port:

> Under paragraph 35 of the United States Quarantine Laws and Regulations the following requirement will be enforced on and after April 25, 1917, on all vessels sailing from the port of Amoy and calling at or entering American ports or ports of the Philippine Islands:
>
> "All cargo boats and lighter lines and lines leading to the vessel from any other vessel or craft laying alongside must be equipped with inverted cones or other approved rat guards."
>
> This regulation is additional to the requirement for clean and rat-free cargo boats and to the advice concerning rat proofing of cargo.
>
> This regulation is applicable whether or not the vessel takes on cargo or passengers at this port for American ports or ports of the Philippine Islands.
>
> Under paragraph 5 of the United States Quarantine Laws and Regulations compliance with the foregoing requirement is made a condition precedent to the granting of an original or supplemental bill of health.

Through the use of marine glasses the consulate holds the ship constantly under inspection, and slackness in the use of rat guards is promptly checked.

It is believed that these two measures have been effectively enforced, and that they have had beneficial results.

FUMIGATION.

On account of the lack of sulphur supplies or other fumigation materials at the port, no fumigations have been carried out during the year. Vessels on the regular run are fumigated at Manila. Others are required in each case to produce the certificate of last fumigation of the vessel.

EXAMINATION OF CARGO MANIFESTS AND CARGO.

All cargo manifests are carefully examined and signed by the quarantine officer. Narcissus bulbs shipped to the United States are the principal class of cargo inspected; these are examined by the quarantine officer to determine that they are free from mud, dry, and not likely to carry infection.

WEEKLY SANITARY REPORTS.

An effort has been made by the quarantine officer and the consul to improve the information given in these reports. In the absence of satisfactory statistics from the port and municipal authorities, the

information given is general, but the quarantine officer in his private practice and in his relations with members of the medical profession and others is able to furnish general information calculated to indicate the general state of the health of the port.

Copies of the weekly sanitary reports are sent through the consulate to the medical officers at Shanghai, Hongkong, and Manila, in addition to those sent to Washington.

CATTLE DISEASES.

The quarantine officer, through correspondents in the interior and personal observation, seeks to assist the consulate with information concerning cattle diseases under the joint regulations of the Treasury Department and Department of Agriculture.

HEALTH CONDITIONS OF THE PORT.

Health conditions of the port for the fiscal year have been exceptionally good, due no doubt to the very dry fall and winter of 1916 and the cool spring and summer of 1917. Plague exists, but not in epidemic form. There has been no cholera.

CALLAO, PERU.

Acting Asst. Surg. J. L. Castro-Gutierrez reports as follows:

During the fiscal year ended June 30, 1917, 174 vessels destined for ports in the United States, its possessions or dependencies, were inspected, of which number 144 were fumigated prior to departure. This procedure included the inspection of 14,025 members of crew, 6,358 cabin passengers, and 3,874 steerage passengers; 2,760 persons coming from localities infected with smallpox were vaccinated. The number of pieces of baggage disinfected was 2,622, and 330 pieces were inspected and passed. A large number of hides and animal products were certified as properly disinfected.

During the calendar year 1916 the number of plague cases throughout Peru increased, being 55 more than the preceding year. In Callao plague conditions continued practically the same as in former years, the 40 cases occurring during the calendar year 1916 being the greatest number reported since the inception of the epidemic in 1907. For the purpose of plague eradicative measures in Callao the Peruvian Government has appropriated a small amount of money and regulations have been prepared for the enforcement of antiplague measures. The number of cases of plague reported from the various departments of Peru throughout the calendar year 1916 was as follows:

Callao	40
Lambayeque	90
Libertad	129
Lima	85
Piura	78
Ancachs	62
Arequipa	24
Cajamarca	2
Total	510

Practically every seaport of Peru must be regarded as plague infected.

During the year there were a number of cases of smallpox.

With the increase in Japanese immigration and the lack of medical examination of aliens entering the country, there was a considerable increase in the number of cases of leprosy at Lima. A number of Japanese and Chinese lepers have been apprehended and deported, the assistance given by the Public Health Service in facilitating the passage of these lepers on vessels touching at American ports being very much appreciated by the Peruvian authorities. During the year two intending passengers on steamers destined for Panama were rejected on account of leprosy.

On account of the neglect of mosquito preventive measures, cases of malaria are increasing yearly at Callao. Typhoid fever also is increasing at Callao and Lima, and the prevention of these diseases receives very little attention from the sanitary authorities. The dissemination of the infection is largely due to the use of human excreta, street sweepings, and soil water from the sewage service as fertilizer for vegetables destined for consumption in Lima and Callao At Lima the municipal water supply is treated with chlorine. Another factor probably entering into the increase in typhoid is the lack of supervision of milk production, although there is some attempt being made in Lima and Callao to control the milk production.

The death rate in Callao was 29.67 per 1,000. Tuberculosis ranks first as the cause of death, practically one-fourth of all deaths being due to this disease.

GUANTANAMO BAY, CUBA.

Acting Asst. Surg. J. H. Iden reports as follows:

The health officer of this port boards all merchant shipping entering this bay destined to dock at the naval station, and as the naval station is not an open port the only vessels touching here are naval ships and ships of the Ward Line, which bring supplies from New York. During the year no quarantinable diseases were discovered on any of the vessels boarded.

GUAYAQUIL, EQUADOR.

Passed Asst. Surg. Herman B. Parker reports as follows:

Summary of transactions.

Bills of health issued	92
Vessels fumigated (sulphur)	76
Vessels inspected and passed	8
Vessels passed without inspection	8
Number of crew inspected	5,607
Number of cabin passengers inspected	1,421
Number of steerage passengers inspected	820
Number of cabin passengers for United States ports	615
Number of steerage passengers for United States ports	172
Baggage fumigated	3,728

Quarantinable diseases.—Cases of yellow fever, plague, and smallpox have occurred in sufficient numbers as to be a menace to the traveling public and shipping during the fiscal year.

Yellow fever.—This disease appeared in epidemic form throughout the year. The month of July was characterized by a small epidemic with a high mortality among the native infant population. The figures presented are probably very low on account of the difficulty in arriving at a correct diagnosis. In Guayaquil there were reported 9 cases as remaining from the previous year and during the year there occurred 216 cases with 109 recoveries and 116 deaths. In Milagro there were reported 14 cases with 7 deaths, in Babahoyo 6 cases with 2 deaths, in Duran 1 case with no deaths, in Chobo 2 cases with 1 death, and in Naranjal 2 cases with 2 deaths. Cases occurred in every month of the year.

Bubonic plague.—From the previous year there remained 4 cases under treatment. During the fiscal year there occurred 577 cases, of which 360 recovered and 220 died, one remaining under treatment. No cases were reported in the higher altitudes, but in the country surrounding Guayaquil the following localities reported cases: Santa Rosa, 2 cases, 1 death; Duran, 3 cases, no deaths; Nobol, 3 cases, with 3 deaths; Milagro, 5 cases, with 1 death; Naranjito, 1 case, no deaths; Tauro, 4 cases, 2 deaths; Salitre, 1 case, 1 death; and Estancia Viejo, 1 case, with no deaths.

No effective sanitary measures to combat this disease are in progress.

Smallpox.—After an absence of about 10 years, smallpox appeared again in the city of Guayaquil, and notwithstanding the clearly defined methods of combating the infection it still continues a menace to the public health. There were 75 cases, with 9 deaths.

Typhoid fever.—This disease may be considered as endemic throughout the Republic. While much has been written on this disease in tropical countries it presents the same general characteristics as in temperate climates, with the same mortality and complications as the disease in temperate climates.

Sanitation of Guayaquil.—Owing to the war conditions the projected public improvements have been greatly curtailed. The water distribution system of the city was completed last year. The reservoir is nearing completion and the source, the Daule River, has been determined upon. It is worthy of note that obtaining Daule River water presents difficulties which in this country are insurmountable, entailing an upkeep that will be in excess of the revenues. The logical water supply is the mountain streams which are accessible.

In the minor diseases the dysenteries, both amœbic and bacillary, tuberculosis, measles, chicken pox, malaria, and intestinal worms still prevail.

Poliomyelitis.—This disease was first reported in 1912. Since that time sporadic cases have come under observation. One locality, Santa Rosa, seems to be the center of the infection at the present time.

Yellow fever and bubonic plague in Guayaquil, Ecuador, during the fiscal year ended June 30, 1917.

	Previously reported.	New cases.	Recovered.	Died.	Remaining
Yellow fever		216	109	116	0
Plague	4	577	360	220	1

HABANA, CUBA.

Acting Asst. Surg. Richard Wilson, in charge, reports as follows:

The nature of the transactions at this station in the latter half of the fiscal year varied somewhat from those in the first part of the year. During the second half of the fiscal year there was a material diminution in the inspection of certain classes of cargo, and the period of fumigation of ships was lengthened, this being due to the subsidence of plague infection in Habana.

The duties of the medical officer, in brief, are the inspection of vessels, cargo, and personnel, the issuance of bills of health, in conjunction with the consul general, to all vessels destined for the United States, either direct or by way ports; the fumigation of vessels for the destruction of rats when such vessels are destined to the United States or ports in its possessions and dependencies. The service officer on duty at Habana likewise gives medical aid to American seamen in all cases not necessitating hospital treatment. The service continues to have its office in the Machina Building, quarters being furnished as a courtesy by the Cuban Government. If it were practicable to have additional rooms additional aid could be given to sick American seamen. The present lack of space makes it necessary to send minor surgical cases to a private physician at the expense of the vessel.

The transactions of this office have been on a steady increase during the past five years, and give evidence of continuing to increase. The monthly average number of bills of health issued to vessels was 179, in comparison to last year's average of 152. All told, 2,144 bills of health were issued to vessels bound for the United States, its dependencies, or possessions.

The fumigation of vessels performed at Habana is divided into two classes: (1) Vessels fumigated by the service employees; (2) vessels fumigated by the Cuban authorities under supervision of the service inspector. The second class includes those vessels destined for the United States by way of other Cuban ports, the fumigation being performed by the Cuban health authorities and certified to by the service representative, a secondary fumigation being thus avoided.

The examination of outbound crated fruit for the purpose of excluding rodent infestation was discontinued in the early part of the fiscal year on account of the improvement in the report of plague infection. For the same reason the inspection of railroad cars destined for transshipment to Key West by ferry was likewise discontinued.

In compliance with bureau instructions, restrictions against transit passengers from Mexico were discontinued. These restrictions have been enforced in other years, but the procedure has been impracticable as it virtually depends on the cooperation of the ticket agents of the transportation companies, and can be nullified by the dishonesty of the passenger concerned.

During the fiscal year no bubonic plague has been reported either in man or in rodents, but the Cuban sanitary department has continued the work of plague prevention throughout the year. The total number of rats caught was 32,842, of which number 18,154 were examined.

During the year, as in previous ones, there was an increase in the typhoid rate in the summer months, presumably due to the mixing of the water from the Vento with that from the Almendares River, which is a polluted stream. Undoubtedly gastrointestinal diseases have increased also, but as they are not reportable the increase is not shown. From the tabulated statement of infectious diseases in Habana during the fiscal year 1917 it is seen that the greatest number of cases of any one disease are those of measles, of which there were 890 cases and 40 deaths. Malaria ranked next in number, with 540 cases and 13 deaths. This is a considerable increase over last year, when there were 98 cases with 5 deaths, the fatal cases all being reported as coming from the interior of Cuba. Conditions, however, have changed during the present year, the disease having taken a firm hold in the city. Fortunately, however, it is a benign type. Of typhoid fever there were 406 cases, including 80 deaths.

During the year the leprosarium, known as the Hospital San Lazaro, within the city of Habana, was abandoned, the old buildings being destroyed. A new leprosarium was constructed a short distance from the town of Rincon, located about 15 or 20 miles south of Habana. At the time of the removal of the lepers from San Lazaro to the new leprosarium at Rincon there were from 240 to 250 cases. During the fiscal year there were reported in Habana 10 cases of leprosy.

Tabulation of service transactions at Habana.

[Transactions of fiscal year 1917 compared with those of previous year.]

	1915-16	1916-17
Vessels inspected	1,040	1,648
Vessels not inspected (via foreign ports)	787	496
Total bills of health issued	1,827	2,144
Number of crew inspected	60,806	90,382
Total passengers inspected	37,313	58,031
Vessels fumigated by the service force	424	519
Vessels fumigated by Cuban authorities, under supervision of the service force	248	243
Vessels recommended for fumigation at a United States port	122	74

Principal infectious diseases reported in Habana and Regla during the fiscal year 1916–17.

	Cases.	Deaths.
Typhoid fever	406	80
Paratyphoid fever	28	3
Typhus exanthematous	1	.....
Malaria	543	13
Diphtheria	201	25
Scarlet fever	81	3
Measles	890	40
Chicken pox	72	.....
Smallpox	2	.....
Infantile tetanus	.....	.....
Cerebrospinal meningitis	1	1
Leprosy	21	6
Rabies	1	1
Poliomyelitis	5	.....

OPERATIONS OF THE SERVICE IN HAWAII.

The activities of the United States Public Health Service in the Hawaiian Islands, under direction of the chief quarantine officer,

remained the same as for the previous year and were divided as follows:

(1) National quarantine; (2) marine-hospital relief; (3) medical examination of aliens; (4) plague laboratory.

GENERAL.

Service officers are stationed at the seven ports of entry in the Hawaiian Islands, namely, Honolulu, Hilo, Kahului, Lahaina, Mahukona, Makaweli, and Koloa.

At the ports of Hilo and Kahului there is sufficient equipment for the fumigation of vessels for rodent and mosquito eradication, while the remaining four ports are simply inspection stations, and there is no equipment for the fumigation of vessels.

On account of the dismantling and removal of quarantine wharf, the service at this port was deprived of the use of the disinfecting machinery, and any fumigation required of arriving vessels can only be accomplished by the pot and pan method.

Certain of the quarantinable diseases prevailed to a considerable extent at the foreign ports of departure of vessels bound for the Hawaiian Islands during the year.

Cholera was present throughout the year at the Dutch East Indian ports, was present to a considerable extent in Manila, and occurred in epidemic proportions, in fall of 1916, in Japan.

Plague was present in Hongkong, the Dutch East Indies, and the west coast of South America; smallpox was reported from the Chinese ports, Dutch East Indies, Russian Pacific ports, and toward the close of the year there was a sharp outbreak of the disease in Japanese ports.

Typhus was reported at Vladivostok and the Dutch East Indian ports.

During the year 3 vessels arrived with cases of leprosy on board, while 8 vessels arrived with smallpox on board or histories of having had the disease on board during the voyage.

Vessels inspected.—Six hundred and fifty-two vessels were boarded and inspected upon arrival at the following ports of entry, namely, Honolulu 566, Hilo 50, Kahului 16, Mahukona 3, Makaweli 12, Lahaina 4, Koloa 1.

Canal Zone bills of health.—Eleven were issued at Honolulu to vessels bound for the Panama Canal.

A short tabulation of the transactions for the year is as follows:

	Honolulu.	Hilo.	Kahului.	Mahukona.	Makaweli.	Koloa.	Lahaina.	Total.
Vessels inspected	520	50	16	3	12	1	4	594
Vessels disinfected and fumigated	158	65	1					324
Bills of health issued	556	114	77	12	39	1	5	804
Crews inspected	32,502	3,196	40	37	164	10	164	56,113
Passengers inspected	66,371	3,843						70,214

The question of abolishing the quarantine inspection upon arrival at Hawaiian ports of vessels from Pacific mainland ports and solely engaged in the coastwise trade was agitated and thoroughly considered in the fall of 1916. It was decided to continue the inspection of vessels from Pacific coast ports upon arrival at ports in the islands.

INCREASE IN TRANS-PACIFIC SHIPPING.

The number of trans-Pacific liners was largely increased by the addition of seven large passenger and cargo steamers of Nederland Royal Mail & Rotterdam Lloyd Steamship Cos.

These vessels formerly plied between Holland and the Dutch East Indies by way of the Suez Canal, but on account of the submarine peril they were diverted and are now on a regular schedule between the East Indies and San Francisco, touching en route at ports in China, Japan, and Honolulu.

The Pacific Mail Steamship Co. which withdrew its vessels from the oriental trade in 1915, reinaugurated the service in the fall of 1916, by placing three vessels, purchased from Dutch owners, of 3,517 tons in operation.

This increase in shipping has added materially to the work of this station, for these vessels all carry a large amount of freight, as well as numerous passengers and they all touch at infected ports in the Orient and East Indies.

CHOLERA.

The presence of cholera in Japan was first reported by the Associated Press on August 5, 1916, an outbreak of the disease having occurred on the Osaka Shosen Kaisha steamer *Hawaii Maru* at Yokohama on July 30, 1916, just prior to departure of the vessel for Puget Sound.

On August 19, the Nippon Jiii, a local Japanese paper, received a cablegram from Tokio to the effect that the disease was spreading in an alarming manner, and that numerous cases were being reported daily in the three large cities of Yokohama, Nagasaki, and Osaka.

The first vessel to arrive from Japan, was the freight steamer *Shinyo Maru No. 2*, on August 22, 1916, which had sailed from Kobe August 2, and Yokohama August 5. The bills of health from both ports were clean, as regards cholera, and further, no mention was made on the Yokohama bill of health of the outbreak of cholera on the *Hawaii Maru.*

This vessel was allowed to discharge her cargo and transact business in quarantine and departed for San Francisco on August 24. In view of these facts and in accordance with the requirements as contained in Department circular letter of July 19, 1911, No. 47, a quarantine of all vessels arriving from Japanese ports and their personnel was instituted. Saloon officers and cabin passengers were allowed ashore, the through steerage passengers and crew were detained on board, while the steerage passengers for the islands and stowaways were removed to the station and there examined for cholera vibrios in the stools.

This quarantine was continued until December 16, 1916, when, in view of the practical disappearance of the disease at Japanese ports, all restrictions were removed.

QUARANTINABLE DISEASES ON ARRIVING VESSELS.

Smallpox.—The Steamship *Shinyo Maru* arrived from Yokohama on November 2, 1916, with a steerage passenger seriously ill of con-

fluent smallpox of about nine days' duration. The case and nurse were removed to the station, and as the ship's surgeon had only discovered the case five days before arrival, it was deemed necessary to remove all the steerage and second-class passengers to quarantine, and to disinfect the steerage and hospital compartments on board.

On January 8, 1917, the steamship *Tenyo Maru* arrived from Yokohama with a case of confluent smallpox in the person of a cabin passenger. In view of the excellent sanitary measures taken by the surgeon of this vessel, it was only necessary to remove the patient, and two contacts to the station, and after disinfecting the hospital, to grant the vessel pratique.

The case of the last-named patient was of interest in that she was 66 years of age; she had never been vaccinated since childhood; and she had been ashore but at very few of the ports touched at on the round trip.

The steamship *Ecuador* arrived January 23, 1917, with a cabin passenger, Chinese infant of 4 months, ill with confluent smallpox.

Here again it was only necessary to remove the patient and contacts and to disinfect the hospital before granting the vessel pratique.

The case from the *Shinyo Maru* ended fatally, while the cases from the *Tenyo Maru* and *Ecuador* both recovered.

Five other vessels arrived during the year with histories of having had cases of smallpox removed at ports touched at en route, and as the necessary precautions had all been taken it was not necessary to carry out any measures on arrival.

Leprosy.—Three vessels arrived with leprosy on board, and two with histories of having landed cases of the disease at ports touched at en route.

Those with leprosy on board consisted of the transport *Dix* from Seattle with two cases being returned to Manila; the steamship *Kiyo Maru* with five cases from Callao en route to Hongkong, and the steamship *Great Northern* from San Francisco with a case of the disease in the person of a cabin passenger. This last named was turned over to the board of health, he being a resident of the Territory, and in all cases the requirements of the regulations were complied with.

Cholera.—The steamship *Anyo Maru* arrived from Japanese ports on October 20, 1916, with the history of having landed a case of cholera at the Kobe quanantine station on September 27, 1916.

As the vessel had been quarantined at Yokohama, and all the crew and passengers examined for carriers, it was not deemed necessary to carry out any further precautions.

CONTAGIOUS DISEASES ON ARRIVING VESSELS.

Forty-seven vessels arrived during the year with contagious diseases on board, of which there were 91 cases of measles, 15 mumps, 3 diphtheria, 4 epidemic cerebrospinal meningitis, 9 scarlet fever, 1 typhoid, 22 varicella, 1 tuberculosis, and 1 of pertussis.

Of this number, there occurred among the personnel of transports, principally recruits, 52 cases of measles, 7 mumps, 1 diphtheria, 3 epidemic cerebrospinal meningitis, 9 scarlet fever, and 1 of pertussis.

These cases on the transports were all removed and isolated at the department hospital, Fort Shafter, while those occurring on other vessels were all reported to the board of health and passengers detained on board until the cases had been seen and action taken by a representative of the board of health.

PANAMA CANAL.

During the year 65 vessels arrived from the canal, while 9 departed for ports on the east coast of the United States.

WHARF.

As stated in my previous report the sum of $22,000, appropriated by Congress for the removal and reconstruction of the quarantine wharf proved insufficient, all the bids received being in excess of this amount, and it was accordingly necessary to obtain an additional $10,000 in order to undertake the work.

The bid of the Lord-Young Engineering Co. (Ltd.) for $29,674 for the removal and reerection of the wharf was accepted by the department, the old wharf to be torn down by November 1, 1916, and reconstruction on the new site to be completed by March 1, 1917.

The proposal of the Standard American Dredging Co. for dredging and removing 311,000 cubic yards of material, principally hard coral, at the rate of 23.9 cents a yard was accepted by the War Department, work to be started on October 7, 1916, and to be completed in 18 months.

There was a wide difference shown in the bids made for dredging the 311,000 yards of material which were as follows: Standard American Dredging Co., 23.9 cents a yard; Hawaiian Dredging Co., 53 cents a yard; Lord-Young Engineering Co. (Ltd.), 63 cents a yard.

In accordance with the specifications, the Lord-Young Engineering Co. (Ltd.) immediately started work and the wharf was dismantled and all material removed by November 1, but the Standard American Co. failed to comply with the terms of their contract to begin work on October 7, and at the close of the fiscal year, they have no equipment on hand and not a foot of dredged material has been removed.

It is understood that this company has agreed to begin work on August 15, 1917, but that is probably largely problematical, and it will certainly be a year or more before the wharf can be rebuilt.

This unlooked for and totally unnecessary delay has worked a great hardship in the conduct and operation of the quarantine at this port. Launches and floating equipment could not be properly taken care of, while infected vessels have had to be treated at their regular docks in the port and the infected personnel transferred through the city by auto trucks to the quarantine station.

On account of the dismantling and removal of the wharf to permit of dredging and the consequent loss of the launch landings and boat davits on the wharf, it was necessary to build a small temporary boat landing in front of the fill on the Makai side of the harbor and to connect this land with the runway by a small trestle foot bridge, the required work being done by the station force.

DISINFECTING MACHINERY ON WHARF.

This machinery, consisting of boilers, steam chambers, sulphur furnaces, fans, piping, and pumps, was thoroughly overhauled, repaired, and painted throughout in the early part of the year and when the wharf was dismantled, was in excellent condition.

Considerable damage was done to this machinery by falling roof trusses and carelessness in handling when the machinery was removed from the wharf and placed on adjacent land for temporary storage. Furthermore, the contractor was very tardy in erecting a covering over this machinery, and the latter was exposed to several very heavy rainstorms before any protection was obtained. There is thus bound to be more or less deterioration of this equipment and, in addition, that which is due to the length of time this machinery will lie without care or attention until the dredging is accomplished and the wharf rebuilt.

VESSELS FUMIGATED FOR RAT DESTRUCTION.

The work of keeping the interisland vessels free of rodents and insects that might be capable of transmitting disease has been continued throughout the year. All vessels engaged in the interisland trade have been regularly fumigated, during the early part of the year those touching ports on the island of Hawaii, where plague prevails, being fumigated every 30 days, while those touching at other ports were treated every 3 months. Toward the latter end of the year, in view of the rat free condition of the vessels and the absence of any reported plague on Hawaii, the period between fumigations of vessels touching this island was extended to 60 days, but on account of the reappearance of plague on Hawaii at the close of the year the period was again reduced to 30 days.

All rodents obtained from fumigated vessels were sent to the plague laboratory for examination for plague infection. No plague infected rodents on vessels were found during the year.

The vessels fumigated for the purpose of rat eradication were classified as follows:

1. Vessels from foreign ports.
2. Vessels bound for United States ports.
3. Vessels engaged in interisland trade.

1. *Vessels from foreign ports.*—Eleven vessels were fumigated during the year, with a resulting yield of 31 rats.

2. *Vessels bound for United States ports.*—Fifty-one vessels, mostly sailing vessels engaged in carrying lumber from mainland ports, were fumigated during the year, with a resulting rat yield of 174 rats.

3. *Vessels engaged in the interisland trade.*—These vessels were fumigated at regular intervals in order to keep them rat free and thus lessen the transmission of plague by these vessels, as well as to keep them as clean as possible of vermin and insects, for the benefit of the traveling public. A total of 22 vessels are engaged in this trade, of which 14 were fumigated at Honolulu and 8 at Hilo, with a yield of 158 rodents.

The regular transpacific liners and Government vessels, principally transports, which touch at this port, a total of 26 vessels, were

either fumigated at Hongkong or San Francisco, 1,573 rats being obtained, while 252 were trapped by the crew of the vessels during the year.

The past year has shown a gratifying decrease in the number of rodents obtained by fumigation, as well as by the trapping by crews on the transpacific liners, but there is hardly a rat-free vessel, and the endeavor to keep these vessels as free as possible seems very hard of accomplishment. Fumigation every trip at San Francisco merely keeps the number reduced, but never completely frees the vessel.

The local liners, nine in number, plying between the islands and Pacific coast ports were either fumigated at Seattle or San Francisco during the year, with a resulting rat yield of 649.

Trapping of rodents on vessels by crews.—The trapping of rats by the crews of the vessels of the Toyo Kisen Kaisha Steamship Co. continued during the year to yield a large number of rats. This company pays a sen each for all rats trapped, the men being required to turn their catch over to the freight clerk so that an accurate record of the number caught on each vessel can always be obtained.

The number of rodents obtained by fumigation as well as those trapped during the year is shown by the following named two vessels:

Name of vessel.	Times fumigated.	Rodents obtained.	Rodents trapped.	Total.
Nippon Maru	5	148	197	345
Seiyo Maru	7	61	40	101

FUMIGATION OF VESSELS FOR MOSQUITOES.

The fumigation, for the destruction of mosquitoes, of vessels from ports on the west coast of Mexico, Central and South America, was continued during the year. A total of 35 vessels being so treated, the majority being tramp vessels with cargoes of niter, either for the islands or destined for Vladivostock.

RAT-GUARD INSPECTION.

The rat-guard precautions to be taken by vessels while in port, as specified by department circular letter of June 10, 1912, were strictly enforced during the year, a daily inspection being made of all vessels in port in order to note the manner in which the requirements were being carried out.

CREMATIONS.

The remains of seven persons were cremated at the quarantine station during the year, of which four were cremated on account of leprosy, on request of the board of health; one was a steerage passenger who died from confluent smallpox in quarantine; one was a steerage passenger who died at sea from heart disease, and one a German seaman whose death was due to embolism while interned at the United States immigration station.

AID RENDERED OTHER GOVERNMENT SERVICES.

Board of health.—The remains of four persons, dying from leprosy at the Kalihi receiving station, were cremated at the quarantine station on request of the board of health.

One suspected cholera carrier, one diphtheria carrier, nine cases of varicella, one scarlet fever case and contact, and one case of measles were received and isolated at the station on request of the board of health.

A large number of swabs were prepared and sterilized and considerable amount of media were made for the board of health during the year.

Post office.—The local post office was furnished disinfectants during the year for the purpose of treating the mails from the leper settlement at Molokai.

Foreign consuls.—Sixteen seamen were admitted to hospital and 1 was furnished out-patient treatment upon the request of their respective consuls, while 21 seamen were examined upon request of masters of foreign vessels for rating as able seamen.

Lighthouse Establishment.—One employee was admitted to hospital and one was furnished out-patient treatment upon the request of the inspector of the nineteenth district.

PLAGUE ON HAWAII.

During the year plague was present only on the island of Hawaii, where it has existed for the past 17 years, and remained localized to the Hamakua district.

Three cases of human plague occurred, the first case being that of a Japanese stableman at the Paauilo stables on March 7, 1917; the second being that of a Portuguese stableman at the Paauhau mill camp on June 20, 1917; and the third a Japanese rat catcher at the Paauhau mill camp on June 23, 1917. All cases terminated fatally.

Four plague-infected rats were found, one being obtained on November 7, 8, and 9, respectively, at the Amana stables of the Hamakua Mill Co., and one from the Paauhau mill camp stables on June 8, 1917.

The last previous case of human plague occurred at Honokaa village on December 16, 1915, while the last previous plague-infected rat was found at Paauhau on January 16, 1916.

The plague work on Hawaii, under the able direction of Chief Sanitary Inspector D. S. Bowman, of the Territorial board of health, has been devoted largely to building the rat out of stables, warehouses, and habitations, and has been combined with an effective campaign of poisoning and trapping, so as to render habitations, stables, etc., as rat free as possible, but the task is one of immense proportions, for the rodents can obtain abundant nourishment in the cane fields, and owing to the ready shelter to be found in the gulches, stone walls, and fissures in the lava rock, it is well-nigh impossible to attempt anything but to keep the habitations and buildings as rat free as possible.

RAT CAMPAIGN.

Seventeen thousand five hundred and thirty rats and mongoose were taken in the district of Honolulu during the year; 17,155 were

trapped, 259 were killed in the fumigation of vessels, 4 were found dead, while 112 mongoose were taken.

This was a decrease of 797, as compared with the number obtained during the previous year.

PERSONNEL.

The following officers were on duty in the Hawaiian Islands at the close of the year:

Honolulu.—F. E. Trotter, surgeon, chief quarantine officer; L. E. Hooper, assistant surgeon; A. N. Sinclair, acting assistant surgeon; W. F. James, acting assistant surgeon; G. I. Van Ness, pharmacist; Frank J. Loncke, pilot and engineer; and E. F. Smith, medical inspectress.

Hilo, Hawaii.—L. L. Sexton, acting assistant surgeon.

Kahului, Maui.—William Osmers, acting assistant surgeon.

Mahukona, Hawaii.—B. D. Bond, acting assistant surgeon.

Koloa, Kauai.—A. H. Waterhouse, acting assistant surgeon.

MARINE HOSPITAL.

Transactions under this head are included in the report of the Division of Marine Hospitals and Relief.

Quarantine transactions at Honolulu, Hawaii.

Vessels inspected and passed	458
Vessels boarded and passed	32
Vessels inspected and fumigated for mosquitoes	35
Vessels inspected and fumigated for rat quarantine	11
Vessels inspected and detained in quarantine	30
Total vessels arriving	566
Vessels fumigated by request	3
Vessels fumigated	100
Vessels disinfected	9
Vessels arriving with quarantinable disease, or having had same on board during the voyage	13
Number of passengers inspected and passed	66,371
Number of passengers detained on account of quarantinable disease	478
Number of passengers detained and examined for cholera carriers	1,750
Number of crew inspected and passed	52,502
Number of crew detained on account of quarantinable disease	2
Number of crew detained and examined for cholera carriers	20
Number of Filipinos found to be cholera carriers on examination at Manila prior to embarkation	21
Number of rodents killed on vessels by fumigation	253
Classification of rodents killed on vessels by fumigation:	
Mus alexandrinus	81
Mus rattus	138
Mus norvegicus	2
Mus musculus	1
Unidentified	31

Quarantine transactions at subports.

	Hilo.	Kahului.	Mahukona.	Lahaina.	Makaweli.	Koloa.	Total.
Vessels inspected and passed	50	16	3	4	12	1	86
Vessels fumigated	65	1					66
Passengers inspected and passed	3,843						3,843
Crew inspected and passed	3,196	329	40	37	164	10	3,776
Rats obtained in fumigation	117						117

Clinical types of human plague on the island of Hawaii, from July, 1916, to June 30, 1917.

Year	Bubonic.	Pneumonic.	Septicæmic.	Total.
1916				
1917	2	1		3
Total	2	1		3

Cases of rodent plague on the island of Hawaii, from July 1, 1916, to June 30, 1917.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1916											3		3
1917						1							1
Total						1					3		4

Cases of human plague on the island of Hawaii, from July 1, 1916, to June 30, 1917.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1916													
1917			1			2							3
Total			1			2							3

Plague laboratory.

Total rats and mongoose taken	17,530
Rats trapped	17,155
Mongoose trapped	112
Rats found dead	4
Rats killed by sulphur dioxide	259
Number of rats shot from trees	0
Number examined macroscopically	3,606
Number examined microscopically	13,887
Showing pest infection	0
Classification of rats trapped:	
Mus alexandrinus	7,723
Mus rattus	836
Mus norvegicus	2,461
Mus musculus	6,135
Classification of rats found dead:	
Mus alexandrinus	3
Mus rattus	1
Mus norvegicus	0
Mus musculus	0

HONGKONG, CHINA.

Asst. Surg. Thomas F. Keating in charge reports as follows:

Bills of health were issued to 331 vessel, carrying 5,970 cabin passengers, 17,599 steerage, and 29,573 crew.

Sixty vessels were fumigated under supervision of the service, and 681 rats were found dead after fumigation.

During the year 271 vessels sailed for ports in the United States and the Philippine Islands without fumigation.

Lighters fumigated for the destruction of rats during the year, 685.

Rats found on lighters after fugimation, 1,177.

Pieces of cargo inspected for rat proofing during the year and passed, 182,764.

Pieces of cargo inspected for rat proofing during the year and rejected, 529.

Pieces of cargo inspected for rat proofing during the year and held for rat proofing, 529.

Pieces of cargo rat proofed, 529.

The colonial Government reports a total of 98,565 rats caught and 68 found to be plague infected.

Quarantine diseases: Number of cases and deaths during the year.

	Cases.	Deaths.
Smallpox	916	692
Plague	36	30
Cholera	9	9

LA GUAIRA, VENEZUELA.

Acting Asst. Surg. W. J. S. Stewart reports that during the calendar year there were no cases of quarantinable disease in the Republic, except the possibility of the existence of yellow fever in Maracaibo and the fag ends of an epidemic of variola in the same city and States adjoining the Lake of Maracaibo. The yellow-fever commission of the Rockefeller Institute is inclined not to believe in the endemicity of yellow fever in Maracaibo, but the disease continues to be declared present there from time to time by the resident practitioners.

In the most available and authentic reports it is stated that no case of yellow fever has occurred in the eastern portion of the country for eight years; that no case has occurred in the central portion for certainly over a year and a half, and the few cases there have been doubted by some, notably some of the Rockefeller commission which was in Venezuela in 1916.

The only locality which at present there seems to be any question about as regards endemicity of yellow fever is Maracaibo and the immediate locality. At the meeting of the Second Medical Congress of Venezuela held in Maracaibo, in January of this year, a letter from Dr. Juan Guiteras to Dr. Paez, of Ciudad Bolivar, dealing with what he called the question of "larval(?) endemicity" was read, and the existence or nonexistence of yellow fever as an endemic disease of Maracaibo was discussed. The general trend of medical opinion, both of physicians there and leading men in Caracas, both medical and others, seems to be that occasional cases of yellow fever occur there and in that vicinity. Deaths are hardly ever reported from this cause, the form of fever being more or less atypical and mild. This has always been the case. So much so that from long ago, the German firms in Venezuela made a practice of sending young employees just out from Germany, first to Maracaibo, in order to contract the mild form of yellow fever for which the place was noted. Sometimes one died, but it was exceptional. The sudden stoppage of arrival of foreigners (the majority of whom were German) by the

European war may have somewhat to do with the disappearance of yellow fever from Maracaibo, if it has disappeared. Still, as long as the Venezuelan medical profession assert its existence there the place must be discriminated against.

The existence of variola was more or less strenuously denied last year by the authorities of the western portion of the country and was only reported as sporadic by the American consul at Maracaibo, but reports were received in this office from Curacao and from Maracaibo showing that there was a considerable number of cases. In the annual report of the Oficina de Sanidad Nacional for 1916 the existence of variola (a small epidemic) is admitted.

Dysentery appeared in epidemic form in June in Guatire, a town no great distance to the eastward of La Guaira, and in the month of October in Cocuina in the territory of Delta Amacuro. There were 5,139 deaths from this cause during the year, the disease appearing widespread in all States and in the federal district. There was an augmentation in the number of cases of typhoid fever in Caracas, although this disease was also widely disseminated throughout the Republic, many cases of paratyphoid being undoubtedly confounded with the true disease. From this cause there were 2,149 deaths in Venezuela in 1916, and in the city of Caracas there were 45, which was 37 less than occurred from this cause in 1915.

One case of yellow fever was reported from Villa de Cura to the Oficina de Sanidad Nacional. Investigation proved the utter unlikelihood of its occurrence. The patient recovered and there were no secondary cases. The probability of the sudden appearance of one sporadic case followed by no others, and the one case reported having been a person who was a resident of the locality, is remote.

However, all causes of deaths in Venezuela pale before the figures for malarial affections. There were 10,452 fatalities attributed to malarial fevers. In one State alone, that of Carabobo, with a population of only 198,396, there were 1,484 deaths during the year caused by malaria. On the other hand, the capital city, Caracas, with a population of 135,780, if the whole federal district be included (Caracas, La Guaira, Maquitatia, and Macuto) and the haciendas in the country, had only 28 deaths from this cause. The great mortality from malarial fevers is in the country districts and in the southern pasture land and grazing country. The very strong preference, which is more or less characteristic of Latin persons, certainly of Latin-Americans, for residing in or close to a town or city rather than in the country deprives the rural dwellers of proper medical attendance and medicine. There are many districts in this country where a physician has never resided and probably never will. Two years ago the severe outbreak of malarial fevers near Maracay, an important city in the State of Aragua, showed the fact that within an hour's distance of that city and on the most important railway of the Republic there were thousands living without medical attendance when required, and without quinine. Physicians had to be sent from Caracas and other cities to stop the epidemic, and every ounce of quinine used came from localities other than where the illness occurred. As showing the difference where medical attendance and supplies were available, only a few miles away was a large military camp of some 3,000 men, but few of whom were ill from malarial

fevers, presumably due to medical attention and availability of medicine. In the last six years malarial affections have caused the enormous total of 48,878 deaths in Venezuela, a country whose entire population was estimated last December at 2,824,934.

Another most fruitful cause of death is infantile tetanus (mentioned in previous reports from this station). In 12 years, of a total of 683,932 deaths, 48,272 were due to tetanus. Of this number, in 8 years (before that time no differentiation of the infantile variety was made) 20,567 were infantile tetanus.

Summary of transactions.

Total number of crews inspected	10,863
Number of passengers in transit	3,188
Number of passengers for Colon	318
Number of passengers for New York	417
Number of passengers for Porto Rico	405
Number of pieces of luggage inspected, passed, and labeled (approximately)	950

OPERATIONS OF THE SERVICE IN THE PHILIPPINES.

Surg. J. D. Long, chief quarantine officer, reports as follows:

In the Philippine Islands the service activities embraced the following divisions: (1) Incoming or national quarantine; (2) outgoing or consular quarantine; (3) interisland quarantine, both incoming and outgoing; (4) medical inspection of immigrants; (5) sanitation of interisland vessels and ports; (6) physical examination of applicants for marine licenses and other Government positions; (7) miscellaneous duties not included in the foregoing.

The service in the Philippines carries out almost every function of the service in the States, except the care and treatment of seamen of the merchant marine embraced under marine hospitals and relief. The latter work is not performed in the Philippine Islands, because the American shipping laws are not applicable to the Philippines and in that connection the islands are administered as a foreign port with the insular collector of customs acting as American consul.

There are 10 medical officers of the United States Public Health Service in charge of the various activities in the Philippines, 4 of whom are commissioned officers and the remainder acting assistant surgeons appointed for duty at the several ports of entry. The service maintains quarantine or inspection stations at Manila, Iloilo, Cebu, Zamboanga, Jolo, Cavite, and Olongapo. Two quarantine detention and disinfection stations for the treatment of personnel and vessels in accordance with the quarantine regulations are maintained. The station for Manila and the northern part of the Philippine Archipelago is at Mariveles, on Mariveles Bay, 30 miles from Manila. For Cebu and the southern islands a station is maintained on the island of Cauit, in the harbor of Cebu, about 4 miles from the Cebu water front.

INCOMING QUARANTINE.

The incoming quarantine was conducted during the year in the same general manner and with the same measure of success as has obtained during the past decade. The islands are menaced from the outside to such an extent that the quarantine function is continually

a necessity. The responsibilities which rest upon the quarantine officers in preventing the introduction of diseases into the Philippine Islands from abroad will be partly comprehended when the sanitary conditions of the Orient are considered and it is realized that from the world's greatest centers of quarantinable diseases the Philippine Islands are but few days' travel by water, and that in many instances the period consumed by the voyage of the vessel is less than the incubation period of the disease. For these reasons the quarantine officers in the Philippines have a more difficult task to perform in carrying out the medical duties of the service in connection with arrivals from abroad than at many of the other quarantine stations of the world.

The sanitary conditions in the Orient are continually improving, and this improvement can largely be traced to the enforcement of the United States quarantine laws and regulations in the port cities. That all of the cargo bound for the Philippines and the United States must have been produced, transported, and loaded under certain prescribed sanitary conditions, imposed by the quarantine and other United States laws, has gradually brought about a sanitary working system which in some places has now become habitual, and as the oriental after once learning a method is loath to change it is hoped that these sanitary procedures may continue to improve the sanitation of the ports where cargo is loaded for our ports.

As the commerce of the Philippine Islands is constantly increasing, so in a greater proportion is the work of the quarantine service augmented, because in the gradual increase of commerce the number of small shipments increase in much greater proportion than the total amount of the increase indicates. Likewise increased commerce brings shipments from new localities, the sanitary conditions of which are not so well known, which also increases the work of the quarantine service and that of the consular officers abroad who cooperate with the local quarantine officers. In a country such as the Philippines, shipping is one of its principal factors, because all communication from outside the islands and between the different islands must be by water, consequently the potentialities of the quarantine function in the Philippine Islands can not be overestimated.

During the year under report the near-by foreign ports constituted the greatest menace to the Philippine Islands from a quarantine standpoint. The presence of quarantinable diseases in those ports, so near the Philippines, made them a source of constant anxiety. The following paragraphs will show that the Philippines were most seriously threatened from some one of those ports during every day of the year.

In Hongkong, which is less than three days' distance from the Philippines by vessels, cholera, smallpox, and plague were present in varying degrees of virulence throughout almost the entire year. Smallpox was present from June to November, 1916, in Hongkong but there were not more than 27 cases with 22 deaths per week. Later an epidemic of smallpox of a very serious nature occurred with as high a rate as 95 cases per week with the mortality of 66.

In Amoy plague was not severe in the city this year, but in the near-by provinces unofficial reports of as many as 50 deaths per day in

certain districts are received. Cholera and smallpox were also present in the city and vicinity. The large number of passengers arriving at Philippine ports from Amoy makes that port of considerable importance from a quarantine standpoint.

In Saigon and French Indo-China plague and cholera have been present but fortunately the epidemic lacked the severity which characterized them during some previous years.

In Borneo, the Straits Settlements, and the contiguous China coast a number of quarantinable diseases were present, and owing to their proximity to the southern islands of the Philippine group quarantinable diseases could easily gain admittance, owing to the short time required to make the voyage from the epidemic centers to a Philippine port. These near-by foci of infection constituted a continuous menace to the health of the Philippine Islands.

In Australia the outbreak of smallpox which occurred some years ago has continued, but is now under control and, owing to the distance from the Philippines, may be considered a negligible factor. It may be noted that the development along sanitary lines in Australia has progressed considerably during the past decade.

Shanghai and the ports in the coast north of Shanghai from which vessels arrive in the Philippines have remained during this year comparatively free from epidemics of quarantinable diseases; however, their presence in sporadic form requires measures to be taken almost as rigorous as if an epidemic were present, when greater precautions are taken as a matter of routine at the ports of departure.

In Japan an epidemic of cholera occurred which became very widespread and was of considerable interest from a sanitary viewpoint. On May 19, 1916, during the examination of arriving passengers at Manila, a passenger from Japan was found to be a cholera carrier; and on July 17, 1916, another cholera carrier was detected among the passengers arriving from Japan. This information was communicated to the Japanese authorities, but no cholera was officially reported until much later.

An interesting event from the quarantine standpoint occurred on board the steamship *Hawaii Maru*. A steerage passenger who boarded the vessel at Kobe was taken sick en route to Yokohama. The case was not diagnosed as cholera until two days after the death of the said passenger. Among the persons who were placed in quarantine from this vessel there occurred 40 cases of cholera and 4 carriers. The epidemic in Japan commenced about the 27th of July, and the disease spread rapidly until all but 7 of the prefectures had cases of the disease. The epidemic reached its height about the end of September. Up to December 2, 1916, the figures were 11,519 cases and 6,799 deaths in Japan. It was reported that 464 officials were employed in the endeavor to prevent the spread of the disease and that the cost to the Government was not less than $193,000. Plague was also reported in Japan in Yokkaichi and Nagoya, in each port named plague having occurred in both human beings and in rats.

In Macao cholera became epidemic in August, 1916, and the disease was also present in epidemic form for a considerable period in Canton.

DELAYS IN QUARANTINE PREVENTED.

This year as in recent years continual efforts were made to reduce or remove the necessity for detaining persons and vessels for longer or shorter periods in quarantine. The experience in the Orient during the past 16 years was used in imposing measures upon vessels and their personnel to safeguard to the highest possible point the Philippine Islands against the introduction of quarantinable diseases; and throughout the past year, even when surrounded by nearby foreign ports at which serious epidemics were at times prevailing, it was possible, by the strict observance of the regulations which were promulgated, to conduct the service activities without greatly interfering with the sailing of vessels and also without the detention of large numbers of persons at the various quarantine stations. Cases of quarantinable diseases were detected, and cases likely to develop into quarantinable diseases were isolated early and held under observation and the necessary precautions taken, many times without having to quarantine the vessel or its personnel. The results attained justified the procedure, and the eternal vigilance and large amount of energy put forth to conduct the year's quarantine work, so that not a single instance occurred where a quarantinable disease gained admission from outside the Philippines, is a cause of real satisfaction; and commendation is due those whose faithful labors made such results possible.

CHOLERA ON VESSELS.

During the small cholera outbreak which occurred in Manila in the latter part of 1916 cholera occurred on a number of vessels, but after the usual quarantine measures were put into effect there was no further spread from those foci of infection. Cholera occurred on a large number of vessels which arrived at Cebu and Iloilo, but after the usual measures were taken no spread occurred.

SMALLPOX.

Another year has passed without smallpox being introduced into the Philippine Islands from the outside, even in spite of the most severe epidemic which prevailed at nearby foreign ports. One case, which arrived on a vessel from Hongkong, was detected and held under observation and later resulted fatally. One case of smallpox arrived at Cebu on a foreign vessel and also one at Iloilo. The necessary precautions were taken and, while the cases resulted fatally, no secondary cases occurred. The crews of interisland vessels were kept vaccinated as heretofore. The crews of the Hongkong-Manila steamers were also vaccinated during the epidemic at Hongkong. All steerage passengers arriving from abroad were vaccinated before being allowed to disembark at Philippine ports. The number of vaccinations for the year was 8,690.

PLAGUE, TYPHUS, AND YELLOW FEVER.

No plague, typhus, or yellow fever were encountered on incoming vessels during the year under report. Yellow fever has not occurred as far as is known in the Philippine Islands. Cases of typhus fever

were reported at a number of isolated places, but there always has been a reasonable doubt as to whether all the cases were actually typhus fever. A few cases which were reported as having occurred in Manila and in Mindanao, if actually typhus fever, could probably be traced to persons who had recently lived in Japan, and who were probably carriers.

There has been no plague in the Philippines either in rats or in human beings since 1914. The near-by plague-infected centers with the exception of Amoy have had less plague during this year than for many years in the immediate past. The service in the Philippines, however, considers oriental ports as likely to be infected and has established precautionary measures in order to prevent its introduction through the medium of vessels and their cargoes.

OUTGOING AND CONSULAR QUARANTINE.

Vessels leaving the Philippine Islands for ports in the United States or its dependencies are subjected to the provisions of the United States quarantine laws and regulations which are in force at foreign ports. This work is termed consular quarantine and is performed in the Philippine Islands by the quarantine service in the same manner in which it is carried out at foreign ports by the officers of the American consulates. This work embraces inspection and fumigation of vessels; inspection of crews and passengers; bathing prospective passengers; disinfection, inspection, and certification of cargo and the general supervision of sanitary conditions which could in one way or another be instrumental in making it possible to convey quarantinable disease to American ports by means of vessels leaving the Philippines. A few of the statistics in this connection are shown in the following:

Bills of health issued	380
Crews inspected	24,276
Passengers inspected	11,742
Pieces of cargo inspected and certified	2,660,665
Vessels disinfected and fumigated	30
Vessels inspected	140

FIREPROOF LOW-PRICE HOUSE CONSTRUCTION SUITABLE FOR PHILIPPINE VILLAGES.

In view of the need in the Philippine Islands for some sort of fireproof building construction to replace the nipa, grass, palm leaf, bamboo, and similar light materials whose inflammability makes fire, when once started, so widespread and destructive in the villages and towns, the service in the Philippines has for some considerable time been experimenting, primarily for the general benefit of the Philippine Islands and secondarily to substitute such fireproof material for the various inflammable buildings at the several quarantine stations. During this year Mr. Robert Simonson, the superintendent of the Mariveles quarantine station, has by suggestion from and encouragement by the Manila office and the director of health, who greatly desired a suitable material for the construction of sanitary houses in connection with the work done by the sanitary commissions, at last perfected a covering shingle for use in the construction of roofs which has so far proven practical and serviceable. Further experiments along the same line enabled sidings for buildings to be

made of the same material. One house was constructed at Mariveles and is now in use by the municipality. Another, the materials for which were made at the Mariveles quarantine station, was exhibited at the Philippine carnival in February, 1917.

The materials out of which the structural forms and shingles are made are available, or can be procured, in almost any village of the Philippines, and it is believed that these experiments have perfected for use by the Filipino people of a building material which, on account of its economy, durability, and fireproofness, will be just what has long been needed for the construction of sanitary and fireproof houses for the barrios of the Philippines, which will end for all time, where this type of construction is adopted, the terrible general conflagrations which are so common in the Philippines and from which the local population suffers such severe financial losses. As soon as funds were available, a building of considerable size—a hospital of 120 beds—was constructed of this new material and is now being subjected to the tests which are necessary to prove beyond doubt its general adaptability for building purposes. So far the house at Mariveles has remained waterproof during the rains and winds, of considerable force, which have occurred since its erection. It has been subjected to rather severe tests by those interested in constructing buildings of the same material, and the tensile strength of the finished product has been tested and more than met the expectations as regards ability to resist fracture. It can be said that this accomplishment is one of the most promising achievements from an economic standpoint, especially as regards cheap housing, that has been developed in recent years.

FUMIGATION OF VESSELS AND RAT QUARANTINE.

In order to remove as completely as possible one means whereby plague might be transmitted from one portion of the islands to another from foreign vessels, or from the lighters engaged in their loading and discharging, all vessels in the interisland trade are fumigated periodically in order to destroy rats, fleas, and such insects as infest vessels. Ships from foreign ports were also required to be fumigated as often as deemed essential. Vessels on the Hongkong-Manila run were fumigated every other trip, and like treatment was given the vessels from other plague-infected ports. This work is carried out at all stations in the Philippines. During the year 96 vessels were fumigated at Cebu, 234 at Iloilo, and 150 at Manila. This work is at times termed "rat quarantine," the aim being to keep all vessels as rat free as possible. During the conduct of this work in the Philippine Islands there were recovered after the fumigation 1,810 rats, 523 mice, 108 other small animals and at least 1,863 liters of cockroaches, ants, etc. An accomplished report is required to be signed by the master of each vessel, reporting the number of animals killed by the fumigation. While this work had been conducted over a long period of years, no great diminution of the number of rats on board has been observed, of late years, though present figures show a large reduction when compared to results obtained when the work was first started some years ago, except on those vessels which accidentally escaped their periodical

fumigation when the number on board is usually quadrupled, showing that a vast amount of good is accomplished by this work, in saving to the vessels by lessening the destruction caused by rats, as well as the food necessary for their maintenance, and at the same time reducing to a minimum one means by which plague may be carried from port to port.

As a result of the continued fumigation of vessels there has been noticed a very positive increase in the efforts on the part of the ship's officers to keep their vessels free from rats. Recently one vessel which would fall in this class has been under observation and has now been fumigated at various intervals 18 times with a total of 14 rats for the 18 fumigations, and 13 fumigations without any rats being found after the fumigation. Controls, however, showed that the fumigation was efficient. The table of rats and other animals killed follows:

Animals killed.

	Manila.	Cebu.	Iloilo.
Number of rats	892	412	506
Number of mice	188	171	164
Number of liters of cockroaches	438	828	561
Number of liters of ants	16	10	10
Number of large centipeds	52	20	32

DISINFECTION OF VESSELS.

There were a large number of vessels disinfected at each of the stations in the Philippines during the year. The improved general sanitary conditions existing in the islands, together with the absence of the quarantinable diseases, naturally reduces the number of disinfections proportionately. Vessels were, however, disinfected on account of having cholera, smallpox, and leprosy aboard. All the vessels used in transporting lepers to the colony at Culion, were disinfected by this service, as heretofore.

EXAMINATION MADE FOR INTESTINAL PARASITES.

While conducting the laboratory examinations of arriving immigrants to determine whether they were afflicted with hookworm, examination was also made for cholera organisms, and intestinal parasites. There were 2,123 specimens examined in performing this work, of which number 333 were found to be positive for some kind of intestinal parasites and 1,165 were reported negative. In this examination 1 cholera carrier was detected. Among arriving alien steerage passengers the percentage of hookworm found is very low because all such passengers are examined and treated in the foreign ports of departure before the steamship companies will sell them tickets. The examinations showed that 32 specimens contained hookworm, 244 ascaris, 285 trichiuris, 72 double infection of ascaris and trichiuris, 5 trichiuris and hookworm, and 8 ascaris and hookworm.

PHYSICAL EXAMINATION OF APPLICANTS FOR MARINE LICENSES AND OTHER GOVERNMENT POSITIONS.

The service in the Philippines conducts the physical examinations of all applicants for licenses as masters, mates, and engineers of the vessels engaged in Philippine waters, and also for renewal of United States licenses. The applicants for admission to the Philippine Nautical School were also required to be examined by the officers of this service.

Examinations were made during the year as follows:

	Deck officers.	Engineer officers.	Total.
Manila	329	115	444
Iloilo	232	17	249
Cebu	40	13	53
Total	601	145	746

RATS IN CARGO.

The study and consideration of the question of transportation of rats in cargo originating in foreign ports and later arriving in the Philippines was given considerable attention again this year. A survey of arriving cargo was made under the personal supervision of an officer of this service who conducted an examination of arriving cargo on board the vessels while being taken out of the hold to see if any rats escaped from the cargo while being handled on board the vessel on the pier immediately after discharge from the vessels, and while distributed or stored on the pier and also in the custom-house while the cargo was being unpacked and examined by the custom appraisers. Warehouses were visited and inquiries made with regard to the finding of rats in cargo which arrived from abroad with negative results. The study included the types of packing boxes and other containers as well as the possibility of improving those in use without prohibitive expense, in order to make them more rat proof. During the three months over which the investigation was conducted no rats were found in the cargo examined, and it is as yet undetermined whether this particular factor of commerce plays as important a part as has been supposed. The campaign, however, to provide rat-proof containers is being continued and in some instances with a very gratifying measure of achievement. Shipments in the last year from Amoy, profiting by the recommendations made, have arrived in at least 50 per cent better condition as regards rat proofing than has ever obtained before. Baskets in which vegetables, eggs, and fruits are shipped are now being made with a mesh too small to permit the passage of mice or small rats.

CHOLERA-CARRIER SURVEY.

One of the important pieces of work which was carried out by this bureau during the past year was a cholera-carrier survey, which was made to determine the probable presence of cholera carriers among the crews of cascoes, lighters, and other small vessels used in

loading and discharging ships, and also among the crews of interisland vessels. This work was continued uninterrupted during the year. The number of specimens taken per month and the cholera carriers found was as follows:

Month.	Specimens taken.	Positive cholera carriers.	Month.	Specimens taken.	Positive cholera carriers.
1916.			1917.		
July	1,934	8	January	312	.....
August	1,279	3	February	252	.....
September	1,437	.....	March	457	.....
October	885	.....	April	80	.....
November	898	.....	May	80	.....
December	644	.....	June	110	.....
			Total	8,368	11

This taking of specimens to be examined for cholera organisms was accompanied by a rigid inspection of the sanitary conditions prevailing on the small craft surveyed and resulted in a much improved situation, the inspecting having a prophylactic effect because vessels were visited at irregular times to see that the instructions were carried out. Improved drinking-water containers were required to be installed on the various vessels, and instructions were given whereby quarantine might be avoided by promptly reporting cases of sickness. This resulted in the nonspread of infection.

INSPECTION OF INTERISLAND VESSELS.

The systematic sanitary inspections of the vessels engaged in the interisland traffic, including launches, tugboats, and the passenger vessels in the various ports of entry was continued during the year. The frequent inspections and instructions given the various members of the crews have resulted in a better sanitary condition of these vessels. Much remains to be accomplished, and it is the intention to continue this work to as large an extent as the limited facilities of the service will permit.

AID TO OTHER SERVICES.

The service in the Philippines was able from time to time during the year to cooperate with and render aid to a number of bureaus of the Philippine Government.

The service again passed upon all the certificates covering meat and meat products imported into the Philippine Islands from abroad for the food and drugs board and the bureau of customs. This work is conducted by this service on account of the fact that its offices are open at all hours of every day, and in view of the transportation facilities available to carry out such work as must be done on board arriving vessels.

The applicants for admission to the nautical school were physically examined and their vision and color perception tested. Typhoon signals were displayed at the quarantine stations, and a lighthouse station was maintained. A free clinic was operated for the poor at Mariveles. In addition to their regular duties medical officers have assisted in treating Government employees, assisted the work

of the bureau of science, and in the collection and diagnosis of lepers. Transportation was furnished when practicable, and vessels were disinfected for the bureaus of agriculture and health.

CAVITE AND OLONGAPO.

Inspection stations are maintained at Cavite and Olongapo for the convenience of the United States Navy, so that naval vessels arriving at those ports can be inspected there without first going to another port of entry. This work is conducted by Navy surgeons acting as quarantine officers and is a great convenience to the naval authorities.

Statistics for these ports for the fiscal year 1917 were as follows:

Cavite:	
Vessels inspected	18
Crew inspected	1,493
Passengers inspected	16
Bills of health issued	11
Olongapo:	
Vessels inspected	9
Crew inspected	857
Passengers inspected	47
Bills of health issued	6

CEBU QUARANTINE STATION.

The service at Cebu is in charge of a commissioned officer, with an office in the customhouse for the transaction of the service business and the various physical and other examinations which devolve upon the quarantine officers in the Philippines. In addition, he has charge of the quarantine station located on Cauit Island, which is about 4 miles from the water front of Cebu. Since the entrance of the United States into the war, the station has been occupied as a camp for the interned sailors from the merchant vessels which had taken refuge in the port of Cebu, and they remained there at the close of the fiscal year. Such hospital and dispensary services as are needed by the interned persons is furnished by the medical officer in charge. The station buildings, on account of their age, are not in the best condition; however, it is hoped that sufficient funds may be secured for the reconstruction of such as may be found necessary for the needs of the coming years. The quarantine transactions at Cebu for the year are partly shown by the following table:

Vessels inspected from United States ports	14
Vessels inspected from foreign ports	109
Vessels disinfected on account of disease	3
Vessels in quarantine	3
Vessels fumigated	96
Crew inspected on arriving vessels	6,702
Cabin passengers inspected on arriving vessels	388
Steerage passengers inspected on arriving vessels	942
Persons detained in quarantine under observation	112
Persons vaccinated at quarantine	88
Cases of cholera at quarantine station	23
Cases of smallpox at quarantine station	0
Seamen examined for licenses	53
Bills of health issued for vessels for foreign ports	38
Bills of health issued to vessels for United States	68
Interisland vessels inspected in port	341
Number of pieces cargo certified	151,300

ILOILO QUARANTINE STATION.

Iloilo is maintained as an inspection station at the present time. There are still no facilities at Iloilo for the treatment of vessels in a proper manner. The entire equipment is on hand stored in a warehouse awaiting an appropriation for the construction of a building to house the same and which was intended to be used also as a contagious disease hospital for the municipality of Iloilo. It is hoped that in the near future provision can be made for this very necessary building. The quarantine transactions at Iloilo for 1917 were as follows:

Vessels inspected	56
Vessels disinfected and fumigated	247
Vessels in quarantine	12
Crew inspected	3,121
Passengers inspected, cabin	27
Passengers inspected, steerage	359
Persons bathed and effects disinfected	130
Cases of quarantinable diseases detected	12
Bills of health issued	156
Sanitary inspection interisland vessels	412
Pieces cargo certified	436,214
Seamen examined for licenses	249

JOLO AND ZAMBOANGA.

At the ports of Jolo and Zamboanga there is considerable shipping with the nearby ports of Borneo and Strait Settlements. In view of the fact that these ports are almost continuously the centers of more or less virulent epidemics of quarantinable diseases, both Jolo and Zamboanga are important from a quarantine standpoint. The work at those ports is conducted by officers of the United States Army, acting as quarantine officers. No vessels arrived at either port from foreign ports with quarantinable diseases on board. Statistics for the year at Jolo were as follows:

Vessels inspected	35
Bills of health issued	47
Crew inspected	2,436
Passengers inspected, cabin	68
Passengers inspected, steerage	604

Statistics for Zamboanga were as follows:

Vessels inspected	16
Bills of health issued	26
Crew inspected	1,436
Passengers inspected, cabin	509
Passengers inspected, steerage	799

MANILA.

Manila continues to be a most active quarantine center. The transactions embraced all the various functions of the service and have been conducted with a minimum annoyance to the traveling public and almost entirely without opposition from the shipping interests. A study of the table of statistics will show the scope of the work performed on Manila Bay and in the quarantine office in the city of Manila. These figures do not include the work done at the Mariveles quarantine station, which is the detention and disinfection station for the northern part of the archipelago.

Manila transactions may be tabulated as follows:

Vessels inspected from United States ports	99
Vessels inspected from foreign ports	481
Vessels disinfected on account of diseases	20
Vessels in quarantine	2
Vessels disinfected	20
Vessels fumigated	150
Vessels given sanitary inspection in port	144
Crew inspected on arriving vessels	48,370
Passengers inspected on arriving vessels, cabin	11,815
Passengers inspected on arriving vessels, steerage	24,453
Persons detained in quarantine under observation	218
Persons vaccinated at quarantine	7,420
Applicants for marine licenses examined	444
Stool examinations made for hookworm	2,123
Stool examinations made for cholera carriers	5,368
Pieces of miscellaneous cargo certified	2,043,320
Bills of health issued to vessels for United States ports	204
Bills of health issued to vessels for foreign ports	433

MARIVELES QUARANTINE STATION.

At the Mariveles quarantine station there was not as much actual detention and disinfection work accomplished during the fiscal year 1917 as in some previous years. During the time the employees were not engaged in actual quarantine work they were employed in making routine repairs to the various buildings of the station. All buildings were kept in as fair a state of repair as funds allowed. A free dispensary for the benefit of the poor of the inhabitants of the contiguous territory was kept open throughout the year. Sanitation of the municipality of Mariveles was looked after and some very valuable improvements completed. Part of the work of the station is shown in the following table:

Vessels at the station for treatment	11
Vessels disinfected or fumigated	9
Persons bathed and effects disinfected	896
Pieces of baggage disinfected	1,006
Persons vaccinated	1,237
Persons detained in quarantine	207

PERSONNEL.

The service in the Philippines was directed during the year by Surg. J. D. Long, assigned as chief quarantine officer and in charge of the bureau of quarantine service for the Philippine Islands, also director of the Philippine health service. The personnel at the several stations continued practically as heretofore. With the exception of the officers all the employees are residents of the Philippine Islands. A number of resignations took place among the minor employees and their places were filled when necessary. Passed Asst. Surg. Hugh de Valin and Asst. Surg. Thomas F. Keating were relieved from duty in the Phillippines. Asst. Surg. H. M. Thometz was examined for promotion by a board convened at Manila.

DAILY PORT INSPECTION.

At all of the ports of entry the service conducts daily inspection of the water front, piers, and the anchorage of vessels with several ends in view, primarily to observe and compel the carrying out of

such measures while vessels are in port as will prevent rats from coming ashore from the vessels while at anchor or berthed at the piers or quays; and secondarily to prevent the dumping into the harbor of garbage and offal which later floats ashore and produces an insanitary and malodorous beach and breakwater, and also supplies food for the rats which naturally infest the vicinity of the water front. This work was carried out throughout the year with little opposition and with a considerable measure of successful accomplishment.

IMMIGRANT MEDICAL INSPECTION.

The officers of the quarantine service also conduct the medical inspection of aliens arriving in the Philippines. This work is performed at all the ports of entry. There were 6,223 inspections made and the rejections mainly for hookworm, trachoma and favus numbered 26.

There are no particular facilities for conducting this important work. The examinations are made both on board arriving vessels and in the offices of the service. Only such arrivals as are presented by the immigration officials are examined. The number of arriving aliens has remained steady, but there is a gradual and continued increase of the number of certain nationalities being admitted.

FLOATING AND OTHER EQUIPMENT.

One of the most important adjuncts to efficient quarantine work is proper and ample means of transportation, both land and water. The necessity of operating launches and boats for carrying out the various quarantine functions, in connection with arriving and departing vessels, and in transporting persons and supplies to the various quarantine stations is a source of considerable expense, demands constant skill, care, and supervision, and imposes considerable risk of loss of life and property during the rough weather, which prevails a considerable portion of the year, and during which quarantine work often seems to be the heaviest. Vessels used for boarding purposes in all kinds of weather are subjected to rough treatment and accidents are naturally frequent and damages unavoidable. However, the floating equipment of the service in the Philippines has been used very satisfactorily this year. The accidents and expenses of upkeep were below the average. The large boarding launch at Manila, now 18 years old, will soon be unserviceable and a new one is imperative.

National quarantine statistics, fiscal year 1917.

Port.	Steamers inspected.	Sail vessels inspected.	Total vessels inspected.	Vessels quarantined.	Vessels fumigated and disinfected.	Total passengers and crew inspected.
Manila	571	9	580	11	171	84,638
Cavite	18	.....	18	.....	.....	1,509
Olongapo	9	.....	9	.....	.....	904
Iloilo	56	.....	56	12	247	3,507
Cebu	123	.....	123	4	100	7,932
Zamboanga	15	1	16	.....	.....	2,744
Jolo	34	1	35	.....	.....	3,108

NAPLES, ITALY.

Surg. Ramus reports as follows:

During the fiscal year ended June 30, 1917, the public health at Naples and throughout Italy generally has been good, notwithstanding the increased hardships imposed on the population by war conditions. Cerebro-spinal meningitis has been present in many parts of Italy, but never in epidemic proportions. From November 13, 1916, to June 24, 1917, there had occurred throughout the entire country 3,328 cases. The mortality statistics were not furnished. It may be stated that the experience with serum therapy has been unconvincing.

An epidemic of acute intestinal disease of a doubtful nature occurred in the city of Florence during the winter months. No official information was furnished to the United States consular officers although several weeks had elapsed, but the statement is made that of several thousand cases there has been only one death. The low mortality rate, if correctly reported, would seem to eliminate the suspicion of cholera. The source of the epidemic has been alleged to have been due to a cargo of spoiled grain from America.

As far as official information is obtainable, quarantinable disease in Italy has been limited to smallpox and typhus. Neither of these diseases has occurred in serious proportions.

From time to time semiofficial reports were received of quarantinable disease in various ports of the Levant, which, in the absence of definite official reports, were regarded by the Italian Government as continuously infected with plague, typhus, cholera, and smallpox, and all steerage passengers coming therefrom are detained in quarantine by the Italian authorities for a period of 5 days and their baggage disinfected. In the case of those ports of the Levant considered infected with typhus the detention period is 12 days, and special measures are employed to destroy body vermin. In addition, steerage passengers from the Levant are examined bacteriologically to determine whether or not they are cholera carriers. During the fiscal year ending June 30, 1917, there were so examined 16,258 steerage passengers, of whom 43 were found to be vibrio carriers.

The Italian authorities enforce precautions against the introduction of plague from British India by the employment of rat guards on mooring lines, and the rats taken from such ships are examined bacteriologically by the Italian officials, as are likewise those rodents trapped in dock warehouses. Vessels from East Indian ports, calling at Naples, destined for ports in the United States, are required to be fumigated for the destruction of rats, or otherwise, a recommendation is written on the bill of health that fumigation be done at the United States port of arrival. Vessels from ports in the Levant, destined to United States ports are subjected to the same requirements as those applying to vessels from ports in the East Indies, with such additional measures as are indicated in individual cases.

The disinfection of baggage of emigrants destined to the United States is supervised by officers of the Public Health Service, and if the steerage passengers come from ports known to be infected with typhus fever the period of detention is extended to 12 days by the Italian authorities, and special attention is given to the destruction of body vermin.

The number of emigrants from Italy has continued, notwithstanding the increased danger of sea travel, and for the fiscal year ending June 30, 1917, there was an increase over the previous fiscal year of 2,338 persons. Since the entrance of the United States into the European war the American consul vises the passports of all emigrants to the United States, and in the exercise of this new procedure medical questions not infrequently arise which are referred by the consul to the medical officer of the Public Health Service attached to the consulate.

During the year the service representative on duty at Naples not only has given out-patient relief to American seamen, but likewise to British and French seamen, as there is no British or French medical officer on duty at Naples. From the outset of the war, April 6, 1917, to June 30, 1917, 12 seamen of the allied nations were treated in the out-patient office and 7 who were seriously sick were visited on board their respective vessels.

Statistics of the service at Naples, Italy.

Ships.	Emigrants.		Baggage.	
	Inspected.	Embarked.	Inspected.	Disinfected.
192	36,621	35,760	26,959	30,782

Rejections recommended.

Trachoma.	Favus.	Suspected trachoma.	Measles.	Other causes.	Total.
496	32	93	1	239	861

Statistics of the service at Palermo, Italy.

Ships.	Emigrants.		Baggage.	
	Inspected.	Embarked.	Inspected.	Disinfected.
28	4,104	3,990	3,641	1,299

Rejections recommended.

Trachoma.	Favus.	Other causes.	Total.
76	2	36	114

Emigrants from the Levant for the United States held in observation at the detention house, Naples, during fiscal year ending June 30, 1917.

Number in observation.	Number embarked.	Recommended for rejection.	Not embarked for reasons other than medical.	Still under observation June 30, 1917.
16,258	15,642	296	245	75

Ponce (P. R.) quarantine.—Acting Asst. Surg. Julio Ferrer Torres in charge.

Summary of transactions.

Number of vessels inspected	94
Number of vessels held in quarantine	10
Number of vessels fumigated to kill rats	1
Number of packages of onions, garlic, potatoes, and other rat-carrying cargo fumigated	6,178
Passengers inspected	4,514
Crew inspected	5,781
Immigrants inspected	62
Bills of health issued	114
Service patients treated in hospital	7
Service patients treated at out-patient office	27

Vessels from suspicious ports of Central and South America have been held in quarantine, but were not disinfected as they remained in port only a few hours, transacting business under guard, and had only such communication with shore as was necessary and not considered dangerous. Bills of health were issued to all vessels sailing for American ports and other ports when application was made for same. Weekly sanitary reports were made of the sanitary condition, mortality, etc., of this district. All cargo likely to contain rats, such as onions, sacks of corn, potatoes, etc., arriving at this port from ports of Spain and the Balearic and Canary Islands, also cargoes arriving from South American ports likely to contain rats, have been fumigated at this port.

OPERATIONS OF THE SERVICE IN PORTO RICO.

Service operations in Porto Rico for the fiscal year embraced, as in the previous year, quarantine, marine-hospital relief, medical inspection of immigrants, medical inspection of seamen, and miscellaneous duties.

QUARANTINE.

The service maintains quarantine stations at San Juan, Ponce, Mayaguez, Aguadilla, Fajardo, Humacao, Arroyo, Guanica, and Jobos (Aguirre). Immigration inspection is done at all these ports, but hospital relief is furnished only at San Juan and Ponce.

Quarantine is the most important phase of the service operations in Porto Rico. The medical officer in charge at San Juan is the chief quarantine officer of Porto Rico and has under his supervision and direction all quarantine matters at the other ports. At San Juan is maintained the only quarantine station in Porto Rico, located on Miraflores Island, in San Juan Bay. It is equipped with quarters for officers and attendants, detention quarters, disinfecting and fumigating apparatus, etc. An administrative office is located in San Juan, in the old naval station, occupying a commodious building belonging to the service. Here are located also the out-patient dispensary and a small station laboratory.

Fumigation of vessels.—Under the provisions of bureau circular of August 4, 1913, vessels from certain ports have been fumigated before being allowed to dock. They are mostly small sailing vessels from West Indian ports. Sulphur is usually used, but lately hydro-

cyanic gas has been satisfactorily substituted in several special instances.

Other vessels from ports included in the provisions of this circular which make Porto Rican ports only as ports of call are prohibited from docking but are allowed to transact business while at anchor in the bay, provided precautions are taken to prevent rats being carried ashore.

Vessels coming within the requirements of fumigation at six-month intervals are fumigated at San Juan or at the United States port, as may be convenient.

Fumigation of cargo.—The fumigation of cargo for rats, which was put in force during 1913, has been continued. At San Juan hydrocyanic gas is used; at Ponce and Mayaguez, sulphur dioxide gas.

The method of fumigating this cargo inaugurated during the past fiscal year has been continued with very satisfactory results to both quarantine officials and importers. Full details of the method, including the experiments to determine its efficiency, have been made the subject of an article sent to the bureau for publication by Asst. Surg. Carl Michel.

Special yellow-fever measures.—For some years the ports of Venezuela have been considered to be endemic centers of yellow fever, and vessels from those ports were held in quarantine at Porto Rican ports, being allowed to transact business under certain restrictions while anchored in the bay. Nonimmune passengers were detained to complete the six-day period of observation. Reliable information having been received which gave good grounds for believing Venezuela, except possibly the port of Maracaibo, to be free from yellow fever, recommendation was made that these special restrictions be removed, except in the case of vessels from Maracaibo. Upon bureau approval of the recommendations the restrictions were recently removed.

Outgoing plague quarantine.—After the eradication of plague in Porto Rico, the outgoing quarantine restrictions were modified on different occasions until at present the measures are fumigation of vessels for the destruction of rats every six months, and the use of rat guards on the lines when vessels are moored alongside piers.

Bills of health.—Bills of health are issued by service officers at Porto Rican ports to all vessels destined to ports in the United States.

Smallpox.—The smallpox epidemic mentioned in the report of the past fiscal year continued into the present year, but within a short time had ceased to be epidemic. Occasional cases have been reported from various points in Porto Rico throughout the fiscal year. Quarantine restrictions at United States ports on account of smallpox in Porto Rico were removed August 10.

Poliomyelitis.—During the epidemic of poliomyelitis in New York, there was great fear in Porto Rico that the disease would be carried to Porto Rico. To prevent this, if possible, the chief quarantine officer and the director of sanitation of Porto Rico inaugurated a system of inspection of passengers from New York.

The quarantine officers boarded incoming vessels; inspected passengers especially children under 15 years of age; verified their certificates of residence, etc. The destination of the passenger in

Porto Rico was noted on a copy of the passenger list, which was turned over to the director of sanitation. The director of sanitation, through the health officers of the various towns and districts, was able to have passengers under daily observation during the incubation period of the disease and was prepared to immediately isollate any case that might have occurred. No case was found either at the primary or at the secondary inspection and these measures were discontinued upon the cessation of the epidemic in New York.

Measles.—A severe epidemic of measles began in San Juan in February and continued in epidemic form till April, and later spread to many towns in the island, assuming epidemic proportions in some places. The number of cases was variously estimated, but amounted to several thousand, and the epidemic was marked by a high infant mortality.

Leprosy.—Leprosy is endemic in Porto Rico, but the cases are not very numerous. Lepers are isolated on Cabras Island, at the entrance of San Juan Bay, as soon as the diagnosis is positively made. At present there are 34 patients so segregated.

Disease on vessels.—But one vessel arrived with quarantinable disease on board—the Spanish steamer *Montevideo* with a case of smallpox from the Canary Islands. During the fiscal year the following nonquarantinable diseases were found on arriving vessels: Malaria, three cases; typhoid fever; lymphadenitis of gland of groin, chronic; bronchitis, acute; indigestion, acute; and valvular disease of heart (mitral insufficiency); one case each.

PLAGUE ERADICATION

No human or rodent has been reported in Porto Rico during the year.

The laboratory examination of rodents has been continued by the sanitation service of the insular government. The weekly statements from July 1, 1916, to June 29, 1917, show 5,636 rats, 707 mice, and 4 mongoose examined, with negative results. The majority of these rodents were caught in San Juan and the suburbs of Puerta de Tierra and Santurce.

STATION REPAIRS AND IMPROVEMENTS

The needs of the station for water have been so greatly increased that the well and spring which formerly supplied sufficient water were found inadequate, especially during a prolonged dry season. To provide an adequate supply a 3-inch water main has been installed connecting with the city water system.

Gas mains have been laid to the station buildings and gas is now used for fuel, resulting in a saving over the use of coal.

A portion of the roof of the brick and cement reservoir, a construction dating back about 150 years, fell in, and the entire roof was found to be weakened and was rebuilt of concrete.

The buildings constructed in 1913 required extensive repairs including reconstruction of a large portion of the disinfecting building. The brick of the wall exposed to the rain were of such a poor quality and had dissolved to such an extent as to threaten to fall.

The galvanized-iron roofs of these buildings had always leaked and various expedients failed to stop the leaking. New tile roofs have now been substituted which give every satisfaction.

The roadway to the mainland has been regraded and resurfaced, and repairs and improvements have been carried out on the grounds.

Contracts have already been let for a steel flagpole to replace the present wooden pole, and for an iron gate in place of the wooden gate which closes the land approach. Contracts have also been let for repairs and painting of various buildings.

OTHER OPERATIONS.

Other operations at this port have been routine matters, such as marine-hospital relief, medical inspection of seamen, medical inspection of aliens, etc., which are given in the statistical table under their proper headings.

At the request of the Commissioner of Immigration, medical attendance was given to the German sailors interned at that port after the declaration of war until their transfer to New York.

Summary of transactions.

San Juan:	
Steam vessels inspected	398
Sailing vessels inspected	110
Vessels held in quarantine	40
Vessels fumigated	40
Net tonnage of vessels fumigated	25,524
Rodents recovered after fumigation	52
Packages of cargo fumigated to kill rats	34,869
Crew inspected	25,567
Passengers inspected	29,978
Passengers detained for observation	712
Total number of days passengers in quarantine	1,768
Cases of sickness (nonquarantinable) occurring among passengers in quarantine	[1] 8
Number of vessels arriving with quarantinable disease on board (smallpox)	1
Number of cases of smallpox on above vessels	1
Bills of health issued	375
Immigrants inspected	3,966
Immigrants certified	31
Certified immigrants landed	25
Certified immigrants deported	6
Certified immigrants held pending disposition	2
Ponce:	
Steam vessels inspected	61
Sailing vessels inspected	33
Vessels held in quarantine	10
Vessels fumigated	1
Packages of cargo fumigated to kill rats	6,178
Crew inspected	5,781
Passengers inspected, incoming	368
Passengers inspected, transit	4,146
Bills of health issued	114
Immigrants inspected	62
Immigrants certified	[2]
Certified immigrants landed	[2]

[1] Cases of sickness were: Lymphadenitis of glands of groin, chronic, 1; typhoid fever, 1; bronchitis, acute, 1; indigestion, acute, 1; valvular disease of heart (mitral insufficiency), 1; tertian malarial fever, 3.

[2] None.

Ponce—Continued.	
Certified immigrants deported	(1)
Service patients treated in hospital	7
Days relief furnished	162
Service patients treated at out-patient office	27
Times relief furnished	81
Mayaguez:	
Steam vessels inspected	50
Sailing vessels inspected	43
Vessels held in quarantine	30
Vessels fumigated	1
Packages of cargo fumigated to kill rats	1,063
Crew inspected	3,227
Passengers inspected, incoming	404
Passengers inspected, transit	650
People held in quarantine	36
Deaths among passengers or crew	1
Bills of health issued	38
Immigrants inspected	47
Immigrants certified	(1)
Arecibo:	
Vessels inspected	1
Crew inspected	36
Bills of health issued	9
Aguadilla:	
Sailing vessels inspected	10
Crew inspected	96
Bills of health issued	12
Passengers inspected, incoming	7
Fajardo:	
Sailing vessels inspected	80
Crew inspected	360
Passengers inspected, incoming	280
Passengers inspected, transit	50
Bills of health issued	91
Immigrants inspected	217
Immigrants certified	1
Humacao:	
Sailing vessels inspected	18
Crew inspected	143
Passengers inspected, incoming	(1)
Passengers inspected, transit	(1)
Bills of health issued	21
Immigrants inspected	(1)
Immigrants certified	(1)
Arroyo.	
Sailing vessels inspected	2
Crew inspected	10
Bills of health issued	19
Immigrants inspected	3
Guanica:	
Steam vessels inspected	173
Crew inspected	8,202
Passengers inspected, incoming	886
Immigrants inspected	117
Immigrants certified	(1)
Certified immigrants landed	(1)
Certified immigrants deported	(1)
Jobos (Aguirre):	
Steam vessels inspected	1
Sailing vessels inspected	2
Vessels held in quarantine	(1)
Crew inspected	16
Bills of health issued	21

[1] None.

PROGRESO, MEXICO.

Acting Asst. Surg. H. E. Gimler reports that during the period April 1 to June 30 there cleared from Progreso for ports in the United States some 48 vessels, of which 34 were fumigated prior to sailing.

Every effort has been made to facilitate the dispatch of ships to United States ports and to overcome the difficulties existing in this port, due to the fact that all ships are dispatched in an open roadstead, where work is very much interfered with by weather conditions.

The acquaintance of the Mexican health authorities both in Progreso and Merida has been cultivated in order to obtain information concerning the general health conditions and especially the existence of yellow fever in Progreso, Merida, and the interior of Yucatan. The policy of the Mexican authorities has been adverse to the publication of the existence of yellow fever, in order to prevent the imposition of quarantine measures at ports in the United States. The local government, through the agency of the Reguladora Hemp Co., operates a steamship line to the port of New Orleans which is called the "Compania de Navigacion del Sureste."

Up to the present date no cases of yellow fever have been reported in this district, excepting one case, which occurred in the town of Peto, Yucatan, on June 23. However, it is to be expected that more cases of yellow fever will develop in the near future, due to the immigration into this district of about 6,000 laborers from the high country around Mexico City during the last three months.

SHANGHAI, CHINA.

Temporary Acting Asst. Surg. John Overton reports as follows:

During the fiscal year ending June 30, 1917, the Public Health work of this office shows a very decided increase in all but two phases.

Disinfection of vessels for destruction of rates, fleas, etc., has been done as heretofore by the Shanghai Disinfecting Co., which has a very modern and efficient plant.

In the great majority of cases this was done by sulphur generated by burning in small iron pots. In a few instances the sulphur was generated in the plant of the disinfecting boat and pumped in; in 5 instances carbon dioxide was used to disinfect the holds and sulphur gas for the forecastles, the last method being used in loaded vessels where sulphur might have injuriously affected cargo. As in previous year there were 307 large lighters fumigated twice; these lighters are registered, and vessels loaded for the States are required to use only them if they expect to get a clean bill of health. There were also fumigated 84 small native lighters for use to carry cargo destined to American or Philippine ports.

No vaccination certificates were issued because there were so few cases of smallpox at this place that it was not necessary to insist upon this precaution. There were no cases of suspected quarantinable diseases which require any attention. One case of suspected beriberi was detained and kept in hospital for treatment. All shipping orders and manifests of cargo destined for an American port require signature of the officer on duty here, and articles requiring certificates as to

their state or of disinfection are checked up here so as to meet requirements for admission at port of entry. Hides, skins, human and animal hair, bristles, old personal effects, household goods and embroideries, and cases which use straw in packing, are carefully watched and cleared up.

At present the requirements set forth in circular No. 491 are closely adhered to in the treatment of hides.

Vessels bound for the United States, whether they lie in stream or at wharf, are required to use measures against rat invasion, such as loading only from registered lighters and using rat guards. If at wharf they are required to fend off 6 feet, use rat guards on lines to wharf and lighters, to have a foreign watchman, under supervision of this office, on duty continuously; to raise gangways at night; to work cargo in day as near as possible; to limit communication between boat and shore as much as practicable.

Any vessels which become empty here are advised to fumigate. This is generally done, but a few prefer to be disinfected at port of entry.

Vessels are inspected as nearly as possible to the time of sailing.

The general health of the settlement is good, the number of communicable diseases being about the average. There have been reported 22 cases of smallpox among foreigners, and a few have died. There were 57 cases of death reported among the natives.

No cases of human or rat plague found.

Two deaths of cholera among natives reported in August. There were 14 cases of tuberculosis among foreigners reported and nearly 1,200 deaths among the natives.

Over a hundred cases of dysentery among foreigners and 89 deaths among natives.

Other diseases appear occasionally, as reported last year.

Rinderpest and foot-and-mouth disease are present most of the time to variable extent.

Anthrax was reported in a few cases among horses and cattle in this settlement.

Summary of transactions.

Vessels inspected	179
Crew inspected	22,972
Passengers inspected	20,566
Vessels fumigated	32
Bills of health issued	191

TAMPICO, MEXICO.

Asst. Surg. M. S. Lombard reports as follows: From April 1, 1917 (the beginning of the close quarantine season), to June 30, 1917, the transactions of this office were as follows:

Bills of health issued	318
Vessels fumigated with sulphur dioxide	172
Vessels fumigated with hydrocyanic acid gas	17
Vessels inspected without fumigation	41
Vessels inspected but not fumigated (on account of being docked at localities not infested with aedes calopus)	88
Passengers examined and passed and the quarantine officer at port of destination notified by letter	42

Every effort has been made to secure information as to the prevalence of quarantinable disease, especially yellow fever. Thus far the disease has not been reported in Tampico, nor has there been any evidence presented to indicate its existence.

The chief activities of the service representative have been confined to the inspection of personnel and the treatment of vessels prior to sailing so as to render them free of mosquitoes, in accordance with bureau circular letter of March 16, 1917. The authority of the referred to circular has also been exercised in exempting from fumigation vessels which have lain at wharves above or below the city of Tampico at the various oil terminals, and which have not been exposed to mosquito infestation. The expense of the fumigation of vessels has been borne by the shiping interests, and for the purpose of carrying out this procedure the services were secured of three ex-employees of the United States Public Health Service who formerly had served at New Orleans on the plague eradicative force at that place. These specially qualified men were under the supervision of the service representative and complied with his instructions as to all measures carried out in the fumigation of vessels.

Vessels sailing for the United States that had been exposed to mosquito infestation were fumigated prior to departure either by sulphur dioxide or by hydrocyanic acid gas. The shipping interests of Tampico, realizing the many advantages of the use of cyanide gas, have made an effort to secure sufficient sodium cyanide to fumigate all vessels outbound.

The population of Tampico is estimated at 50,000. The city is located on the Panuco River, about 6½ miles from the Gulf. It is provided with electricity and an underground sewage system, and receives its water supply from the Tamesi River, the pumping station being about 24 kilometers north of the city. The Ultra-Pura Water Co. furnishes drinking water, treated with ultra-violet rays, at the rate of 50 cents for 5 gallons.

The vitality statistics are not entirely dependable, but such as they are would indicate during the past three months an annual death rate of about 30 per 1,000, one-quarter of the mortality being due to malaria infection. Gastro-intestinal diseases and tuberculosis also account for a considerable number of deaths.

TUXPAM, MEXICO.

Acting Asst. Surg. A. J. Hoskins reports as follows:

TRANSACTIONS.

Vessels inspected	176
Vessels fumigated	53
Total personnel inspected	7,760

All vessels referred to are tank steamers used in conveying crude oil, and fumigation is confined to superstructure only. The sanitary condition of the port of Tuxpam is fair, but is not improving. All vessels are loaded at sea from one-half to 1 mile from shore.

VERA CRUZ, MEXICO.

Acting Asst. Surg. L. B. Cooke reports as follows:

Owing to the entry of the United States into the European war and the consequent restrictions placed on immigration, the number of

passengers from Vera Cruz to United States ports during the period April 14 to June 30 was only 65. Notwithstanding this small number for the United States there sailed on vessels bound for American ports 3,122 passengers for Progreso, Habana, and Barcelona, the large majority being for Progreso and being almost wholly composed of laborers and their families gathered up throughout the interior of Mexico, many of them from the much congested and typhus or smallpox-ridden cities of the Mexican plateau. They are sent under contract to labor in the Government-controlled sisal fields of Yucatan, and are entirely of the lowest classes, many of them being old and infirm and having the cutaneous evidences of syphilis and other diseases, as well as having pretty generally disseminated among them the various types of pediculi.

These people are transported from Vera Cruz with but little care, from 300 to 600 being herded on the deck of small schooners or steamers, practically no attention being given to sanitary considerations. Under these circumstances it has been found physically impossible to satisfactorily inspect each individual. The service representative has, therefore, attempted to compensate by requiring the strictest segregation of passengers bound for the United States, together with their baggage, and arranging with the steamship agents concerned to have all passengers for the United States, sailing on such immigrant vessel, freshly vaccinated previous to embarkation.

All efforts directed toward interesting the local health authorities in instituting measures for eradicating lice among these steerage passengers have entirely failed, thorough disinfection of the vessel at Progreso after discharge of the passengers seeming to be the chief measure to be relied upon in preventing the spread of disease from this source.

So far no case of either typhus or smallpox has been reported aboard these immigrant vessels, and it would seem that the measures instituted have been entirely efficient.

Summary of transactions.

Steamships inspected and issued bills of health	20
Sailing vessels inspected and issued bills of health	1
Steamships fumigated for destruction of mosquitoes	3
Sailing vessels fumigated for destruction of mosquitoes	1
Passengers examined bound for the United States	65
Total number of passengers examined	3,187
Total number of crew examined	1,325

Medical Inspection of Immigrants.

During the fiscal year ended June 30 there were examined by medical officers of the United States Public Health Service 528,648 immigrants for the purpose of detecting disease and physical or mental defects, in accordance with the provisions of the United States immigration laws. This number of aliens examined, as compared with 481,270 for the previous year, shows an increase of 47,378. The number of immigrants certified for disease or physical or mental disabilities was 20,261, in contrast with 16,327 so certified during the preceding year.

In addition to the immigrants examined there were also examined, as provided in the act of February 5, 1917, 41,693 alien seamen.

The number of officers assigned to the medical inspection of immigrants has varied during the year, but on an average some 82 officers were exclusively engaged in this duty. In addition to this a number of service officers stationed at marine hospitals and quarantine stations also perform medical examinations. The various officers stationed at consulates in foreign ports likewise made physical examinations of intending immigrants, in order that the latter might be aware of any conditions which would operate to their exclusion, and also in order that the shipping agents might be advised of any defect that would tend to prevent the admission of aliens into the United States. This function as carried out at foreign ports tends to prevent loss of time and money to the alien, and it is likewise of some assistance to the steamship companies in avoiding penalties provided in the United States immigration law against common carriers for bringing in certain defective aliens.

The reduction of immigration during the past three years has afforded greater opportunity to medical officers for performing more intensive examinations of arriving aliens, especially as to their mental condition. As an index of the increasing efficiency of the medical examination of arriving aliens, there are given in the following table the percentages of defectives, both mental and physical, recorded at all the immigration stations by officers of the Public Health Service in the period 1912 to 1917.

Fiscal year.	Total immigrants examined.	Total immigrants certified.	Percentage of all immigrants certified.	Number certified for mental defect.	Percentage of certifications for mental defect.
1912	1,143,234	27,021	0.0236	286	0.0105
1913	1,574,371	38,558	.0244	883	.0229
1914	1,485,957	41,250	.0277	1,360	.0329
1915	562,263	17,840	.0317	606	.0339
1916	481,270	16,327	.0339	573	.0350
1917	528,648	20,261	.0383	496	.0244

The statistics indicates a steady and progressive increase in the number of alien defectives discovered each succeeding year.

The new immigration law of February 5, 1917, became operative on May 1, and chiefly affected the service by the inclusion of a requirement for the medical examination of all alien seamen. The provision for the medical examination of aliens by not less than two medical officers likewise may necessitate an increase in the number of medical officers performing immigration examinations. The full effect of the alien crew inspection probably will not be felt until after the European war shall have terminated and immigration increases, but at the ports of New York, Baltimore, and San Francisco the demands of the crew examination have necessitated additional officers. At New York, for instance, during June there were inspected 6,799 immigrants and 16,028 alien seamen. This inspection of seamen has to be carried out on board ship and under conditions far from conducive to the satisfactory performance of the duty. Formerly a small force of officers was sufficient for performing the medical inspection of aliens on board vessels; that is, first and second class passengers and such alien seamen as had indicated their desire to

land. Cargo ships that carried no passengers were boarded by medical officers who had ample time to attend to any matters concerning the medical inspection of aliens and return to the boarding cutter while it was still alongside. In this way, medical officers were not required to stay on board the usual tramp or freight steamer, but could successively board a number of this class of vessels. Under the new law all this is changed. The medical officer has to stay aboard these vessels to conduct the medical inspection of all alien crew, regardless of whether they may or may not contemplate landing in this country. When it is considered that some of the trans-Atlantic liners before the war carried crews numbering several hundred, approximating almost 1,000 in some cases, it is evident that at the larger seaports the medical inspection of aliens after the resumption of uninterrupted commerce will necessitate a medical force very much larger than that heretofore employed. The inability of assembling the crews at one point for conjoint inspection, such as is done in the inspection of steerage passengers, greatly adds to the difficulty of the work.

A board of officers was convened at New York by the Surgeon General for the purpose of revising the regulations governing the medical inspection of aliens and making them conform to the act of February 5, 1917. The work of the board was exceedingly thorough and painstaking, and as a result there was prepared a set of regulations which it is believed effectively cover all the essential points involved in the medical inspection of aliens and the conduct of the examination.

Surg. Mullan during the year made valuable contribution to the general knowledge of mental diseases through the preparation of studies on the normal mentality of the various races as evidenced by the classes arriving at the New York immigration station.

A manual for the guidance of service officers in determining mental diseases was likewise prepared from collaborated studies by various officers at Ellis Island.

Aliens inspected and certified at all ports and places in the United States and its dependencies and in Canada.

	Number of aliens examined.	Aliens certified.					Important diseases for which certification was made.										
		Class A. (1) Idiocy, imbecility, feeble-minded, epilepsy, insanity, and tuberculosis.	Class A. (2) Loathsome contagious or dangerous contagious.	Class B. Disease or defect which affects ability to earn a living.	Class C. Disease or defect of less degree.	Total.	Trachoma.	Tuberculosis.	Insanity.	Idiocy.	Imbecility.	Epilepsy.	Feeble-minded	Favus.	Syphilis.	Tinea tonsurans.	Gonorrhea.
Aguadilla, P. R.	8																
Arecibo, P. R.																	
Arroyo, P. R.	3																
Astoria, Oreg.	326																
Baltimore, Md.	218	1	6	4	3	14	1	1									4
Biscayne Bay(Fla.)quarantine	3,055	4			1	5											
Blaine, Wash.	88					18	1		1	1							
Boston, Mass.	12,446	17	23	483	1,041	1,564	7	5	3			1	8	5			2
Brownsville, Tex.	6,279	12	633	237	73	955	7	1		1			3		1		4
Buffalo, N. Y.	9,179	27	20	554	370	971	4	4	3			4	1		5		7
Calexico, Cal.	1,051					50	2	6	1		1				16		5
Charleston, S. C.	38	1	4	5		10			1								3
Chicago, Ill.	32	2		2	5	9							2				
Del Rio, Tex.	3,579					31	23										
Detroit, Mich.	6,844	53	39	519	345	956	13	1	13	1			35		1		22
Douglas, Ariz.	8,113	3	73	2	4	82	66				1	1	1		2		1
Duluth, Minn.	3,480	3		7	32	42		2	1								
Eagle Pass, Tex.	16,753	14	28	25	73	140	21	3	1			2	3		3		
Eastport, Idaho	3,259	5	1	394	12	412	1	4					1				
El Paso, Tex.	44,289	79	110	482	119	790	31	49	10			7	13	48	19		9
Everett, Wash.	23																
Fajardo, P. R.	215		1			1	1										
Galveston, Tex.	331	2	4	4		10			2						1		1
Guanica, P. R.	117																
Halifax, Nova Scotia	3,378	9	5	42	44	100		1	1				5		2		4
Hidalgo, Tex.	5,704		309	28		337											
Honolulu, Hawaii	4,552	1	196	112	20	329	170										1
Houlton, Me.	54					6											
International Falls, Minn.	265	8		10	10	28							3				
Ketchikan, Alaska	1,926					3	2										
Key West, Fla.	7,784		2			2	2										
Laredo, Tex.	41,284	11	124	149	155	439	102	1	1		1	1	7		7		4
Los Angeles, Cal.	1,152		1	1		2											1
Marcus, Wash.	893	2	3	75	25	105						2					3
Mayaguez, P. R.	47																

Mobile (Ala.) quarantine	89					6											
Montreal, Canada	12,545	44	28	666	432	1,170	9	19	3	4	3	1	3		1	1	4
Naco, Ariz	7,063	2	43	1	2	48	31			1		1			6		5
New Orleans, La	5,018	6	61	66	52	185	4	2			2				6		2
New Orleans (La.) quarantine	637																
Newport News and Fort Monroe	813					15									15		
Newport, Vt	725	5	1	56	6	68			3			1			1		
New York, N. Y	160,105	240	488	4,302	178	5,208	304	49	41	4	19	6	118	2	31	5	39
Niagara Falls, N. Y	8,307	22	37	256	113	428	20	6	5			3	8		5		12
Nogales, Ariz	10,272	2	106	2		110	103		1				1		2		1
Norfolk, Va	614	7	62	17		86	1	6		1					14		31
Oroville, Wash	169					9											
Pascagoula, Miss	23																
Perth Amboy, N. J																	
Philadelphia, Pa	396	1	6			7									5		1
Philadelphia quarantine	5,233	2	36	106	8	152	7								1		7
Philippine Islands	6,223	24			2	26	21							2			
Pittsburgh, Pa	3																
Ponce, P. R	62																
Portal, N. Dak	3,073	11	9	183		203	5	2	1				2				
Port Angeles, Wash																	
Port Arthur, Tex	3,058					219	8	9	4			2			40		62
Port Huron, Mich	3,717	50	15	469	80	614	5		18		3	3	10		1		5
Portland (Me.) quarantine	195					2											
Portland, Oreg	13					1							1				
Port Tampa, Fla	4,090			1		1											
Port Townsend, Wash	16,546		198	30		228	18								12		19
Providence, R. I	5,296	4	2	261	102	369	2						4				
Quebec, Canada	609	3		13	5	21			1				2				
Rio Grande City, Tex	4,795					54	4	1	1						2		
St. John, New Brunswick	1,866	14	1	130		145		6	1			1	3		1		
St. Louis, Mo	46			1		1											
San Diego, Cal	910	1	1	1	1	4									1		
San Francisco, Cal	16,430	7	617	64	222	910	85	5	1						2		11
San Juan, P. R	3,966	3	6	8	14	31	1	1	1				1		2		
Sault Ste. Marie, Mich	1,370	10	8	42	55	115		2	3			2	2		2		1
Savannah, Ga	32					3									1		
Seattle, Wash	6,268	4	418	48	14	484	3	2					2		4		1
Sumas, Wash	983	14	6	2	77	99	9	3	4	1		1			1		1
Tacoma, Wash	122		1	2		3											1
Tampa Bay (Fla.) quarantine	681														1		
Tia Juana, Cal	4,110		9			9	5								3		
Tucson, Ariz	145	5	24	1		30	2		2				2		1		23
Vancouver, British Columbia	4,568	14	22	109	44	189	10				1	1					
Victoria, British Columbia	4,091					74		6					4		1		1
West St. John, New Brunswick	48																
Wilmington, N. C	32																
Winnipeg, Canada	10,984	55	12	1,236	133	1,436	5	19	10	2	2	13	9	1			3
Yarmouth, Nova Scotia	25,612	4		31	52	87		2				2					
Total	528,648	808	3,799	11,239	3,924	20,261	1,116	218	138	16	33	55	254	58	219	6	301

Alien seamen inspected and certified.[1]

	Inspected.	Certified.	Important diseases for which certification was made.				
			Trachoma.	Tuberculosis.	Insanity.	Syphilis.	Gonorrhea.
Baltimore, Md	7,694	309	8	6	.....	21	53
Boston, Mass	3,500	120	.....	.....	.....	.....	.....
New York, N. Y	16,028	103	29	5	2	4	23
Philadelphia, Pa	9,800	174	10	.....	.....	11	17
Tampa Bay quarantine	4,671	8	.....	.....	.....	1	.....
	41,693	714	47	11	2	37	93

[1] Month of June, 1917.

REPORTS FROM IMMIGRATION STATIONS.

BALTIMORE, MD.

Surg. J. A. Nydegger reports as follows: Owing to the continuation of the European war the medical examination of alien passengers has continued at a minimum throughout the year, the total number of immigrants arriving being 218, distributed on 1,479 vessels. In addition to the 218 alien passengers and 97 stowaways examined there were 7,694 alien seamen. Since May 1, the date on which the new immigration law became effective, the work at this station has greatly increased, notwithstanding the assistance of two additional medical officers for the purpose of conducting the medical examination of alien seamen on board their respective ships. The number of foreign vessels which arrived at this port during the year ended March 31, 1917, was 1,549, with officers and crews totaling 43,372. Based on these figures, it is estimated that the number of alien seamen to be examined throughout the year will approximate 45,000, making no allowance for a possible increase in the shipping.

Considerable difficulty was experienced during the early days of the medical inspection of alien seamen on account of the great extent of the port and the lack of suitable transportation facilities to the various docks widely separated on the water front. Through the assistance extended by the collector of customs service officers detailed for the medical examination of alien seamen were extended the facility of boarding from the customs cutter, and this arrangement has greatly expedited the work of the medical examination of alien seamen on board vessels. Construction of the immigration hospital at Fort McHenry is now almost complete and the building will shortly be ready for the installation of furniture and equipment.

During the year hospital treatment was recommended in the case of 10 foreign seamen. No other aliens were admitted to the hospital during the year, and no other deaths occurred. Of the 7,694 alien seamen examined, 307 were certified, 105 of whom were suffering from mandatorily excludable diseases, 66 from conditions affecting ability to earn a living, and 136 from minor defects. Of the 218 alien passengers examined, 7 were certified for mandatorily excludable diseases and 7 for other causes. Of the 97 stowaways examined,

8 were certified for mandatorily excludable diseases and 3 for other defects.

BELLINGHAM, WASH.

Acting Asst. Surg. L. R. Markley reports as follows:

The medical inspection of aliens at this port has very materially diminished. The duties of the medical officer are chiefly the inspection of "warrant" cases for the immigration service, and the examination of aliens applying for naturalization papers.

BOSTON, MASS.

Asst. Surg. M. Victor Safford reports as follows:

During the year there arrived at Boston from foreign ports 1,053 vessels of which 177 had alien passengers. Although the new immigration act requiring a medical examination of all arriving alien seamen did not go into effect until May 1, lack of advance information regarding arriving ships, owing to war conditions, necessitated provision for the boarding of practically all arriving vessels by a medical officer of the service during the entire year.

Immigration at Boston was derived the past year from countries bordering on the Mediterranean and from Portugal and the Portuguese possessions. To a great extent it was made up of persons who were in a poor physical condition, and so far as males were concerned nearly all had been exempted from military service by reason of age or physical disabilities.

One apparent result of the new immigration law with its severe penalties for the bringing of inadmissible aliens and its literacy test, which went into effect May 5, has been a reduction of the proportion of cases calling for medical certificates since that date and a disappearance to a noticeable extent of the type that it had previously been found necessary to hold in embarassing numbers for mental examinations.

The medical inspection of arriving cabin passengers has formerly been made on shipboard at this port, but during the past year they have as a rule been removed from shipboard ashore for the purpose of all the examinations contemplated in the immigration laws. This change in the method of handling cabin passengers has for a long time appeared to be desirable in the interest of greater efficiency in the immigration examination processes and especially in the medical examination. There were various practical difficulties to be considered in making this change, including its effect on the duties of the customs officials and apprehended objections on the part of the passengers themselves, but these difficulties have apparently been overcome and the new plan now seems to be working to the satisfaction of everybody concerned.

The character of the passenger travel at Boston with respect to classification on shipboard and necessity for medical certification is indicated in the following tables Nos. 1 and 2:

Table No. 1.

Class.	Number of citizens.	Number of aliens.	Total passengers.	Proportion of United States citizens.
				Per cent.
First cabin	251	278	529	47.4
Second cabin	569	2,266	2,835	20.1
Steerage	1,119	9,863	10,982	10.2
Stowaways	5	39	44	11.4
Total	1,944	12,446	14,390	13.0

Table No. 2.

Classification.	Number of alien arrivals.	Class A and B certificates.	Class C certificates.	Total.	Ratio certified.
First-cabin aliens	278	1	4	5	1:56
Second-cabin aliens	2,266	185	376	561	1:4
Steerage aliens	9,863	332	660	992	1:10
Stowaway aliens	39	5	1	6	1:6
Total	12,446	523	1,041	1,564	1:8

It is to be observed from the foregoing tables that while the number of alien passenger arrivals was slightly less than the preceding year there was an actual increase in the number of certificate cases, and this increase was in certificates of a more serious character. Compared with the previous year there was an increase in the number of second-class passengers. The proportion of this class of alien passengers certified remained, the same as for the previous year, at 25 per cent. The number of steerage passengers certified was 1 in 10, as compared with 1 in 11 for the previous year.

One thousand one hundred and twelve aliens, amounting to 8 per cent of the total alien arrivals, whose appearance aroused suspicions on arrival and whose medical examination could not be satisfactorily completed on the day of arrival, were brought to the immigration station or sent directly to the hospital for more careful investigation. Of this number it is to be noted that 560, or over one-half, eventually received medical certificates. The laboratory facilities at the immigration station were used chiefly for preliminary or confirmatory examinations. The eight local contract hospitals were utilized to a great extent for diagnostic work as well as for treatment.

During the latter part of the calendar year a number of children both from Italy and the Azores were certified for the effects of recent attacks of poliomyelitis. The histories of these cases pointed to the prevalence of this disease in both these regions during the season of 1916 and were suggestive of possible conveyance of infection by the summer passenger travel from this country.

Local epidemic outbreaks of malaria in New England, indicating the possibility of infection from recent immigrants, led the medical officers at Boston to undertake a closer examination for evidence of malarial infection among aliens coming from districts where the disease was known to be prevalent. A special study of this matter was made by Acting Asst. Surg. Riemer, but owing to the necessity of

attention to other daily routine duties it could not be made as comprehensive as was desired. It has been a regular practice at Boston to make examinations of the blood of all arriving aliens who appear anemic or in whose cases there otherwise appeared to be indications for a blood examination. Where there might be suspicions of malarial infection it had been the practice to make or have made microscopical examinations of fresh specimens or of stained thin smears of the blood. In addition to continuing this practice with greater care than previously, Dr. Riemer supplemented it by thick smear examinations, following the method of the late Surg. von Erzdorf, and by examining, so far as he could find opportunity to do so, the blood of persons from malarial districts who appeared healthy. Of the Greeks examined, including persons who were apparently in good health, Dr. Riemer found 20 per cent of malarial infection, and of the Italians, including also persons who were apparently in good health, 10 per cent showed malarial infection. Parasites of both the tertian and estivo-autumnal types of the disease were demonstrated, and some individuals who were carriers of the gamete forms of the latter type were apparently in robust health and, without treatment, gained in weight during their detention at the immigration station.

The transfer to the Boston immigration station of a considerable number of excluded African natives of the Cape Verde Islands gave an opportunity to study some of the diseases prevalent in these tropical islands, although before embarking the passengers had been subjected to a medical examination with view to preventing rejections on arrival here. Hookworm infection, as might be expected, appears to be common among these natives but by no means as prevalent as is to be found in some other tropical regions. Infection with intestinal parasites of some form or other is, however, practically universal. Infection with such parasites, including the hookworms, does not appear to be necessarily incompatible with apparent good health.

Routine blood and stool examinations made at the Carney Hospital during the year continue to indicate that while an eosinophelia does not necessarily mean hookworm infection, an absence of eosinophelia may be regarded as an absence of hookworm infection. With view to its practical value in immigration examination work observations on this matter have now been continued over several years, covering Europeans, Chinamen, Negroes, and others, and thus far in every case of hookworm infection found there has also been found an eosinophelia to a demonstrable degree, even though the hookworm infection may have been apparently slight.

In view of the part that the Cape Verde Islands have played in the Negro slave trade it may be of interest to note that the parasite found in natives of those islands is the *Agchylostoma duodenale*. From studies also made of an ulceration of the shins, with which practically all natives of those islands are afflicted at some time or other, it would appear that the disease is a form of leishmaniasis.

ALIEN SEAMEN.

During the last two months of the fiscal year the medical officers at this station have had to meet the problem of making the medical examinations of alien seamen on arriving vessels as required by the

new immigration act. So far as freight and passenger vessels are concerned, fairly satisfactory methods have been devised for carrying on this work, and its demands with respect to the time and services of medical officers can be estimated with a reasonable degree of certainty; but the problem arising from the practice of the large New England fishing fleet to bring to Boston aliens who to a great extent man this fleet and join the vessels at Canadian ports has not yet been touched. These vessels, both steam and sailing, are run on what virtually amounts to a partnership arrangement instead of signing crews on ships' articles, and the problem is further complicated by the fact that these vessels usually come into port during the night and are exempt from quarantine inspection and customs entry and clearance. The examination of alien seamen and fishermen arriving at the smaller subports in the Boston district also remains to be provided for.

The medical examination of alien seamen on freight vessels alone arriving at the port of Boston proper has been found to render the service of one of the three medical officers at the station practically unavailable for any other regular medical work from 7 a. m. until sunset, and not infrequently the absence from the station for several hours of two of the three medical officers. As a result it has been found necessary to give up practically everything in the way of laboratory work at the immigration station and otherwise curtail diagnostic work in the matter of both mental and physical examinations. Various propositions have been considered for lessening the demands of the medical examination of arriving seamen on the time of the medical officers. A brief experience has shown that the enforcement of the immigration laws require that the examination of seamen should at least be begun before or as soon as a vessel docks, and that it is impracticable for the purposes of administration of the law to defer this examination. Consequently the inspection of seamen on ship at this port entails the absence of a medical officer from the immigration station of from one to three hours. The extent of the water front, as well as the size and character of the ship examined, are factors in determining this matter.

It would seem advantageous to have the medical examination of seamen for the purposes of the immigration laws begun in conjunction with the quarantine inspection. But after realizing the length of time it is often necessary for a medical officer to spend on a freight ship if the objects of the immigration law are not to be virtually ignored and considering other work which both the quarantine and immigration officers of the service are now expected to perform at this port, and taking into account certain difficulties of a local character, the plan of having the immigration examination of alien seamen undertaken at quarantine, either by the quarantine officers or by having one of the medical officers at the immigration station sent to quarantine for this purpose, appeared to offer no advantage in saving the time or services of medical officers at this port over the practice which is now being followed of boarding ships at the immigration station.

The medical examination of alien seamen at Boston may be expected to call for the boarding of about 1,200 freight and passenger vessels a year. Conditions are even less satisfactory for making on

shipboard the required medical examination of the crew of a freight ship than for examining passengers on a passenger ship, and frequently it is obviously impossible to undertake the medical examination of seamen without removal to the immigration station or to hospital. In such cases the medical officer is likely to be confronted with the claim that the "seaman" in question does not intend to leave the ship, and that whereas the law specifically contemplates removal of passengers from shipboard for examination purposes at the expense of shipowners, it does not do so in the case of seamen. Without conceding anything to the claim that this particular law fails to provide the authority to make effective its specific requirement for a medical examination of alien seamen and yet offering a possible means of avoiding an unnecessary expense to shipowners and a waste of the time of the medical officers, the following procedure was adopted at this port in conducting the medical examination of alien seamen.

On boarding a ship the medical officer takes the following rubber stamps, each small enough to be included between the horizontal ruling on the official crew list and within the margin to the left of the space for names of the crew:

PASSED U. S. P. H. S.	MEDICAL CERTIFICATE.	MEDICAL EXAM. UNCOMPLETED.	NOT SEEN U. S. P. H. S.

Each alien on the crew list is subjected to such an examination as appears to be called for after inspection and as seems practicable to undertake on shipboard. If the examination can be satisfactorily completed on shipboard, "passed" or "medical certificate" is stamped in the left-hand margin of the crew list opposite the individual's name. Medical certificates are issued and delivered when and where requested by the immigration officer, but at the time of the examination a note is always made under remarks in the right-hand margin of the crew list opposite the individual's name indicating the nature of the certificate. When a satisfactory medical examination can not be made on the ship, and when the duty of completing the examination for the possible imposition of penalties or for providing suitable hospital care is not involved, "medical exam. uncompleted" is stamped on the crew list opposite the individual's name. By such use of this stamp the medical officer practically makes the seaman an inadmissible alien for the time being and forces upon the ship's representatives the choice of guarding the seaman subject to the penalties provided by law in the case of the escape of an inadmissible alien or of incurring the expense incident to the completion of the medical examination. Recourse to this procedure also tends to relieve a medical officer of the temptation to take chances and pass an individual when the indications for a thorough examination are not definite and the procedure may seem liable to result only in unnecessary expense and trouble to those concerned.

Since May 1, approximately 3,500 alien seamen have been examined at Boston. One hundred and twenty have received medical certificates and 25 have been left in the status of "medical examination uncompleted." While the proportion of certificate cases among seamen may be expected to increase somewhat as more efficient methods

of handling this proposition are developed, it is to be noted from the foregoing that the proportion certified has been small in comparison with passengers, and will undoubtedly remain so. Also, as might be expected, the experience of two months has shown that the detection of infection with venereal diseases and trachoma is going to be a much more important factor in the medical examination of seamen than it has been in the case of passengers. Seven cases of acute venereal disease have been found on a single vessel, and if the Wassermann test is to be used to the same extent as it has been among passengers when suspicions of syphilitic infection have been aroused, special provision for carrying on such work is needed.

IMMIGRATION STATION.

While the immigration laws do not contemplate any responsibility on the part of service officers for sanitary conditions at an immigration station or even provide for the medical care of detained aliens by service officers, it has been found in actual practice that the duties imposed by law with respect to the medical examination of aliens has rendered unavoidable the assumption of their medical care, and by thus having charge of both the examination and medical care of aliens, officers of the service are placed to a certain extent in a position of actual responsibility for health conditions at immigration stations that can not be escaped. Since the beginning of the war the immigration service at Boston has repeatedly been obliged to assume the custody and care of detained aliens in numbers far in excess of the designed capacity of the quarters provided for the purpose, and the time and attention of the medical officers have been largely diverted from the strictly legal duty of examining arriving aliens to attend to the treatment of the sick and devise schemes to check the spread of illness among those detained for any reason.

The detention quarters at this station consist of 2 dormitory rooms, one containing 204 three-tier berths and the other 124 berths. When occupied to berth capacity the former room provides an initial per capita air space of about 100 cubic feet and the latter of about 80 cubic feet. There are in addition 2 rooms of about the same dimensions intended for occupancy during the day and a room designed to provide temporary emergency hospital accommodations pending the transfer of cases to regular contract hospitals.

To the Boston detention station are brought not only detained aliens arriving at Boston but all those detained at Providence, New Bedford, and other New England subports as well. In addition to arriving aliens all aliens taken into custody in the New England district under department warrants of arrest are kept in these quarters, and since the declaration of war with Germany the Boston immigration station has come to serve the purpose of a repository for interned alien enemies. For these reasons, and owing to the practical suspension of deportations, the demand for detention accommodations has increased instead of diminished with the decrease of immigration, since the war began. In the meantime what was once an unimportant part of the duties of the officers of the service at this station has become a troublesome medical and sanitary proposition.

During the past year the number of persons held in the detention quarters has frequently exceeded 300, made up of persons of both sexes, and including a large proportion of medical certificate cases. On one occasion the number of inmates reached 382 and over 350 persons have been kept in these quarters for varying periods on several occasions. To make matters worse local hospitals have been unusually crowded during the year and the number of detained aliens actually in need of hospital care has at times exceeded available accommodations in the various hospitals. On this account it has been necessary to keep at the detention station many cases which should have been transferred to appropriate hospitals. At times the number of persons requiring daily medical or surgical treatment in the detention quarters has exceeded 40 a day. It has been necessary to keep constantly at the detention station communicable diseases of one sort or another and to trust to various devices to lessen the danger of their spread. Tonsilitis and catarrhal conditions directly attributable to overcrowding have been prevalent throughout the year, and middle-ear complications have been common. Symptoms of tonsilitis or in fact any inflammatory throat symptoms have been deemed sufficient to warrant the removal of persons from the station as soon as detected. Other precautionary measures have included daily inspections and examinations. Practically every detained alien has been examined stripped. Daily temperatures have been taken of all children and to a considerable extent of adults as well. In spite of all precautions on three occasions during the year diphtheria has developed in the detention quarters resulting in two deaths. On each occasion prompt and energetic measures were, however, successful in preventing any spread of the disease. These outbreaks of diphtheria were unrelated as to source of infection. Other contagious diseases that have developed at the station during the year have included scabies, measles, chicken pox and mumps, but a general spread of these diseases has been avoided. Even in the matter of mumps only two or three cases possibly attributable to infection in the detention quarters have occurred.

Acknowledgment is made of the cooperation and assistance rendered during the year to the officers of the service at this station by Commissioner of Immigration H. J. Skeffington, Deputy Commissioner J. J. Hurley, and by the immigration officers and employees under their charge. The faithful and efficient services of Acting Asst. Surgs. A. J. Nute and H. B. C. Riemer and of Clerk J. L. O'Neil also call for mention.

BUFFALO, N. Y.

Acting Asst. Surg. W. L. Savage reports as follows:

For the fiscal year ending June 30, 1917, the report of transactions shows a marked increase over that of last year. The medical officer, in addition to the medical inspection of aliens, is also called upon to care for and examine aliens detained by the immigration authorities in the county jail and other places of confinement.

The difficulties to the proper performance of the work at this office are lack of proper janitor service, the insanitary, foul-smelling condition of the lavatories throughout the building, lack of towels, soap, etc., dirty windows, no window screens, an abundance of shadflies and

common house flies, and mosquitoes; and the dirt and filth, noise and smoke necessarily connected with a building situated in a railroad yard. The schedule of passenger trains necessitates the medical officer being on duty from 12 to 14 hours at the office every day.

CALEXICO, CAL.

Acting Asst. Surg. A. L. Rice reports that during the fiscal year just ended 1,051 aliens were examined, the great majority of them being Mexicans.

Fifty cases were certified for deportation, 16 for syphilis, 5 for gonorrhea, 2 for chancroid, 6 for tuberculosis, 2 for trachoma, and 1 for insanity. There were 18 others, ranging over 14 different afflictions of lesser degree.

The feature of the year's work was the remarkable increase in the number of aliens examined, the number being more than double that of the previous year. The physical and mental standard of the incoming alien was also above the average.

DEL RIO, TEX.

Acting Asst. Surg. H. B. Ross reports as follows:

Immigration inspection at this port is performed at the international ferry situated about 3½ miles from Del Rio. Conditions in Mexico have not been so much disturbed as last year and the traffic has been more uniform. When the new immigration law went into effect the literacy test caused some friction but is now the source of less objection. During the year a total of 3,579 immigrants were inspected, of which number 31 were certified on account of disease or mental or physical defect. Of this number 23 were certified for trachoma.

DETROIT, MICH.

Acting Asst. Surg. K. L. Weber reports as follows:

For the fiscal year ended June 30, 1917, there were examined at this port 6,844 aliens.

Of the number examined 5,888 were passed and 956 were certified as follows: Class A (1), 53; class A (2), 39; class B, 519; class C, 345.

Aliens arrived at this port daily via 19 trains over 4 railroad lines, 2 ferryboat lines arriving every 10 minutes, and by lake passenger steamers.

In addition to the inspection of arriving aliens, the medical officer at this port renders medical aid to the United States immigration prisoners detained at the various hospitals, jails, and detention homes, and also examines aliens in and around Detroit who have become public charges, to determine if their condition is a result of causes existing prior to landing in this country.

During the year there were two medical boards convened for the reexamination of aliens—one by bureau order and one at the request of the medical officer.

DULUTH, MINN.

Acting Asst. Surg. F. L. Cheney reports as follows:

During the fiscal year ending June 30, 1917, 139 boats arrived at the port of Duluth and 3,480 passengers were examined. Of this

number 42 were found to have some physical defect or disease. Five were ordered deported, but 2 died before the time of deportation; all of these were in class A. The remainder were divided as follows: 7 in class B and 32 in class C.

In comparison to the past years the one just ended shows a marked dropping off in the total number of aliens arriving and the lowest in deportations.

Considering the unusual conditions with Canada interning all alien enemy and allowing but few of her own citizens the privilege of leaving her borders, the marked reduction is readily accounted for.

A striking fact is that 31 of the 42 certified were going to Rochester, Minn., for medical treatment.

EAGLE PASS, TEX.

Asst. Surg. C. R. Eskey, in charge, reports that during the past year 16,753 immigrants were examined at the immigration station. There were 140 certificates issued for physical and mental defects, divided under the following classes: Class A (1), 14; class A (2), 28; class B, 25; and class C, 73.

During the last two months (May and June) immigration through this port has decreased to one-third of that in the previous months of the year. Practically no laborers are entering at present. The reduction is apparently due to the new immigration laws and to the migration of Mexicans back to Mexico.

EASTPORT, IDAHO.

Acting Asst. Surg. N. L. A. K. Slamberg reports as follows:

Three thousand two hundred and fifty-nine immigrants were examined, an increase of 959 over the preceding fiscal year. Of these 2,847 were passed and 412 were certified, 5 in class A (1), 1 in class A (2), 394 in class B, and 12 in class C.

Remodeling of the office building has been contemplated for some time, and is planned for the near future. Upon request of the inspector in charge the medical officer has outlined the changes desirable in order to facilitate the medical examination of aliens. The necessity of a modern plumbing system and of adequate illumination has been emphasized, and it is to be hoped that the new arrangement will result in an improvement.

EL PASO, TEX.

Asst. Surg. J. W. Tappan reports as follows:

During the fiscal year ended June 30, 1917, there were examined at this station 44,289 immigrants, of which number 790 were certified as having physical or mental defects or disease. In addition, the increased facilities for enforcing the quarantine regulations has also resulted in improved opportunity for more careful immigration inspection.

EVERETT, WASH.

Acting Asst. Surg. James Chisholm reports as follows:

The duties pertaining to this port embrace the medical inspection and examination of alien passengers and alien crews; the medical

examination and inspection of apprehended immigrants who have gained surreptitious entry from Canada; and the medical examination and inspection of aliens applying for "nunc pro tunc" certificates of landing for naturalization purposes, who were not recorded at time of original entry by immigration officials.

During the fiscal year ended June 30, 1917, 1 steam vessel arrived from foreign port with 8 nonimmigrant alien passengers and 1 United States citizen passenger, all of whom were free from contagious and infectious disease.

During the period mentioned above there were examined at this port 14 immigrants, 6 of whom were in re naturalization, 7 were deported, and 1 is pending. These were apprehended immigrants, having effected surreptitious entry from Canada. The above immigrants were free from any contagious or infectious disease.

GALVESTON, TEX.

Surg. L. P. H. Bahrenburg, in charge of the medical inspection of aliens, reports that during the fiscal year immigration was almost at a standstill as a result of the belligerent conditions in Europe and Mexico.. A total of 331 aliens were examined, including 262 passengers (of the latter 121 were refugees from Mexico), 50 crew, 2 deserters, and 17 stowaways. Ten certificates were issued. No aliens were admitted to hospital during the year for treatment or observation.

HALIFAX, NOVA SCOTIA.

Acting Asst. Surg. T. W. P. Flinn reports as follows:

The work of the year has been characterized by the same conditions as to trans-Atlantic travel that have prevailed during previous years. There have, however, been several hundred returning seamen, horsemen, and cattlemen handled by this office last year, which, while requiring a great deal of time and attention, owing to conditions necessary for their examination, are not indicated in the annual report, this because of the fact that Halifax has been made a port for the examination of shipping under the control of the British Admiralty, enjoying a similar function to that of Kirkwall, England. In the majority of cases of seamen and other passengers bound to the United States the Canadian authorities regularly refuse permission to land in Canada unless admission to the United States is guaranteed by the United States Immigration Service.

The percentage of medical certificates issued was slightly higher than that of the preceding year. A fraction of over 1 per cent were deported or returned to Canada. Of the 37 so deported, 14 were for mandatorily excludable diseases. Notwithstanding that since last January the Plant Steamship Line withdrew their steamships from the service between this port and Boston, there has been a notable increase in the number of aliens of the border class, thereby counterbalancing somewhat the decrease in the trans-Atlantic class.

HIDALGO, TEX.

Acting Asst. Surg. W. P. Woodall reports that during the fiscal year ended June 30, 1917, 5,704 aliens were examined for the immigration authorities, and of this number 507 were debarred.

Chronic conjunctivitis was found to be the prevailing cause for certification.

It is believed the undue prevalence of this disease during the summer and autumn was due to gnats and midges which invaded both sides of the river and was coincident with the existence of the affection.

HONOLULU, HAWAII.

Surg. F. E. Trotter reports as follows:

A total of 4,552 immigrants was inspected at this port during the year ending June 30, 1917, and 329 were certified for diseases or disabilities in accordance with the immigration law. The majority of arriving aliens were Japanese, the remainder being Chinese and Koreans. The distribution of the medical certificates according to nationality was as follows: Japanese, 177 class A, 108 class B, and 20 class C; Chinese, 12 class A, 1 class B, and 0 class C; Koreans, 7 class A, 0 class B, and 0 class C; Russian, 0 class A, 1 class B, and 0 class C; Dutch, 1 class A, 0 class B, and 0 class C; Hindu, 0 class A, 1 class B, and 0 class C; Marshall Islander, 0 class A, 1 class B, and 0 class C. The largest of rejections was due to trachoma, and almost all of these were Japanese. The following are the districts from which aliens arrived from Japan who were found to be afflicted with trachoma, the figures in parenthesis representing the number of cases coming from the districts named: Kumamoto (37), Yamaguchi (34), Hiroshima (33), Fukuoka (20), Fukushima (11), Niigata (7), Okinawa (2), Wakayama (2), Toyama (1), Tokio (1), Fukui (1), Kanagawa (1).

During the year 4,467 aliens were examined for uncinariasis and 22 were found to be afflicted with this disease, of which 20 were Japanese coming from the following-named districts in Japan: Hiroshima (5), Yamaguchi (4), Kumamoto (4), Fukuoka (3), Okinawa (2), Niigata (1), Wakayama (1).

The number of aliens granted hospital treatment upon arrival here with a view to effecting a cure of the diseases and eventually permitting the cured aliens to land was a few more than during the previous year. Nearly all of those furnished treatment were afflicted with uncinariasis, it being the policy of the immigration authorities to permit the treatment of these cases almost without exception. The policy, however, does not apply to aliens afflicted with trachoma and other dangerous or loathsome contagious disease, such afflicted persons being deported as required by law.

During the year three fines of $100 each have been imposed against steamship companies for violations of the provisions of section nine of the immigration law.

Attendance at Queen's Hospital of aliens.—Three aliens were operated on at Queen's Hospital by medical officers of the service, while five aliens were treated in the hospital for various diseases.

Transactions.

Number of aliens pending at beginning of year	18
Number of aliens examined	4,552
Number of aliens passed	4,223
Number of aliens certified	329
Number of aliens deported	146

Number of aliens landed	186
Number of aliens pending at close of year	15
Number of meetings of the medical board	4
Number of examinations made for uncinariasis	4,467
Number of aliens found infected with uncinariasis	22
Number of aliens treated for other causes at station	40
Number of aliens treated at hospital	5
Number of operations performed	3
Number of fines imposed	3
Number of aliens treated for trachoma and discharged cured	21
Number of aliens treated for uncinariasis and discharged cured	22

Aliens inspected and certified at Honolulu, Hawaii, during the fiscal year, 1917.

	Aliens certified.					Important diseases for which certification was made.							
	Class A (1). Idiocy, imbecility, feeble-minded, epilepsy, insanity, tuberculosis.	Class A (2). Loathsome contagious or dangerous contagious.	Class B. Disease or defect which affects ability to earn living.	Class C. Disease or defect of less degree.	Total.	Trachoma.	Uncinariasis.	Trachoma and cataract.	Trachoma and corneal opacity.	Trachoma and pregnancy.	General paresis.	Gonorrhoea.	Beriberi.
Japanese		177	108	20	305	155	20	1	1	1			5
Chinese	1	11	1		13	9	1				1		
Korean		7			7	6	1						
Russian			1		1								
Dutch		1			1							1	
Hindu			1		1								
Marshal Islanders			1		1								
Total	1	196	112	20	329	170	22	1	1	1	1	1	5

HOULTON, ME.

Acting Asst. Surg. E. C. Bates reports as follows:

The work at this station this year has been on a decrease from previous year, but is still of the same nature, namely, passing upon the physical condition of aliens referred by the immigrant inspector.

The cases passed upon are nearly all persons living near the border and seeking admission to this country, and they are nearly all persons of sound and robust physical condition, being mostly farmers and laborers and their families. A total of 54 cases have been examined during the past fiscal year, 6 of whom were certified.

KETCHIKAN, ALASKA.

Acting Asst. Surg. H. C. Story reports as follows:

During the year 1,926 aliens were inspected, of which number 3 were certified.

LAREDO, TEX.

Surg. Edward Francis, in charge of the medical inspection of arriving aliens, reports as follows:

Forty-one thousand two hundred and eighty-four aliens were examined, which represents an increase of 10,924 over the previous year. Four hundred and thirty-nine certificates were issued.

In addition to the medical inspection of arriving aliens the medical officers rendered medical and surgical service to immigrants held in the detention quarters by the immigration service for illegal entry; many of these are detained for lengthy periods, and although some had minor ailments none became seriously ill.

All aliens were examined at the footbridge, since passenger traffic over the railroad bridge has been suspended during the year.

MARCUS, WASH.

Acting Asst. Surg. T. F. Parker reports as follows:

During the fiscal year ended June 30, 1917, there were examined 893 aliens, of which number 105 were certified, 40 being deported. As there are no detention facilities at this port, the deportable cases are returned to Canada on the day certified.

MOBILE (ALA.) QUARANTINE.

Asst. Surg. F. M. Faget reports that there were examined at the Mobile quarantine station 89 aliens who were applicants for landing in this country. Of this number 6 were certified and excluded and 83 landed.

MONTREAL, CANADA.

Surg. J. B. Stoner reports as follows:

During the fiscal year ended June 30, 1917, there were 12,545 aliens medically inspected at this station, as compared with 16,225 in the preceding year, and 20,092 during 1915.

On May 1, 1917, the inspection of Chinese aliens at Montreal for transit through the United States from Malone, N. Y., to New York

City, en route from China to Habana, Cuba, or other places in the West Indies, ceased automatically because the new Chinese regulation of the Department of Labor contained a provision that Chinese shall not be granted the privilege of transit across the United States to foreign countries elsewhere than at the designated seaports.

The illiteracy test and the $8 head tax also are operative, to an extent, in reducing the number of aliens applying for inspection; and the Canadian Government has taken steps to prevent the emigration of men of military age from Canada.

Aliens are presented for examination by an immigration official, who conducts them into the office of the medical officer and furnishes a blank medical certificate for each alien, or in the case of a family all names of same, as a rule, are included in the certificate.

These certificates are signed at the conclusion of the examination whether the alien is certified or found free from any physical or mental defect or disease.

The hours of duty are from 9 a. m. to 1 p. m. and from 2 p. m. to 5 p. m.

The facilities for examination are inadequate for the following reasons:

1. The room provided for the medical officer is too small when several persons are presented at one time for examination.

The room is not well lighted. Even on clear days the sunshine enters the room only for a short time. On cloudy days and always during the short days of the long winter months, between 4 and 5 o'clock, it is difficult to examine eyes and detect alterations in the structure of the skin and mucous membranes. There is a double window facing west, but daylight illumination is partly obstructed by a stone retaining wall extending to the upper edge of the window, and located at a distance of about 10 or 12 feet. The absorption of light is further augmented by the use of double windows during the winter months and from dirt and dust allowed to accumulate on the window panes.

The commissioner stated that he will provide ample artificial illumination for the medical officer's room. However, unless there is an abundance of light to insure a maximum diffusion and avoidance of objectionable glare, the artificial illumination will not be equivalent to daylight illumination, and poor light has been assigned as a factor in the production of eyestrain and shortsightedness.

2. The room is too noisy because of the proximity of the hallway and the occasional sounding of call-bells located in the hallway.

3. There is no place in which to make satisfactory microscopical examinations except the window sill. But in that position the microscope is placed too high for convenience and comfort.

There are two front rooms in the building with better daylight illumination, but these are occupied by the inspector in charge and the board of special inquiry.

An office building conveniently near the railroad stations was desired by the commissioner. This building was so located and was the most suitable one that could be rented.

Prior to 1913 aliens were not presented for medical inspection after 4 p. m. except in an emergency.

NACO, ARIZ.

For the fiscal year ending June 30, 1917, Acting Asst. Surg. B. C. Tarbell, stationed at this port, reports 7,063 aliens examined of whom 7,015 were passed and 48 debarred for mental or physical defects.

The increase of 2,175 aliens applying for admission at this port for the fiscal year just ended over the preceding one is partly due to the unsettled conditions existing in Mexico, and also to the fact of the high wages paid in this State to mining laborers.

During the past year the Southern Pacific Railroad Co. of Mexico has given very good train service into Naco, and all trains arrive and depart during the day, so that ample time is to be had for the medical examination of all arriving aliens.

NEW ORLEANS, LA.

Acting Asst. Surg. J. T. Scott reports as follows:

Subsequent to the declaration of war by the United States the internment of 200 aliens at the New Orleans Immigration Station greatly increased the work of the officers attached thereto. Nearly 200 men, women, and children had to be taken care of under adverse conditions, chiefly lack of proper equipment and sufficient living space. There was also a marine guard quartered in the main building for the purpose of guarding the interned aliens. The surgeon's office and operating room were converted into nurseries. The surroundings were sanitary except for this overcrowding in sleeping quarters, but there were no drugs and surgical dressings at the station, although attention had frequently been called to this deficiency on previous occasions. Consequently prescriptions had to be filled in drug stores in New Orleans. The sick were necessarily left in the care of a matron at night. There were no quarters for the medical officer and severe cases of illness had to be sent to the hospital at New Orleans for treatment, as there is no hospital equipment whatever at the immigration station. Fortunately, most of the detained aliens were in good health and tractable to instructions. Recently most of the aliens have been transferred to Hot Springs, N. C.

In addition to the interned aliens, there were quite a number of alien seamen and stowaways suffering from venereal diseases who were certified and sent to the immigration station for detention pending their deportation. On account of the limited quarters at the immigration station, it was very difficult to isolate these cases.

The administrative difficulties presented to the medical officer in the mental and physical examination of arriving aliens and subsequently rendering medical aid to those detained is increased by reason of the practice of holding inspections on vessels at the various places in the river, wherever they may dock, which at New Orleans means a river front of 12 miles distance to be covered. A daily trip to and inspection of detained aliens at the immigration station requires not less than two hours, and if this station is to be used for a detention barracks, some sort of hospital should be added and suitable quarters provided for the medical officer. At present the medical officer perforce has to live in the city across the river at a great distance from

the immigration station, and is not available in event of emergency. The immigration station is equipped with wharf leading to the main immigration building, but is not used for the examination of arriving aliens. The steamship companies continue to have their alien passengers inspected on board ship, where the space is necessarily cramped, and no adequate facilities for the conduct of the mental and physical examination are provided.

To add to the difficulties, some of the steamship companies make no distinction between cabin and steerage immigrants or nonimmigrant aliens, and very little assistance is given to the medical officer, he frequently being compelled to locate the passengers without any assistance from those on board ship or otherwise concerned.

The increased demand for labor in this country and the proportionately higher wages being paid has induced a large number of immigrants from the Tropics to come either as passengers, as work aways or stowaways. Many of them have been found to be physically unfit and have been deported. Quite a number of alien seamen feign illness or disability in order to escape the return journey through the war zone. As a result they are sent to the immigration station for medical examination. All told the number of aliens examined during the fiscal year was 5,018, of which number 185 were certified on account of disease or physical or mental defect. Of the number certified, 67 were of Class A, 66 of class B, and 52 of class C.

NEWPORT NEWS, VA.

Acting Asst. Surg. A. C. Jones reports as follows:

During the fiscal year ended June 30, 1917, the medical examination of aliens materially increased over that of the preceding year, but is chiefly confined to the examination of alien seamen. During the year there were examined 813 aliens at the request of the immigration inspector in charge. Of this number 15 were certified on account of physical or mental disease or defect.

NEW YORK, N. Y.

Senior Surg. J. C. Perry, in charge, reports as follows:

General.—The service work in connection with the medical inspection and care of immigrants at the port of New York during the year ended June 30, 1917, has been of the same general character as that performed in the preceding year with the exception that when the immigration law of February 5, 1917, became effective on May 1 it imposed additional duties by the requirement of the medical examination of all alien seamen.

The increased work due to the examination of alien seamen has necessitated the detail of an additional number of officers for duty in the boarding division, and some difficulty has been experienced in the satisfactory discharge of these added duties, on account of insufficient boarding facilities, but it is thought that with further prosecution of this work, and the adjustment of minor details, more satisfactory progress will be made with a resultant saving in the services of a number of medical officers. At present a large percentage of the

medical officers on duty at the station is required for inspection service in the boarding division.

The immigration during the year has been small, and since the entry of the United States into the war the number of alien passengers has dwindled. A few vessels from Scandinavian ports and an occasional one from the south of Europe furnish at times a busy day. However, on account of the number of patients detained in hospital, due to the impracticability of effecting deportation of aliens to various of the belligerant countries, and the increased amount of work due to the examination of alien crews, it has not been possible to materially reduce the number of medical officers. The total number of arriving aliens was 160,105, a still further decline from that of the preceding year. The percentage of certificates from all causes was practically the same, 3.25 per cent.

Careful attention has been paid to the examination of aliens for mental deficiency, but the number of certificates issued for this class is less than in the preceding year, being 91.8 per 100,000 as compared to 111 per 100,000 during the preceding year. This would seem to be due to the lessened number of immigrants from the southern European countries, among whom a proportionately higher percentage of mental deficiency has hitherto been noticed, and also to the fact that many of the aliens examined had previously resided in the United States and were returning after a more or less temporary sojourn in their native countries. The number of certificates issued for insanity corresponded fairly closely with the previous records at this station, and was in the proportion of 25.6 per 100,000.

Attention is invited to two certifiable disease conditions, namely, "physical signs of tuberculosis" and "constitutional inferiority." These terms formerly were used at this station as indicating conditions certifiable under class B diseases—i. e., affecting ability of self-maintenance. Under the term "constitutional inferiority" formerly were included some cases which more properly should be designated as "constitutional psychopathic inferiority." Within the year a change has been made in the immigration law, by which all cases previously certifiable as having unstable nervous system are now certified for "constitutional psychopathic inferiority," and all other cases which might have been included in this group are certified by the term "lack of physical development," or other term more specifically indicating the disease or defect. The certificate of "physical signs of tuberculosis" has been discontinued and a specific certificate of "tuberculosis" is issued when the physical signs or conditions are indicative of that disease, even though the tubercle bacillus is not found by microscopical examination. Such cases are held under observation for a sufficient length of time to enable the certifying physician to arrive at a satisfactory conclusion.

Hospitals.—The total number of patients receiving treatment in the hospitals during the year showed a marked decrease not only in the immigrant general hospital but also in the contagious-disease hospital, both due to lessened immigration, and in the case of the contagious-disease hospital, to the fact that the number of contagious diseases was considerably less, especially measles and scarlet fever. The number admitted to the immigrant general hospital

during the year was 3,316 and to the contagious-disease hospital, 1,214. Owing to the impracticability of deporting certain excludable aliens, on account of war conditions, a number of those suffering from trachoma and ringworm of the nails received operative treatment in the hospitals and were finally discharged as cured. Operations were performed on 23 cases of trachoma and on 39 cases of tinea unguium.

Laboratory.—The amount of work in the bacteriological laboratory has slightly exceeded that performed in the preceding year, especially in the number of Wassermann tests. In addition to routine work, some special studies on the meningococcus have been carried out, but it has not been possible to seriously prosecute any research work, as only one officer has been available for the detail and his time was entirely consumed in performing routine work.

The work accomplished is best shown in a tabulated statement:

Specimens of urine examined	333
Specimens of feces examined for hookworm and helminths or ova	33
Sputums examined for tubercle bacilli	450
Cultures from nose and throat examined for diphtheria bacilli	1,154
Smears from vagina examined for gonococcus	276
Smears from urethra examined for gonococcus	29
Examinations of specimens from nails, scalp, and skin for favus and ringworm	580
Examinations of nasal and other smears for leprosy	16
Number of agglutination tests for typhoid fever	13
Blood examinations (exclusive of Wassermann and other tests)	143
Specimens of spinal fluid examined and cultured for meningococcus, cell counts, globulin, etc	12
Autogenous vaccines prepared	8
Tissues sectioned and examined	4
Miscellaneous specimens examined	50
	3,101
Wassermann (Nogochi) reactions performed:	
For Immigration Service	1,151
Total positive or partially positive	396
Total negative	755
Total reexaminations (positive or partially positive)	277
For Marine Hospital (Stapleton) and Coast Guard Service	759
Total positive or partially positive	202
Total negative	557
Total reexaminations (positive or partially positive)	149
Total Wassermann reactions done	2,336
Total specimens of all kinds examined during the year	5,437

Anthropometric measurements.—During the year anthropometric measurements have been continued, but owing to the character of immigration and the limited number of specific types arriving, a material advancement in this work has not been accomplished. However, this work will be prosecuted and it is expected that eventually it will be possible to prepare some satisfactory tables.

During the year 45 visits have been made by officers to different institutions in the vicinity of New York for the purpose of examining the physical condition of aliens treated therein in order to determine whether the disease or defect was due to causes existing prior to landing and whether said aliens could be safely deported.

The general work accomplished during the year is herewith presented in tabular form:

Passengers arriving at New York from foreign ports.

Aliens in cabin	63,286	
Aliens in steerage	96,819	
Total aliens		160,105
Citizens (cabin)	32,406	
Citizens (steerage)	7,033	
Total citizens		39,439
Crew (month of June only)		16,028
Grand total, aliens, citizens, and crew		215,572

Medical certificates.

Class A (1), including 4 idiots, 19 imbeciles, 41 insane, 118 feeble-minded, 2 constitutional psychopathic inferiority, 6 epileptics, 49 aliens certified for tuberculosis, and 1 alien tuberculosis, glands of neck	240
Class A (2), loathsome contagious, or dangerous contagious disease	488
Class B, disease or defect which affects ability to earn a living	4,302
Class C, disease or defects of less degree	178

Disposition of immigrants certified.

Class A (1):	
Cases pending at beginning of year	52
Cases certified during year	240
Total to be accounted for	292
Cases deported	183
Cases landed	73
Cases pending close of year	36
Class A (2):	
Cases pending beginning of year	23
Cases certified during year	488
Total to be accounted for	511
Cases deported	333
Cases landed	150
Cases pending close of year	28
Class B:	
Cases pending beginning of year	38
Cases certified during year	4,302
Total to be accounted for	4,340
Cases deported	535
Cases landed	3,745
Cases pending close of year	60
Class C:	
Cases pending beginning of year	0
Cases certified during year	178
Total to be accounted for	178
Cases deported	7
Cases landed	171
Cases pending close of year	0

Disposition of cases certified during the fiscal year ending June 30, 1917, including cases pending from preceding fiscal year.

	From preceding year.	Certified.	Total.	Deported.	Landed.	Remaining.
Class A (1)	52	240	292	183	73	36
Class A (2)	23	488	511	333	150	28
Class B	38	4,302	4,340	535	3,745	60
Class C	0	178	178	7	171	0
Total	113	5,208	5,321	1,058	4,139	124

Report of alien seamen certified.

CLASS A (1).

Insane	2
Tuberculosis	5
Alcoholism, chronic	1
Total	8

CLASS A (2).

Tinia unguium	1
Syphilis	4
Gonnorrhea	23
Soft chancre	7
Trachoma	29
Total	64

CLASS B.

Malaria, chronic	1
Senility	3
Hernia	3
Weak abdominal walls	1
Positive Wassermann reaction	7
Valvular disease of heart	3
Organic disease of heart	1
Varix	2
Deformity of elbow	1
Stiff joint, hip	1
Loss part of fingers	1
Inflammation lymph glands of neck, chronic	1
Inflammation lymph glands of groin	1
Inflammation of ear	1
Emphysema	1
Deafness	1
Defective vision	2
Total	31

NOTE.—Members of crews are returned to their ships. In event permission to land is requested they are handled as alien passengers and are reported in the general list.

Medical and surgical report of diseases in the United States immigrant hospitals, New York, during the fiscal year ending June 30, 1917.

	From preceding year.	Admitted.	Total.	Recovered.	Improved.	Not improved.	Died.	Remaining.
Total immigrants	119	4,291	4,410	3,027	271	973	41	98
Interned German seamen	.....	239	239	184	34	7	1	13
Total	119	4,530	4,649	3,211	305	980	42	111

Causes of death in aliens.

Abscess, right parotid gland	1	Trachoma	1
Autointoxication, intestinal	1	Tuberculosis, chronic pulmonary	4
Convulsions	1	Typhoid fever	1
Diabetes mellitus	1	Whooping cough	1
Diphtheria	1	Morphine poisoning, chronic	1
Hemophilia	1	Fractured skull (simple)	1
Influenza	1	New growth, malignant	1
Insanity	2	Positive Wasserman reaction	1
Measles	7	Undiagnosed (persons accompanying aliens)	2
Bronchopneumonia	3		
Pneumonia, lobar	4	Total	42
Scarlet fever	5		
Senility	1		

Races of immigrants deported on medical certificates during fiscal year ending June 30, 1917.

Race.	Men.	Women.	Children.		
			Male.	Female.	Total.
African, black	49	13	1		63
Armenian	23		3	1	27
Assyrian	3	1	1		5
Albanese	12	1			13
Bulgarian	1				1
Brazilian	1				1
Cuban	3	1			4
Chilean	1				1
Chinese	10				10
Dalmatian	2				2
Dutch	5	1			6
English	9	6		1	16
Finnish	4	11			15
French	9	1			10
Greek	215	28	3	2	248
German	2		1		3
Hebrew	16	5			21
Indian	1				1
Irish	8	18		2	28
Italy, south	286	84	8	3	381
Japanese	1				1
Lithuanian	2	1	1		3
Magyar		2	2		4
Macedonian	5				5
Mexican		3			3
Maltese	3				3
Polish			1		1
Portuguese	19	1	1		21
Persian	2	1			3
Roumanian	1				1
Scandinavian	23	9	1	4	37
Spanish	79	4	2		85
Serbian	3				3
Syrian	19	3			22
Scotch	4		1		5
Turkish	4				4
Welsh	1				1
Total	826	193	26	13	1,058

Nativity and race of immigrants certified for trachoma during the fiscal year ending June 30, 1917.

Nativity.	African, black.	Albanian.	Armenian.	Assyrian.	Bulgarian.	Chinese.	Cuban.	Dalmatian.	English.	Finnish.	Flemish.	French.	Greek.	Hebrew.	Irish.	Lithuanian.	Maltese.	Polish.	Persian.	Portuguese.	Scandinavian.	Scottish.	Spanish.	South Italian.	Syrian.	Turkish.	Welsh.	Total.
Austria	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	3
Belgium	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
British	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	1
British West Indies	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
China	....	....	....	....	....	10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10
Cuba	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Colombia	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1
Denmark	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1
France	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Greece	....	....	....	....	1	....	....	....	....	....	....	....	78	1	....	....	....	....	....	....	....	....	....	....	....	....	....	80
Italy	....	1	....	....	....	....	....	....	....	....	....	....	1	....	....	....	6	....	....	....	....	....	....	63	....	....	....	65
Malta	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6
Norway	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	....	....	....	....	....	....	5
Persia	....	....	10	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	17
Portugal	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	2
Russia	....	....	....	....	....	....	....	....	....	9	....	....	....	15	....	1	....	....	....	....	....	....	....	....	....	....	....	25
Spain	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	19	....	....	....	....	19
Sweden	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	....	....	....	....	....	....	6
Switzerland	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Turkey	....	....	16	1	....	....	....	....	....	....	....	....	....	9	....	....	....	....	....	....	....	....	....	....	21	1	....	48
United Kingdom	....	....	....	....	....	....	....	....	2	....	....	....	....	....	6	....	....	....	....	....	....	1	....	....	....	....	....	9
Total	3	1	26	6	1	10	1	1	2	9	1	2	79	25	6	1	7	2	2	1	12	1	20	63	21	1	....	304

Race of aliens certified for mental condition during fiscal year ending June 30, 1917.

Race.	Insane	Feeble-minded.	Imbecile.	Idiot	Epilepsy.	Chronic alcoholism.	Constitutional psychopathic inferiority.	Total.
African, black	3	5			1			9
Armenian			2					2
English	6	2	3	1	1	1		14
French		2			1			3
Finnish					1			1
German	2	1						3
Greek	1	11	2		1			15
Hebrew	2	5	2		1			10
Irish	8	2	2					12
Italian, South	7	82	6	2				97
Italian, North								
Mexican		1						1
Portugal							1	1
Spanish	2	6	1					9
Scandinavian	6							6
Scotch	3			1				4
Servian			1					1
United States citizens	1						1	2
Ruthenian		1						1
Total	41	118	19	4	6	1	2	191

Summary of hospital transactions, fiscal year ending June 30, 1917.

Number of patients in hospital at beginning of year	119
Number of patients admitted to hospitals (immigrant, general, and contagious disease) during year [1]	4,530
Total treated (men, 2,518; women, 1,095; male children, 486; female children, 550)	4,649
Births (male, 1; female, 2)	3
Deaths (men, 14; women, 10; male children, 10; female children, 8)	42
Pay patients treated during year	4,371
Free patients treated during year	278
Number of days treatment, pay patients	47,248
Number of days treatment, free patients	6,349
Total number of days treatment for hospital cases	53,597
Maximum number of patients in hospital at any time during year	311
Daily average number of patients in hospital	146
Number of patients in hospital at end of year	111

Hospitals.	From previous year.	Admitted.	Total treated.	Recovered.	Improved.	Not improved.	Died.	Remaining.	Days treated.
Immigrant	82	3,316	3,398	2,213	277	789	23	96	46,700
Contagious	37	1,214	1,251	998	28	191	19	15	6,897
Total	119	4,530	4,649	3,211	305	980	42	111	53,597

NOGALES, ARIZ.

Acting Asst. Surg. A. L. Gustetter reports as follows:

During the past year three passenger trains weekly arrived from Guaymas, Mexico, and the same number of trains weekly arrived from Cananea, Mexico. During December, 1916, there were about 35 cases of smallpox reported in the hamlet of Ures, about 25 miles

[1] Included in total number of patients treated in hospital: Interned Germans, 239; United States soldiers on guard, 36.

southeast of Hermosillo, the capital of Sonora, Mexico. The Mexican authorities immediately proceeded to vaccinate all the inhabitants of Ures and practically isolated them from communication with any other parts of the State, and thus promptly eradicated the disease. There were no other epidemic diseases reported in Mexico south of Nogales. Much time has been spent by the Mexican authorities of the State of Sonora in endeavoring to clean up the State in a sanitary way, and they have accomplished good results along this line. As there was very little demand for labor in the State of Sonora, Mexico, many of this class sought work in the United States, and therefore there were a number of these who entered at this port. They were examined carefully, and, as a general rule, found to be in very good physical condition. Of 10,272 aliens examined, 110 were certified, 103 of this number for trachoma.

OROVILLE, WASH.

Acting Asst. Surg. Frank S. Beale reports that during the fiscal year 169 aliens were examined and 9 were certified.

PHILADELPHIA, PA.

Passed Asst. Surg. Louis Schwartz reports as follows:

Because of the war the regular lines of passenger carriers have ceased to call at this port, and there arrived during the year only 396 immigrants. These came on freight steamers, or tramps, and consisted usually of such members of the crew as desired to remain in the United States. Only one vessel brought regular passengers.

There were examined for discharge from foreign vessels 940 seamen up to May 1, 1917. Of these 4 were found to have chancroid, 7 to have syphilis, 7 gonorrhea, 1 bubo, and 3 trachoma. Since May 1 all the crews of vessels from foreign ports are examined at Reedy Island, and certificates issued to the immigration officer. Those certified are reexamined in Philadelphia by the medical officer in charge of the examination of arriving aliens, who countersigns the original certificate. There have been examined 8,860 seamen and 152 certificates issued. Of these 37 were for mandatory diseases. The class of sailors is lower physically than in times of peace, as a great many men who are unfit for military duty go to sea on merchant vessels, and those who were in the merchant service and fit for military duty have been drafted into the military and naval forces.

Since the entry of the United States into the war about 200 enemy aliens have been interned at the Gloucester Immigration Station. The medical officer in charge has treated such illnesses as have occurred amongst them, sick call being held every morning at 10 o'clock. There have been treated at the dispensary 324 patients, to whom relief was given 884 times. In addition to this, 230 vaccinations were done and 203 inoculated against typhoid fever.

At the request of their commanding officer the detachment of New Jersey National Guard on duty at the immigration station have been under the care of the medical officer in charge. They were all vaccinated and inoculated against typhoid fever and medical relief was given to all who reported sick.

A hospital building is urgently needed at this station, especially for the care of alien seamen certified in accordance with the provisions of the new immigration law.

IMMIGRANT MEDICAL INSPECTION IN THE PHILIPPINE ISLANDS.

The examination in the Philippine Islands of arriving aliens is made by the officers of the Public Health Service who are detailed as quarantine officers and perform the duties of immigrant medical inspectors in addition to their quarantine duties. The examinations are made on board arriving vessels, in the quarantine and immigration offices and at the immigration detention stations. The immigration laws of the United States are in force in the Philippine Islands and the methods in force are the same as those used in continental United States.

In conducting this work there were 6,223 aliens inspected with 26 certified for rejection.

The arrivals by ports were as follows: Manila, 4,536; Iloilo, 273; Cebu, 47; Jolo, 361; Zamboanga, 643.

The certificates of rejection were issued for the following diseases: Trachoma, 21; uncinariasis (hookworm), 3; and favus, 2.

In carrying out the medical inspection of arriving aliens there were 2,123 examinations made to determine the presence or absence of hookworm; of these 25 were positive; and in the majority of cases permission for treatment was obtained from the immigration officers, and in time all cases were reported negative, no deportations having resulted by reason of hookworm infection.

As heretofore, trachoma proved to be the cause for which the greatest number of certifications were necessary.

There has been an increase in the number of alien immigrants arriving in the Philippines during the past year, and the year previous also showed an increase over the preceding year. The first six months of 1917 shows a still larger increase of arrivals.

The nationalities represented by the said alien arrivals were classed as follows for the last three calendar years.

Peoples.	1914	1915	1916
Chinese	2,383	2,823	2,703
Dutch and Flemish	4	10	17
East Indian	61	60	46
English	134	101	122
French	23	6	21
German	83	17	7
Irish	7	2	3
Italian	8	8	6
Japanese	1,029	744	1,374
Portuguese	7	11	21
Russian	26	25	20
Scandinavian	3	5	4
Scotch	24	16	7
Spanish	207	204	252
Syrian	2	6	4
Turkish	5	1	2
Other peoples	26	28	32
Total	4,032	4,067	4,641

PORTAL, N. DAK.

Acting Asst. Surg. A. J. Somers reports that during the fiscal year 3,073 aliens were accorded medical examination, of which number 203 were certified as being mentally or physically defective. Of this number 53 were debarred.

This shows an increase of 2,179 as compared with the number examined during the previous year, the number of certifications also having increased practically 2 per cent. During the past year, an increase in the number of immigrant inspectors at this port has made it possible to detain more aliens for medical examination. The examination is as thorough as circumstances will permit, but owing to the lack of proper facilities and equipment, as well as time, it is not possible to make the examination of each individual as thorough and complete as at larger ports where conditions are more favorable.

There has been practically no European immigration through this port for the year last past, due, no doubt, to the unsettled conditions.

PORT ARTHUR, TEX.

Acting Asst. Surg. W. S. Winter reports as follows:

Aliens arriving at Port Arthur, Sabine, Sabine Pass, Beaumont, Port Neches, and Orange, Tex., are examined for the purposes of the United States immigration law by the Public Health Service officer stationed at Port Arthur, Tex. During the fiscal year ended June 30, 1917, there were 3,058 aliens examined, of which number 219 were certified for disease or physical disability. Subsequent to the enforcement of the act of February 5, 1917, the medical examination of aliens has included the mental and physical examination of alien crews. As a general rule, the examinations are performed at the various-mentioned ports, the United States immigration inspector in charge proceeding to those ports from Port Arthur for the purpose of conducting the examinations. During the coming fiscal year it is expected that the examination of alien crews will increase to the extent of several thousand examinations, as the shipping in the neighborhood of Port Arthur has increased on account of the oil industry.

During the year there were certified 62 aliens with gonorrhea, 40 with syphilis, 4 insane, 9 with tuberculosis, and 8 with trachoma. The other conditions noted and certified were of a less serious nature, and chiefly those conditions affecting ability to earn a living.

PORT HURON, MICH.

Acting Asst. Surg. George M. Kesl reports as follows:

During the year ending June 30, 1917, 3,717 aliens were examined by the medical officer in charge, of whom 614 were certified for mental or physical defect or disease. During the year 192 aliens who had been certified were returned to Canada.

The character of the immigration at this port has materially changed during the past year, inasmuch as 90 per cent of those examined were of Canadian nativity. This accounts for the general character of medical certifications and for the notable decrease in the number of cases of trachoma certified.

The duties of the acting assistant surgeon at this port include the examination of arriving aliens, aliens detained on warrant, aliens who have entered the United States without proper inspection, and the medical care of all detained aliens.

In addition to the regular duties required of the medical officer in connection with the United States Immigration Service, the medical officer examined 45 applicants for commissions in the Officers' Reserve Corps, United States Army. This service was performed voluntarily and gratuitously in order to aid the local committee in charge of this work at Port Huron.

PROVIDENCE, R. I.

Surg. D. E. Robinson reports as follows:

The number of immigrants arriving at this port during the fiscal year was 18 per cent greater than for 1916, notwithstanding the operation of conditions which have tended to a marked decrease in immigration in general. This is accounted for largely by the fact that immigrants for this port are drawn from those countries least affected by the war (Portugal and Azores) and the lessened dangers of trans-Atlantic travel from those countries as compared with other parts of Europe. Although the number has increased over the previous year, the physical standard was lower. The total number inspected was 5,296, of whom 369 were certified for disease or defect, physical or mental.

RIOGRANDE, TEX.

Acting Asst. Surg. J. H. Hunter reports as follows:

During the early part of the fiscal year service transactions were performed in tents provided for that purpose, but during the latter part of the year the work has been conducted in a new building recently erected by the department for quarantine purposes. The plant is substantial, neat in appearance, and is situated on a United States Government reservation at Fort Ringgold, which adjoins the town of Riogrande, and is located at the ferry landing. The building has three rooms, one of which is shared jointly with the immigration inspector. Since the establishment of the station there appears to be a decrease in the number of contagious diseases on the Mexican side of the border, and the improvement in the cleanliness of the Mexican people is marked.

SAN FRANCISCO, CAL.

Surg. W. C. Billings reports as follows:

The fiscal year 1917 shows a decrease, compared with last year, of approximately 20 per cent in the total number of immigrants inspected at this station and a proportionate decrease in the number of aliens brought from the vessels upon which they arrived to Angel Island for further examination. No particular reasons are known for this decrease other than those which at the present time are everywhere limiting ocean travel.

Twelve thousand three hundred and thirty-five aliens were examined during the year and of this number 6,311 were referred to the hospital for more thorough examination than is possible on shipboard. Of the latter number 910 were certified to the immigration

authorities as presenting some condition falling within the various medical provisions of the immigration law. Eight of these 910 were class A (1) (mental or tuberculous), 617 were class A (2) (dangerous or loathsome contagious disease), 64 were class B (affecting ability to earn a living) and the remainder were such medical conditions as fall within the province of the class C certificate.

The only two departures of importance from the routine of the last preceding year were certain changes in the handling of second cabin passengers, and the ruling of the bureau that clonorchiasis, paragonimiasis, and schistosomiasis should be considered as class A (2) diseases.

Trachoma continues to present itself in approximately the same percentage as in the few last years and it seems unnecessarily unfortunate that this should be so. Effort is continually made by the medical division of this station to establish a definite understanding as to what conjunctival conditions are considered here as constituting trachoma, and the medical officers attached to this division are always ready to demonstrate these conditions clinically to the surgeons of the various trans-Pacific ships if they care to avail themselves of the opportunity offered, but nevertheless trachoma continues to arrive and necessitates the imposition of a section 9 fine.

Concerning uncinariasis and the methods in operation to limit its introduction, nothing can be added to what was said in the annual report of 1916. There were over 500 cases of this condition detected at this station this year.

The hospital still remains unprovided with any isolation facilities for defense against contagious disease, notwithstanding the fact that such diseases frequently appear—ranging from mumps to diseases of the greatest import—this year the latter type being represented by two cases of smallpox.

The work of the medical division has run smoothly during the year and desire for cooperation by both services interested has at all times been manifested.

Hospital report.

In hospital July 1, 1916.	Admitted during year.	Total in hospital during year.	Recovered.	Improved.	Not improved.	Died.	In hospital on June 30, 1917.
30	1,209	1,239	1,027	79	100	[1]1	32

[1] Died from tuberculosis.

SEATTLE, WASH.

Acting Asst. Surg. F. R. Underwood reports as follows:

During the fiscal year 1917 there was a marked increase in the number of aliens inspected, there being 6,268 during the past fiscal year as compared with 4,833 in the preceding one. From September 16 to March 17 the inspection of aliens for immigration purposes was performed at the Port Townsend quarantine station, as during that period incoming vessels from the Orient were detained for quarantine purposes. During the year the routine examination of all steerage

passengers for uncinariasis was inaugurated, with the result of a material increase in the number of certificates issued for this condition, and it would appear that a thorough examination at the port of embarkation is not being enforced. The number of aliens presenting evidences of uncinariasis was approximately 6 per cent of all those entering. The facilities at the immigration station for the detention and examination of aliens, however, are very much restricted, and when an unusually large number of immigrants arrive a number of them are forced to sleep on the floors, and the crowding results in a very insanitary and uncomfortable condition of affairs.

TAKOMA, WASH.

Acting Asst. Surg. F. J. Schug reports that 122 aliens were inspected, 3 being certified.

VICTORIA, BRITISH COLUMBIA.

Acting Asst. Surg. C. Denton Holmes reports as follows:

Presumably on account of war conditions, the lower type of aliens have been reduced in number, and the class of aliens passing through the immigration station have been of a superior kind and fairly well to do. Consequently there has been a decrease in the number of certifiable conditions. Of the 4,091 immigrants inspected 74 were certified on account of disease or physical or mental defect.

WINNIPEG, MANITOBA.

Acting Asst. Surg. C. Y. Douglass reports as follows:

During the year there were inspected 10,984 immigrants, of which number 1,436 were certified on account of disease or mental or physical defect.

The medical work at this station is rapidly growing in importance, the number of immigrants certified being practically double that of the preceding year and four times that of the fiscal year 1915.

Those who entered the United States seeking permanent homes were mostly of the agricultural class and of European origin, who, for some reason, had found Canada not to their liking. Large numbers of Ruthenians and Poles emigrated during the winter months. Such settlers were generally healthy, yet furnished many certifications for various deformities and most of those for pregnancy. Some, after a few years of the hardships of homesteading, were seeking less rigorous conditions, more or less diseased in mind or body. The proportion of mentally diseased attempting to pass through appears to be increasing. Many others are noted as being exceedingly peculiar, but with present facilities, actual defects of mentality can not be certified to in such cases.

Of those wishing to enter for a temporary sojourn, one group requires much attention of the medical examiner. It consists of those suffering from major and minor illnesses, and anxious to take treatment at hospitals in the United States under the supervision of famous specialists. This group accounted for about 60 per cent of the 1,436 certifications at this station. Each of these cases was given as thorough an examination as conditions would permit, in order to

determine the nature of the disease, its classification, and the likelihood of permanent disability resulting, and this information was embodied in each certification for the consideration of the board of special inquiry, who then determined the admissibility of the case. Of those going for treatment afflicted with debarrable diseases, 24 were admitted temporarily under bond.

Owing to the fact that Canada has recently enacted a law forbidding the emigration of males between 18 and 45 years of age, it is probable that the number examined this next fiscal year will be less, but the number of certifications may be expected to show a still further increase, as American hospitals are becoming better known and more popular in central Canada each year.

The quarters occupied by the immigration service are wholly inadequate. Aliens are often kept waiting for several hours and in some cases for two or three days before their cases are finally determined, and they are forced to sit for hours in a small room without proper ventilation, all classes mixed in together. The data clerks are compelled to work in this atmosphere daily.

The room set apart for the medical examiner is light and suitable for the purpose, but is furnished only with an old dilapidated couch and a desk. No provision is made for running water, which is almost a sanitary necessity. It is to be hoped the department will in the near future see its way clear to provide an examining table and a small laboratory to cost, perhaps, $500 or $600.

DOMESTIC (INTERSTATE) QUARANTINE.

During the early part of the fiscal year the extensive poliomyelitis outbreak at New York City and in other portions of the United States necessitated the detail of a large number of officers to infected districts in an endeavor to limit the interstate spread of the disease. The operations for the suppression of plague at New Orleans have been continued with encouraging results, and the infection gives every indication of being reduced to the point where it can no longer be considered a serious menace. The reentrance of plague into San Francisco County is to be noted. The work of suppressing the disease among ground squirrels in various parts of California, in order to prevent infection of urban communities, and the antiplague measures at Seattle have been continued. Efforts toward the prevention of the spread of Rocky Mountain spotted fever in interstate traffic have been conducted as heretofore, but at the termination of the fiscal year the eradication and control of the focus of the disease in the Bitter Root Valley were transferred to the State authorities. Certain revisions of the interstate quarantine regulations have been effected, and the revised as well as the preexisting regulations have been enforced, while numerous special investigations of water supplies, the sanitary condition of public buildings, and other problems have been undertaken. The work of the various interstate sanitary districts has been considerably broadened, and additional laboratory facilities have been provided for the conduct of the necessary operations.

MEASURES FOR THE CONTROL OF THE INTERSTATE SPREAD OF POLIOMYELITIS AT NEW YORK CITY.

The summer of 1916 witnessed an outbreak of poliomyelitis (infantile paralysis) of unprecedented proportions in various sections of the United States. Beginning early in June in the congested districts of the city of New York, the wave of infection rapidly extended for a hundred miles in every direction, and finally touched even far distant sections, invading in its passage across the country more than 30 States. The crest of the wave was reached early in August, after which time the disease slowly subsided, but it was not until late autumn or early winter that the epidemic could be regarded as quiescent and a normal incidence of the disease again obtained. The number of cases actually recorded from the inception of the outbreak until its close was more than 27,000, nearly half of which developed in New York City alone, and if unreported and unrecognized

cases are included it is believed that the actual total was not far from 35,000.

From the very onset of the epidemic a feeling of apprehension, if not of actual alarm, prevailed throughout the country, even in communities altogether remote from the centers of infection. The affection was rightfully regarded as mysterious in its nature and origin, more or less permanently disabling in its effects, if not actually fatal, and in large measure not responsive to the ordinary procedures enforced for the suppression of communicable diseases. In view of these facts it is not surprising that almost from the inception of the outbreak radical, and at times impractical, procedures should have been demanded by the public to prevent the introduction and dissemination of the disease, and that individual communities should have attempted to afford protection to their citizens in every possible manner.

The methods adopted to accomplish this purpose for the most part took the form of quarantine restrictions promulgated and established by local, city, and State authorities. These restrictions were necessarily widely variant in their character, lacking in uniformity and frequently conceived without regard to the principles governing disease control, although the result of entirely honest efforts. Many of the restrictions were absolute in their prohibitions, debarring not only those afflicted with poliomyelitis from entering a given district, but also healthy adults and children coming from infected zones, and even those who were merely in transit through such areas. In 71 communities in a single State alone, children from New York City were debarred from detraining, while in other States the regulations were no less stringent. Radical and unusual methods were adopted for the enforcement of quarantine measures. Guards were employed at terminals and bridges, highways were patrolled, and certificates of examination from physicians and city authorities were demanded. In other instances the quarantine restrictions were comparatively mild and consisted of medical inspection, the determination of the fact that the premises occupied were not infected with the disease, and the registration of the destination address, followed if necessary by the enforcement of quarantine for a varying period. Not only were these restrictions enforced by communities in immediate and direct communication by rail or boat with infected localities but they were likewise established and enforced by towns and cities altogether remote from infected areas and frequently extended the entire length of State boundaries.

The results of these unsystematized efforts toward the control of the disease were almost immediately apparent. Travelers were subjected to great personal inconvenience and at times to actual hardship. Cases were recorded of families with children journeying several hundred miles only to find upon completion of their journey that they would not be permitted to take up their residence in the city to which they were destined on the ground that they might have been exposed to infection or came from a locality where the disease was supposed to prevail. In many instances injustice was done and people were debarred from communities without good or sufficient reasons, while occasionally almost inhuman treatment was complained of, as for example the ejection of persons from hotels and trains. Owing to the wide diversity of the regulations promul-

gated by separate communities common carriers and transportation lines found it difficult or impossible to comply with the different requirements affecting passengers and were often put to considerable inconvenience, so that complaints from this source were common. The normal exodus of the summer season was heightened during the early days of the epidemic through the determination of parents to send their children out of infected areas into districts where the disease did not prevail. This but added to the confusion and was doubtless largely responsible for the further extension of the infection.

As the epidemic increased in magnitude and gave evidence of wider dissemination it became apparent, early in July, that Federal action for the relief of existing conditions and for the prevention of the interstate spread of the disease would become necessary. Under the act of February 15, 1893, authority of law was ample and could be invoked at any time for the enforcement of justifiable measures looking to this end, but unfortunately funds for this purpose were limited in amount, the appropriation for the prevention of the interstate spread of disease being limited to $15,000 annually, and officers for carrying into effect the measures contemplated were not available. In spite of these deterrent factors it was decided that remediable measures were necessary. Fortunately, Congress on August 7, 1916, following the establishment of the notification system, came to the relief of the situation by making an additional appropriation of $85,000 for cooperative effort in the control of the interstate spread of contagious and infectious diseases, bringing the amount available for this purpose to $100,000. At the same time an expenditure of $50,000 was authorized for additional assistant surgeons.

In a review of the situation before determining what measures were applicable for the control of poliomyelitis under the interstate quarantine law certain facts concerning the epidemiology of this disease, as considered from others of an infectious character, were necessarily borne in mind. As these facts had an important bearing upon the measures adopted their enumeration is necessary.

It was recognized that poliomyelitis is in all probability disseminated by personal contact, either direct or indirect, and that the infection is doubtless due to a specific virus present in certain secretions of those afflicted. In addition it was accepted that the active agent was frequently present in the secretions of convalescents, of healthy carriers, and of those who had suffered atypical and often unsuspected forms of the disease. It was further recognized that no practical or workable means for determining or identifying these carriers were at hand; neither was it possible to establish the identity of those who had suffered from mild and atypical attacks; therefore it was considered inevitable that these classes were bound to serve, irrespective of whatever quarantine or restrictive measures were adopted, as reservoirs of infection. From the history of past epidemics it was known that an incidence of two or three cases of poliomyelitis per thousand population constituted an epidemic, and that when this degree of prevalence was attained the disease frequently subsided without visibly affecting the remaining portion of the population. For this reason it was deemed impractible, even in the worst infected districts, to limit the movements of the large uninfected

class. The fact that the disease occurred principally in children, 90 per cent of all recognizable cases developing in those under 15 years of age, constituted sufficient and justifiable reason for concentrating all regulations upon this particular element of the population without regard to the feasibility of controlling the movements of adults, although it may be stated in passing that the impracticability of this latter plan, so strongly demanded at certain stages of the epidemic by those who were of the opinion that the infection was being disseminated by adults, was early apparent. All of these factors necessarily bore an important relation to the plans finally put into effect.

On July 5, 1916, the Board of Health of the City of New York passed a resolution declaring that great and imminent peril existed to the public health by reason of the outbreak of poliomyelitis and the following day the Secretary of the Treasury proffered the services of the Public Health Service in the suppression of the epidemic. This offer was almost immediately accepted. It was decided that the work of cooperation, so far as it related to the Public Health Service, should be carried on under two distinct divisions, the first to concern itself with epidemiological and scientific investigations and the second to measures for the prevention of the interstate spread of the disease. On July 13 Senior Surg. Charles E. Banks was summoned to Washington for a conference relative to the situation and subsequent to arrival was detailed as chief of the party which should undertake this latter phase of the work, with instructions to proceed to New York City immediately.

Upon arrival in New York City the morning of July 15 Senior Surg. Banks made a careful survey of the situation relative to the measures of safeguarding other States. Coincident with this, the cooperation of the various railroad and steamboat systems radiating from the city was sought and secured and their obligation as common carriers under the act of February 15, 1893, as detailed in the Interstate Quarantine Regulations, was set forth. It was ascertained that the Health Commissioner of New York City had already, namely on July 14, put into effect a plan of issuing health certificates to residents who desired to travel and who were accompanied by children under 16 years of age, and that this plan had proved of value to other communities. The cooperation of the Health Commissioner in the extension of this system was requested and assured. The plan outlined following conferences with the Health Commissioner of New York concerning every aspect of the local situation was as follows:

First. It was determined that all children 16 years of age and under should constitute a registered class of travel, and that whenever such children were destined by rail, boat, or other means of conveyance to points outside of New York City the parent or guardian should first secure a certificate stating that the premises occupied were and had been free from poliomyelitis, this certificate to be obtained from the board of health within 24 hours of the time of entraining or embarking.

Second. Medical inspection of outgoing travel was to be maintained at every avenue of exit from New York City, exclusive of a few trolley lines, and automobile traffic was to be similarly supervised by the same means, with the exception of a few roads at the

northerly point of the borough. The examination of outgoing travel was to consist of as careful and accurate inspection of each child as the rapidity of movement and exigencies of the situation permitted.

Third. As a part of the system of registration of travel, railroad and steamboat lines were to be required under the interstate quarantine law to refuse passage to all children under 16 years of age leaving New York City whenever the traveler was not provided with a certificate of identification issued by officers of the Public Health Service, this certificate to be given only when the applicant presented evidence from the board of health that poliomyelitis had not recently occurred on the premises from which he came. This procedure was to constitute the only quarantine measure imposed, and was only to apply to individuals actually coming from premises where poliomyelitis had occured. Adults were free to come and go without registration or certification.

Fourth. Supplementing the above procedures, a notification card, accomplished by a Public Health Service officer, was to be immediately mailed to the health officer of the locality to which the passenger was destined, informing him of the expected arrival of the persons mentioned, and giving the future street and house address in the town or city to which the traveler was bound. It was contemplated that the receipt of this card would enable the local health authorities to adopt whatever measures were warranted, such as registration and daily observation, and entirely obviate the necessity of maintaining inspectors at railroad terminals and other points of ingress. At the same time the system of notification would tend to standardize the methods adopted by local quarantine officers of other States, through cooperation with the plan of registration, and eliminate harsh restrictive measures which had been enforced owing to lack of knowledge of the extent of the epidemic or absence of information of the origin of travel into the community. It is apparent that these measures were not in any sense a quarantine restriction, but essentially a frank inspection and notification system to health officers of travel to their localities from New York City, established for the purpose of enabling those officers to adopt such supplemental measures as were deemed necessary to meet the problem of contagion. A quarantine of the children of New York City was considered wholly impracticable and, under the existing circumstances, inadvisable, but it was hoped that the system as adopted would have the effect of lessening outgoing travel and entirely prevent children from infected families leaving for other localities.

The plan as outlined having been adopted, the system of notification was inaugurated on July 18. Offices had previously been opened in room 425, Post Office Building, and a force of clerks, stenographers, and employees had been secured and were assigned to duty at each avenue of outgoing travel for the purpose of facilitating the issuance of notification cards. The following officers were directed to proceed to New York city and report to Senior Surg. Charles E. Banks for duty in connection with outgoing medical inspection and to exercise supervision over other control measures: Senior Surg. P. C. Kalloch; Surgs. W. J. Pettus, J. B. Stoner, B. W. Brown, C. H. Gardner, J. H. Oakley, M. H. Foster, L. D. Fricks, and D. E. Robinson; Passed Asst. Surgs. R. A. Herring, J. R. Hurley, R. A. Kearney, George Parcher, L. Schwartz, and R. H. Hetrick; Asst. Surgs.

Liston Paine, M. V. Safford, J. B. Laughlin, L. O. Weldon, W. M. Jones, O. H. Cox, M. S. Lombard, T. E. Hughes, L. L. Williams, and R. R. Ivey; Acting Asst. Surgs. George T. Tyler, Archibald W. Graham, Maxwell Branner, Arthur F. Jackle, Edward B. Beasley, Howard James, George B. Pace, John C. Hughes, Philip Lehman, Henry W. Brown, Frank S. Pike, Joseph C. De Vries, and Morris Auslander; and Pharmacist R. D. Kinsey.

As rapidly as officers became available the work of certification, which upon inauguration of the system was only applied at the more important terminals and ferries, was extended to every known point of exit from the city, including automobile travel, and ultimately complements of officers were detailed to the following stations: Battery Park Landing, Liberty Street Ferry, Cortland Street Ferry, Hudson Terminal, Barclay Street Ferry, Chambers Street Ferries, Christopher Street Ferries, West Twenty-third Street Hudson and Manhattan Terminal, West Forty-second Street Ferries, West One Hundred and Thirtieth Street (Fort Lee) Ferry, Pennsylvania Railroad Terminal, Grand Central Depot, including the New York Central & Hudson River Railroad and the New York, New Haven & Hartford Terminals, the Fall River Line (steamers), the Colonial Lines (steamers), the New Bedford Line (steamers), East Side boats, New Orleans and Savannah steamers, Boston and Maine boats, and the Staten Island Ferries, guarding the entrance to points in New Jersey via Staten Island.

An integral and essential part of the notification system was the furnishing of information in the form of certificates by the New York City health department of freedom from poliomyelitis of the premises from which the applicant came. This information was based upon the accurate records of the health department, and without data of this character the value of the notification system would have been materially lessened. In its work of certification the city board of health rejected more than 500 applicants for certificates on the ground that the premises were not free from poliomyelitis and those who dwelt on infected premises or came from households where the disease prevailed and were kept from applying for certificates necessarily must have been several times this number, so that the value of the system in the prevention of travel by this class of persons was unquestioned.

In the issuance of the certificates in question it was at first required that the applicant should bring the child or children intending to travel to the offices of the board of health for medical inspection, but as this practice resulted in the mingling of those from infected and uninfected districts, with more or less promiscuity and consequent danger of the dissemination of the disease by contact, it was abandoned following a conference with the Commissioner of Health, and medical inspection at the time of departure from the city substituted therefor. In those cases where children were found actually ill at the time of departure they were debarred from entraining, in spite of the fact that they held certificates, and were returned to their homes.

Upon arrival of the traveler at the station or ferry the certificate of the city board of health was presented to the officer on duty, who ascertained that the person applying was the one named in the cer-

tificate, that the document was dated within 24 hours of the time of departure, and that the child was apparently in good physical condition. If all of these requirements were satisfied the service identification card was issued to the traveler, and simultaneously with the issuance of this card the duplicate thereof was immediately mailed to the health officer of the city or town to which the passenger was destined.

It was to be expected that in the limited time at the disposal of travelers, the haste to board trains, and the difficulties encountered from those unable to make themselves comprehended, that errors in obtaining addresses would occur, but these were exceptionally rare, and it can be safely asserted that during the time the system was in operation in practically every instance health officers were promptly notified of arrivals from the infected city.

The Public Health Service did not at any time purport to guarantee safe entry into the place of destination, and it was made clear to all travelers that the local authorities had complete power to raise whatever barriers seemed necessary for the protection of their communities. It was also made plain that the service exercised no jurisdiction over intrastate traffic. The notification cards as received by the health officer at the point of destination merely guaranteed that the traveler came from uninfected premises and was apparently well at the time of departure from the city.

During the early days of the epidemic the notification cards were forwarded directly to the local health authorities. Subsequently, at the special conference of State and Territorial health officers with the Public Health Service for the consideration of the prevention of the spread of poliomyelitis, it was suggested that in dealing with communities of less than 10,000 population, many of which were without boards of health or other organizations capable of handling the situation, that the original cards be forwarded to the State board of health for official record and whatever further action appeared desirable, and that the duplicates thereof be sent to the local authorities. This recommendation met with the official indorsement of the conference. Thereafter the modified procedure was followed. Inasmuch as a number of States required that all newcomers make their presence known to the health authorities immediately after arrival the system served as a double check upon persons of this class originating in New York City.

The notification card used corresponded to the following form:

Passengers leaving New York city for other States and accompanied by children under 15 years of age will please fill out this card.

NEW YORK, _____, 1916.

To the Health Officer at point of destination:

The person named below left New York to-day.

Name _____

Point of destination _____

Local address at point of destination _____

Number of children under 15 years of age accompanying _____

This information is furnished you on account of the present outbreak of poliomyelitis (infantile paralysis) in New York City.

Respectfully,

RUPERT BLUE,
Surgeon General, U. S. Public Health Service.

(Side of card for the address.)

Treasury Department,
Bureau of the
Public Health Service,
Washington.

Official business.
Penalty for private
use to avoid payment
of postage, $300.

Return after five days.

To the HEALTH OFFICER,

In those instances where travelers were unwilling or unable to give their local address at the point of destination, they were informed that notification cards would be withheld pending final decision in the matter. As a result of this action local health officers encountered but little difficulty in locating those arriving from New York City.

An embarrassing complication in the supervision of travel which it was necessary to overcome related to commuters having employment in the stores, shops, and factories of the city but living in Connecticut or New Jersey. Many persons of this class were under 16 years of age and daily traveled to their homes outside the city. Travelers of this class were cared for by the issuance of commuters' identification cards, secured in the ordinary manner and based upon information of the same character as that furnished by other persons, with the provision that the cards should be recognized as valid for a period of one week from the date of issue.

The handling of week-end excursionists destined to the beaches and other resorts also proved to be somewhat of a problem. This class of travel was both intrastate and interstate and was largely composed of children from infected as well as uninfected districts, so that it offered an excellent opportunity for the dissemination of the infection. After careful consideration the conclusion was reached that every attempt should be made to discourage this element of travel, and accordingly the certification of outgoing traffic of this character, so far as it could be determined, was refused. Baby parades at near-by New Jersey resorts and similar unnecessary gatherings of children at fairs and festivals were effectively controlled through notification of the respective managers of these affairs that restrictive measures would be applied in so far as the participation of children was concerned. It is believed that this attitude met with the hearty approval and support of the public in general.

It was expected that some difficulty would be encountered in handling travel in transit through New York City, but not originating therein, although fortunately but little trouble arose in this regard. The fear of the disease naturally led large numbers of those with children to select other routes of travel, so that the amount of traffic was considerably reduced, while the publicity given the epidemic and the almost universal requirement regarding certificates compelled others to obtain documentary proof of their place of origin. Under the conditions following the subsidence of the epidemic there was some relaxation on the part of local authorities at other places than New York City in issuing these certificates; this inevitably led to some confusion and made it necessary to secure other means of determining the place of departure. Officers were accordingly instructed to act upon such evidence as the possession of

through tickets, baggage checks and other confirmatory data, and to accord due credence for statements made in connection therewith.

From the date of the inauguration of the notification system, July 18, 1917, until October 2, 1917, when it was terminated, registration cards for 85,242 children were forwarded to health officers of the United States and foreign countries and slightly more than that number were medically inspected. On an average 1,122 children were daily certified for travel out of New York City. The largest number certified on any one day was 2,088 on August 5, at the height of the epidemic, and the next largest number was 2,061 on September 2. From the beginning it was found that many adults were requesting and even demanding certification, having come from uninfected localities, and in order to accommodate these persons certificates for adults were also issued, so that a total of 22,647 persons certified should be added to the amount of work necessitated by this inspection. The following table indicates by weeks the number of children and adults certified and the localities to which they were destined:

Period.	Children certified.	Adults certified.	Localities.	States
July 18–July 29	13,450	3,565	593	44
July 29–Aug. 4	8,723	5,749	864	37
Aug. 4–Aug. 11	9,068	4,937	1,120	38
Aug. 11–Aug. 18	6,982	1,891	1,136	43
Aug. 18–Aug. 25	5,425	1,359	958	43
Aug. 25–Sept. 1	5,674	1,227	934	43
Sept. 1–Sept. 8	7,826	1,277	851	40
Sept. 8–Sept. 15	6,430	899	821	42
Sept. 15–Sept. 22	8,209	946	777	40
Sept. 22–Oct. 2	13,455	797	685	40
Total	85,242	22,647	8,739	.....

Arranged by States and allowing for duplications, the localities were as follows:

State.	Localities.	State.	Localities.
Alabama	14	North Dakota	6
Arizona	11	Ohio	101
Arkansas	9	Oklahoma	15
California	34	Oregon	14
Colorado	10	Pennsylvania	333
Connecticut	326	Rhode Island	79
Delaware	35	South Carolina	29
District of Columbia	2	South Dakota	10
Florida	50	Tennessee	17
Georgia	38	Texas	42
Idaho	9	Utah	7
Indiana	42	Vermont	90
Iowa	23	Virginia	156
Illinois	59	Washington	9
Kansas	18	West Virginia	40
Kentucky	30	Wisconsin	20
Louisiana	11	Wyoming	5
Maine	226		
Maryland	81	Total of 48 States	3,870
Massachusetts	438		
Missouri	21	Canada	117
Mississippi	8	Panama	3
Michigan	65	European countries (cities)	18
Montana	7	Cuba	3
Minnesota	17	South and Central America	4
Nebraska	14	Porto Rico	4
Nevada	3	Hawaii	1
New Hampshire	137	China	1
New Jersey	591	Australia	1
New York	496	Mexico	2
North Carolina	72		

In view of the enormous amount of travel from the many stations and ferries of New York City the cordial cooperation of the traffic managers of railroad and steamboat lines was essential to the perfection of any arrangement of the character described. It was the first time there had ever been regulation of travel placed upon the large number of transient visitors to that city and the many thousands who daily passed to and fro between New York and near-by communities. After consultation with the managers of the respective roads this cooperation and assurance of accord with the purposes of the measures taken were readily obtained, and throughout the epidemic the aid and assistance rendered by transportation lines were of the utmost value.

Aside from the inconvenience to travelers brought about by the necessity of securing certificates, which the public bore with equanimity and generally without complaint, the effect of the adoption of the notification system upon the volume of travel is naturally a matter of interest. Obviously it is difficult to present definite figures regarding the movement of children to and from a city the size of New York, but the following conclusions seem warranted:

The travel of children into the infected area was unquestionably diminished. The factors in producing this result were the fear of the disease, which was at all times operating, and in part also the establishment of the notification system, particularly as it related to unnecessary travel. In so far as the movement of susceptible individuals into the city was reduced, the result was beneficial and certainly of some importance in limiting the extent of the infection and protecting other communities.

The travel of children from the infected area constitutes a different question. During the early days of the epidemic, previous to the establishment of the notification system, the normal exodus of the summer season was greatly accentuated and thousands of children departed from the city, not to return until the outbreak had subsided. However, nearby communities soon began to realize the dangers from this unrestricted flow and instituted more or less rigid quarantine regulations, so that ultimately this migration was considerably decreased. Many persons also, on account of these stringent regulations, elected to remain in the city throughout the epidemic. These facts must be taken into consideration in any estimation of the volume of travel. Bearing these facts in mind it is a safe conclusion that from the middle of July until the end of the season outgoing travel was perceptibly diminished, so far as children were concerned. This conclusion is corroborated by the testimony of passenger agents who reported a decided diminution in the amount of outgoing travel as judged by the sale of tickets. While this effect was not wholly due to the operation of the notification system, it is probable that such was a factor and should, therefore, be in part credited with whatever benefits were derived therefrom.

During the course of the epidemic information, as well as direct notice, was received from many towns, especially in Connecticut and New Jersey, that an absolute quarantine against children under 16 years of age arriving from New York City had been established. In such instances the health officer of the community was immediately informed that inasmuch as further notification of arrivals would be useless instructions had been given that the issuance of notification

cards for the community concerned had been ordered discontinued until such time as the embargo was lifted. In numerous instances this had the effect of raising the restrictions and the notifying of the public of such modifications. The standardization of the methods adopted by local quarantine officers of other States, through cooperation with the plan of notification above described, was therefore an important outcome of the registration system.

Visits of health officers from adjoining States to New York City for the purpose of inspecting the work in progress and the holding of conferences relative thereto tended toward the adoption of uniform methods. In all such instances the service representative recommended daily inspection and detention of incoming children, based upon the existing notification system, and this plan was quite generally followed. Medical officers were also detailed to nearby towns to confer with local health authorities on various aspects of the situation and this also served to acquaint outside officials with what was being accomplished.

Not the least of the benefits derived was the affording of local health officers a satisfactory means of immediately locating recent arrivals in their jurisdiction and thus enabling them to institute such measures of isolation or limitation of movements as appeared necessary. So strongly did this appeal to the health officers themselves that numerous commendatory letters were received regarding the effectiveness of the system. At the meeting of the special conference of State and Territorial health officers with the service for the consideration of the prevention of the spread of poliomyelitis the measures adopted received official approval and were recommended for enforcement in all infected territory.

In regard to the direct effect the establishment of the notification system had upon the dissemination of the disease it is believed that no claims are justified. With our almost entire lack of knowledge regarding the means of transmission of poliomyelitis, whether by adults or children, and other facts of importance concerning its etiology, it would be misleading to attribute more than certain indirect benefits from the procedures instituted. In so far as travel was restricted and the commingling of those from infected and uninfected districts was prevented it is believed that benefit necessarily accrued and tended toward the reduction of the incidence of the disease. It is also safe to assert, in view of the regulation of travel from infected premises and the consequent inability to obtain the necessary certificates, that certified travel was to a degree safer than that which was uncertified.

Toward the close of the outbreak, in the latter part of September, it became problematical what effect the opening of the schools and the return to the city of many thousands of susceptible children would have upon the course of the epidemic. It was decided, therefore, to continue the work of notification, with slight modifications, until such time as this effect had opportunity to manifest itself, that is, for a sufficient number of days after the opening of schools to cover what was believed to be the ordinary period of incubation of the disease. As no increased incidence resulted from this accession of susceptible material and as the epidemic gave every indication of being upon the wane, the work of notification was discontinued on October 2, health officers throughout the country being notified to this effect.

MEASURES FOR THE CONTROL OF THE INTERSTATE SPREAD OF POLIOMYELITIS AT PHILADELPHIA AND NEAR-BY CITIES.

Owing to the threatening situation arising from the prevalence of poliomyelitis at Philadelphia, Surg. M. H. Foster was directed under orders of August 29, 1916, to proceed to that city for special duty in the prevention of the interstate spread of the disease, and subsequently received orders to visit such other communities in the States of Pennsylvania, New Jersey, and contiguous territory as was required for a similar purpose. Dr. Foster was instructed to study the conditions then existing in Philadelphia and other cities and to recommend such measures as might be necessary and practicable to prevent the interstate spread of poliomyelitis, especially to the west and south, complaints having been received from various health officers that the disease was being introduced into their section from the centers referred to through the usual avenues of communication. In carrying into effect this order Dr. Foster was directed to confer with the health officer of Philadelphia and the health commissioner of the State of Pennsylvania and to endeavor to secure their cooperation in the establishment of a Federal system of notification, affecting children under 16 years of age departing from Philadelphia for points outside the State.

An office was established in the post-office building at Philadelphia and Dr. Foster proceeded on September 1 to Harrisburg, Pa., to confer with the State health commissioner regarding the situation. At this interview that official requested time to consider the proposed plan of certification and notification, which was similar in all respects to that in force in New York City, and also stated that he wished to consult with his advisory board regarding the matter.

On September 5 Passed Asst. Surgs. J. R. Hurley and Louis Schwartz and Asst. Surgs. M. S. Lombard and T. E. Hughes were directed to report to the medical officer in charge at Philadelphia for duty, and in addition seven scientific assistants and one stenographer were nominated and placed on duty.

On September 6 the health commissioner of Pennsylvania formally declined to cooperate in the plan proposed, but on the following day advanced a counter proposal for his office to exercise control over interstate travel by having State inspectors forward notification cards to communities in other States, provided the Government would arrange to frank such notices. This offer was approved, with the understanding that the State officers should temporarily accept positions as Federal officials in order to meet the requirements of the franking privilege and to satisfy the demands of health authorities that Federal action be enforced. The plan as outlined, however, was not accepted by the State commissioner of health.

In the meantime the force detailed to Philadelphia was employed in obtaining data concerning the epidemic and the local methods in force in handling the disease in different sections of New Jersey, Delaware, Maryland and Pennsylvania. Officers were detailed to investigate the situation and confer with the local and State authorities at Camden, Newark, and Trenton, N. J., Wilmington, Del., and Chester, Stewartstown, Logan, and Lansdowne, Pa. The State health officers of New Jersey, Delaware, and Mary-

land were interviewed and expressed themselves as willing and anxious to cooperate in every way possible with the service in any measures which might be taken to prevent the interstate spread of the epidemic, and they submitted daily reports of all cases developing in their respective States, in many instances forwarding this information by telegraph. From this data incidence curves of the worse infected cities and towns were recorded and kept on file. Careful and complete studies were also made of the various transportation lines going out of Philadelphia and the number of children leaving the State from infected points ascertained by placing inspectors at the railroad and other terminals to estimate the number of outgoing passengers.

On September 9, Passed Asst. Surg. J. R. Hurley was relieved from duty at Philadelphia and directed to proceed to Baltimore for the purpose of conferring with the State health officer of Maryland relative to notification measures at that point, and on September 14 the seven scientific assistants were likewise transferred to Baltimore.

Later, on September 15, the commissioner of health of Pennsylvania notified the service representative that he would cooperate in measures for the interstate control of the disease provided the measures instituted were made applicable to the entire State of Pennsylvania and not limited to any particular section thereof. Inasmuch as this arrangement was considered impracticable, and would result in placing an entirely unnecessary burden upon travel, and as the number of new cases reported daily was rapidly diminishing, the offer was declined.

The epidemic in Philadelphia reached its maximum height the last week in August and began to slowly but steadily diminish from that time on. The same conditions prevailed in Camden, N. J., and in Wilmington, Del., although the number of cases was fewer. Newark, N. J., suffered severely, and a large number of persons contracted the disease, but the case rate decreased rapidly during the latter part of September. By October 1 it was evident that the epidemic, so far as these localities were concerned, was practically over and that no further safeguards were necessary.

MEASURES FOR THE CONTROL OF THE INTERSTATE SPREAD OF POLIOMYELITIS AT BALTIMORE, MD.

At the request of the secretary of the Maryland State Board of Health, concurred in by the health officer of the city of Baltimore, and in order to furnish State and local health officers with exact information regarding the travel of children from infected centers to uninfected districts, a notification and certification system, in all respects similar to that established at New York City, was adopted at Baltimore, Passed Asst. Surg. J. R. Hurley being detailed in charge of the operations in question under orders of September 13, 1916. On September 4 Asst. Surg. C. H. Waring was directed to report to the officer in charge for duty in this connection, and on September 22 Passed Asst. Surg. J. R. Ridlon received similar orders. In addition seven scientific assistants and three acting assistant surgeons were at various times assigned to the work.

Office space with suitable equipment was secured in the city health department building at 311 Courtland Street, this location being

such as to afford convenience to the public and ample facilities for the coordination of the work with that of the city health department. A circular letter was addressed to the general passenger agents of all transportation lines operating out of Baltimore, explaining the purpose of the system and requesting their cooperation in carrying it into effect. Officers were stationed at the main points of egress from the city and notification cards, based upon the issuance of a certificate by the city health office or the State board of health that the person did not come from premises where poliomyelitis prevailed, were forwarded to health officers at the point of destination, these cards being issued to children under the age of 16 years.

While at no time was the poliomyelitis situation at Baltimore as threatening as that at New York or Philadelphia, the wisdom of the adoption of the notification system was unquestioned. During the 18 days the work was carried on the number of certificates issued amounted to 2,258, an average of 125 per day, practically all of these persons being bound for extra-State points. Upon the discontinuance of the work of notification at New York City, following the decline of the epidemic, orders were issued for the termination of the work at Baltimore, this being effected on October 4.

COOPERATION WITH THE MASSACHUSETTS STATE BOARD OF HEALTH IN INVESTIGATIONS OF POLIOMYELITIS.

Upon the request of the health commissioner of the State of Massachusetts service cooperation with the health organization of that State was undertaken in connection with the epidemic outbreak of poliomyelitis, and on September 22 Surg. L. D. Fricks was directed to confer with the commissioner of health and to render such assistance as was feasible. In conformity with this order and following the aforesaid conference Dr. Fricks was requested to proceed to Holyoke, where poliomyelitis was then epidemic, in order to relieve as far as possible the tense feeling which existed in the community and at the same time to assist the local health authorities in collecting epidemiological data bearing upon the influence of a comparatively rigid quarantine on the extent of the outbreak.

During the latter part of June and the early part of July there was an unusually heavy influx of families containing small children into Holyoke from New York City, the majority of these families leaving on account of the epidemic of poliomyelitis. On July 15 a case of infantile paralysis was discovered in a child recently arrived from New York City, and following the appearance of this case all families coming from suspected districts and all children from New York presenting service certificates were quarantined. No other cases were discovered until August 16, but between that time and October 1, 73 cases were reported, an incidence of slightly more than one per thousand.

The local health authorities made unusual efforts to secure the early diagnosis of poliomyelitis cases, two physicians being employed to study and report on all illness occurring among children. In this way early recognition of the disease was possible. All patients, with few exceptions, were immediately removed to a specially constructed hospital and the family from which the patient came was quarantined, together with other families using the same entrance in

apartments and tenements. Day and night watchmen were employed to guard all entrances and food supplies were furnished and delivered by the city during the period of quarantine. There can be no question that by the adoption of these methods direct personal contact between families in which the disease prevailed with others in the community was greatly restricted.

Considerable time was spent in assisting in the collection of epidemiological data and in so far as the cases observed were concerned the following conclusions were warranted: In the great majority of instances it was impossible to trace any direct contact with a previous frank case of the disease. While there were instances of more than one child in the same family being afflicted the rule was that those who became ill did so at or about the same time. Although several were under 1 year of age it was impossible to rule out all articles of diet other than mother's milk. No unusual presence of any biting insect was found and no single insect was discovered common to every infected house. None of the cases in Holyoke showed any very close connection with New York families, 66 in number, certified by the service and arriving in Holyoke subsequent to July 15 (it was fairly certain that these persons came from premises where poliomyelitis did not prevail), but there was an apparent connection between the homes visited by New York families earlier in the season and the points at which the earliest cases developed (many of these families doubtless came from homes where the disease was present).

The amount expended by the city of Holyoke in attempting to control the epidemic and in the quarantine and treatment of cases was upward of $80,000. The part which was spent for sanitary surveys and the general improvement of conditions throughout the city was undoubtedly well expended. In conducting these surveys more than 100 unreported cases of measles and scarlet fever were discovered. By the construction of a special hospital for the treatment of infantile paralysis and the prompt diagnosis and early treatment of all cases, together with trained nursing, the patients received much better care than would ordinarily be accorded.

COOPERATION WITH MONTANA STATE BOARD OF HEALTH IN INVESTIGATIONS OF POLIOMYELITIS AT BILLINGS, MONT.

During the latter part of July, 1916, poliomyelitis appeared at Billings and other points in Montana, notably on the Crow Indian Reservation. Owing to the fact that certain local physicians were unable to agree on the diagnosis of these cases, many believing them to be cases of epidemic cerebro-spinal meningitis, the Montana State Board of Health requested that a service officer be detailed to investigate conditions. Accordingly, Surg. L. D. Fricks conducted an investigation during the early part of August, and subsequently Passed Asst. Surg. A. J. Lanza received instructions to institute a careful survey of the situation. It was ascertained that the epidemic, which while not extensive resulted in a high mortality, was unquestionably poliomyelitis, as bacteriological examination of the spinal fluid gave no evidence of meningitis, while a number of patients presented distinct paralyses, and that in all probability the disease had been spread by contact. Measures for suppressing the epidemic were recommended.

COOPERATION WITH THE STATE BOARD OF HEALTH OF MAINE IN INVESTIGATING POLIOMYELITIS AT ROCKLAND, ME.

Upon the request of the State Board of Health of Maine and the health authorities of the city of Rockland, Surg. D. E. Robinson on October 7, 1916, was ordered to proceed to Rockland, Me., for the purpose of investigating an outbreak of poliomyelitis and advising with the local authorities concerning measures for the control of the disease. The history of the epidemic, at the time the investigation was undertaken, showed that 37 cases had occurred in the city proper, with 9 deaths, and that 15 cases had developed in contiguous territory. While the local authorities had adopted energetic measures for the control of the infection, some question had arisen on the part of the public as to the necessity for the enforcement of such rigid restrictions. After carefully reviewing the situation and making a study of the cases which had developed definite recommendations were advanced concerning reasonable measures to be adopted for the control of the epidemic.

PLAGUE SUPPRESSIVE MEASURES IN NEW ORLEANS.

The period between June 30, 1916, and June 30, 1917, marked the third year in which plague suppressive measures were carried on in New Orleans. During this time service operations have been conducted as in previous years with but few minor changes. These changes have been characterized mainly by greater attention to specific rat-proofing problems, such as the delay occasioned by property owners on account of inadequate funds, conditions presenting engineering difficulties, careful inspection of new buildings, and cases in which owners resisted all efforts to make their properties rat proof. With the close of each fiscal year the problems of the succeeding year become correspondingly more difficult, owing largely to the fact that the places remaining nonrat-proof belong either to those who are financially unable to make the necessary alterations, or to those who will not willingly cooperate. During the past fiscal year, however, it is of interest to note the following:

There has been an entire absence of human plague and an apparent suppression of the epizootic, as evidenced by the fact that during the past six months but three infected rodents have been reported and these at widely separated points, the last of which was confirmed on April 24, 1917.

A large number of very bad conditions have been remedied.

The number of rodents examined at the laboratory has been considerably lessened.

Conditions along the water front are apparently improving.

The average number of fleas per rat on June 30, 1917, had markedly lessened as compared with the corresponding date of the preceding year.

According to the board of health for the city of New Orleans and parish of Orleans, the general health of the community has improved, owing in part to the general cleaning up incident to rat proofing.

Incidentally it has been estimated by the fire marshal, that as a result of rat-proofing operations, the number of fires during the past two years has been reduced, as compared with preceding years.

GENERAL ORGANIZATION.

The general plan of organization during the past fiscal year has remained practically unchanged. Owing, however, to increasing numbers of buildings becoming rat proofed and to the general efficiency of the employees the working force has been materially reduced in numbers and in several instances districts have been merged. On July 1, 1916, the total number of employees was 304, and on July 1, 1917, the total number was 197. Districts Nos. 1 and 3 and Algiers have been merged into one district and placed in charge of a single officer. Districts Nos. 4 and 5 have likewise been merged. This leaves the city divided into four more or less equal parts, each division being in charge of a separate officer. Rat proofing in St. Bernard Parish, including the towns of Chalmette, and Arabi, has continued under the supervision of the officer in charge of district No. 5. As yet no rat-proofing operations have been undertaken in the towns of McDonoghville, Harvey, Gretna, Amesville, or Westwego, these towns being contiguous to Algiers and across the Mississippi River from New Orleans.

During the year the work of plague eradication has been under the direction of Passed Asst. Surg. Friench Simpson, assisted at various times by the following officers: Passed Asst. Surgs. C. L. Williams, J. H. Smith, jr., and J. B. Laughlin; Asst. Surgs. H. C. Cody, C. V. Akin, M. S. Lombard, W. C. Teufel, R. R. Sayers, W. F. Wagenbach, and R. E. Dyer; Acting Asst. Surgs. M. D. Hollis, G. McG. Stewart, Park Howell, and Percy Ahrons.

LEGAL ENACTMENTS.

Regarding court procedures there is nothing of special importance to note. Ordinance No. 2512, commission council series, under which plague operations have been conducted, remains in force and during the past year apparently all disputes as to its legality have ceased. There were filed during the year 4,226 affidavits for failure to rat proof premises. Of this number 2,146 were either acquitted or withdrawn before trial on account of completion of the work; 1,596 are still pending owing to work being in progress, some work having been done, or the case not having been called into court; 346 cases were convicted, and of this number 138 appealed to a higher court. The total fines paid in for failure to rat proof amounted to $2,410. Compared with the preceding year there has been a great increase in the amount of fines imposed, the total in 1915–16 amounting to only $805.

OUTGOING QUARANTINE.

There has been no cessation in quarantine procedures as applied to ships docking at the wharves in New Orleans. As described in previous reports it is necessary that all ships be properly fended off and rat guarded and those vessels which have not been fumigated

within the preceding four-month period are required to undergo fumigation, in lieu of which they are given a foul bill of health. The fumigant now in general use for the deratization of vessels is hydrocyanic acid gas, the generation of which is described in the annual report for 1915, no change in this procedure having been made. It is desired to call attention to the fact that during the past year no difficulties have been encountered incident to the handling of hydrocyanic acid gas, either among the crews of vessels fumigated or those conducting the fumigation.

A departure of note is to be found in a recent ruling that ships docking at so-called rat-proofed wharves need not resort to fending off or rat guarding. During the fiscal year ending June 30, 1916, a marked difference was found in the number of rats caught on rat-proofed and those on nonrat-proofed wharves. This finding has been amply confirmed throughout the past year, an example of which is the following: From the Julia Street wharf, which is rat-proofed, 10 rats were caught between the period of October 1, 1916, and July 1, 1917. From the Erato Street Wharf, which is separated from the latter by the St. Joseph Street Wharf, during the same period of time 367 rats were caught. With these facts in mind and believing that the owners of the wharves and the steamships should derive some benefit from their labors in attempting to reduce the rodent population, the matter was brought to the attention of the commission council with a recommendation that a law be passed relieving steamships docking at these rat-proofed wharves from fending off or rat guarding. This was acted upon favorably and the law was passed.

After fumigation a careful search is always made of all vessels for dead rats. These are collected and sent to the laboratory where they are subjected to the same routine examination as all other rodents trapped.

The following table gives in detail the routine quarantine operations during the past year:

Outgoing quarantine, July 1, 1916, to July 1, 1917.

Number of ships clearing	661
Number of bills of health issued to ships clearing	1,934
Clean bills of health issued	1,792
Foul bills of health issued	142
Approximate tonnage clearing from port	1,335,000
Local boats (mostly intrastate) fumigated and given certificates	81
Approximate tonnage of such boats	3,929

Fumigation.

Number of ships fumigated with hydrocyanic acid gas	681
Number of ships fumigated with sulphur dioxide	81
Total fumigations	762
Pounds sodium cyanide used	37,811
Pints sulphuric acid used	56,797
Pounds sulphur used	3,390

LABORATORY.

The general routine of laboratory procedure has remained practically the same as during the preceding years and no efforts have been spared to detect any case of rodent plague. As heretofore, the

macroscopic method of diagnosis is given first place and this is supplemented by a biological and microscopic examination in all suspected cases. The total number of rodents received during the past year was 387,732. Of this number 77,071 were examined, 42 of which were proven positive for plague. In connection with the laboratory report the following facts should be noted:

There was a decrease in the actual number of infected rodents as compared with the preceding year.

The number of rodents suspected of having plague was markedly lessened.

The number of rats showing well-marked signs of plague was smaller proportionately than the preceding year.

The number of rats showing indefinite signs of plague was proportionately large.

Following plague inoculations a longer time proportionately was required to kill experimental animals.

Typical cultures have been correspondingly harder to secure.

There have been no infected mice.

The flea count per rat examined was greatly reduced as compared with the preceding year.

Referring to the decrease in the proportionate number of rats showing well-marked signs of plague and the greater length of time required to kill experimental animals, it is inferred that this condition is the result of either one of two conditions or both, namely: A decrease in the virulence of the infecting organism or a greater resistance on the part of the rodent.

The following tables give in detail all laboratory operations during the past year:

Number of animals examined during the year ending June 30, 1917		77,071
Number of animals examined during the year ending June 30, 1917, by sex and species, as follows:		
Mus norvegicus:		
Male	9,631	
Female	24,815	
Mus rattus:		
Male	4,138	
Female	6,287	
Mus alexandrinus:		
Male	3,831	
Female	5,469	
Mus musculus	12,660	
Wood rats (*Neotoma floridana rub.*):		
Male	451	
Female	317	
Wood rats (*Sigmodon nispidus*):		
Male	4,955	
Female	2,823	
Wood rats (*Hesperomys palustris*):		
Male	782	
Female	184	
Muskrats (*Fiber zibethicus*):		
Male	72	
Female	58	
Proechimys centralis:		
Male	79	
Female	213	
Rodents examined		76,765

Number of animals examined, etc.—Continued.		
Opossums:		
Male	92	
Female	102	
Squirrels	1	
Rabbits	1	
Unclassified:		
Male	35	
Female	75	
Miscellaneous animals examined		306
Total animals examined		77,071
Animals not examined		310,661
Animals received at the laboratory		387,732
Number of animals received during the year ending June 30, 1917		387,732
Number of animals received during the year ending June 30, 1917, by species:		
Mus norvegicus	34,446	
Mus rattus	10,425	
Mus alexandrinus	9,300	
Mus musculus	314,964	
Putrid rodents	8,356	
Wood rats (*Neotoma floridana rub.*)	768	
Wood rats (*Sigmodon nispidus*)	7,778	
Wood rats (*Hesperomys palustris*)	966	
Musk rats	130	
Proechimys centralis	292	
Rodents received		387,425
Opossums	194	
Squirrels	1	
Rabbits	1	
Unclassified	110	
Diamond-back terrapins	1	
Miscellaneous animals received		307
Total		387,732
Plague-infected rats, by species:		
Number of *Mus norvegicus*		36
Number of *Mus rattus*		4
Number of *Mus alexandrinus*		2
Number of *Mus musculus*		0
Total		42
Lesions found in infected rodents:		
Subcutaneous injection		30
Buboes:		
Cervical only		3
Axillary only		1
Inguinal only		4
Multiple		0
Any type		1
Granular liver		18
Granular spleen		1
Pleural effusion		21
Abscess of liver		1
Necrosis of liver		0
Abscess of spleen		2
Adhesions of spleen		1
Scars on spleen		3
Ruptured spleen		0
No lesions (plague-like organisms in smears only sign)		7
No lesions (animals inoculated because rat was caught at infected location)		0

Comparative figures of rats showing well-marked macroscopic signs of plague; rats showing slight or indistinct signs; rats showing no macroscopic signs but with plague-like organisms in smears and rats showing signs of resolving plague:

Infected rats showing well-marked signs	8
Infected rats showing slight or indistinct signs	21
Infected rats showing no signs	1
Infected rats picked out on smears only	7
Infected rats showing signs of resolving plague	5
Total number of infected rats	42
Total number of rats *not* showing marked signs of plague	34

Flea infestation of rats.

[Average number of fleas per rat.]

Week ending—	Mus norvegicus.		Mus rattus and alexandrinus.	
	Xenopsylla cheopis.	Ceratophyllus fasciatus.	Xenopsylla cheopis.	Ceratophyllus fasciatus.
1916.				
July 8	7.6660		2.7270	
July 15	0.9740		1.1660	
July 22	8.1095	0.0273	9.4000	
July 29	6.9387		4.0000	
Aug. 5	8.4375		12.5400	
Aug. 12	6.1607		4.2500	
Aug. 19	5.2886			
Aug. 26	3.9670		8.6666	
Sept. 2	4.2105	0.1052	2.7500	3.0000
Sept. 9	4.7317	0.0243	6.1250	2.5000
Sept. 16	1.1481		5.2850	
Sept. 23	2.1378		2.5000	
Sept. 30	3.1428		1.5000	
Oct. 7	1.5116		1.0000	
Oct. 14	1.9375		1.7270	
Oct. 21	3.5860		0.0178	0.6920
Oct. 28	7.2352		0.6250	
Nov. 4	0.9166		1.0000	
Nov. 11	2.0000	0.0434	0.3333	
Nov. 18	3.2608	0.0434	3.3333	
Nov. 25	2.2857		0.2000	2.0000
Dec. 2	1.0000	0.5000		
Dec. 9	0.3000		0.5000	
Dec. 16	0.4500	0.6900	2.8000	
Dec. 23	1.2600	0.0660	0.8000	0.4000
Dec. 30	0.9400	0.7300	0.8500	0.1400
1917.				
Jan. 6	2.3800		0.1330	
Jan. 13	0.7600	0.3000	0.1660	0.5000
Jan. 20	1.5000	0.5000	11.0000	1.0000
Jan. 27	0.4000	0.0600	1.5700	0.1420
Feb. 3	1.3000	0.1800	0.5000	
Feb. 10	0.8000			
Feb. 17	0.7000	0.1000	0.5000	
Feb. 24		0.0690	1.0000	
Mar. 3	0.4000	0.0700		
Mar. 10	1.1000			
Mar. 17	0.3000	0.1200	0.1420	
Mar. 24	2.5000	0.6000	0.3330	
Mar. 31	0.3600			
Apr. 7	1.0500		0.4000	
Apr. 14	0.2800		0.2500	
Apr. 21	1.2000	0.7000		0.2850
Apr. 28	2.1000			
May 5	3.7000			
May 12	2.6666		4.7777	
May 19	0.8373		0.6666	
May 26	0.5000			
June 2	3.1700	0.0280	1.0000	
June 9	3.0180		0.5000	0.5000
June 16	3.5480		2.0520	
June 23	0.9180			
June 30	3.7500		2.3330	

INCIDENCE OF THE EPIZOOTIC.

The infected rats trapped during the past year were from widely scattered points, including six from the town across the river opposite New Orleans. Places yielding infected rodents were as follows:

City of New Orleans, from widely scattered points	34
Algiers	2
McDonoghville	3
Westwego	1
Chalmette	1
Steamship *Eggsford*	1
Total	42

As will be seen from the tabulation a plague infected rodent was captured aboard a vessel, the steamship *Eggsford*. The record of this vessel showed that for the year previous to her arrival she had not docked at any port known to be plague infected and accordingly, upon reaching quarantine, she was inspected and passed without fumigation. Upon her arrival at New Orleans on September 20, 1916, she was fended off and rat guards adjusted to all mooring lines in the customary manner. Trapping was instituted throughout the ship on the following day. At the first inspection 31 rats were found trapped and were immediately forwarded to the laboratory for examination. Among this lot a female *Rattus* was found plague infected. Since the vessel was fended off and properly rat-guarded and the rodents trapped were obtained within 24 hours after arrival, the evidence strongly favors the assumption that plague existed in this ship prior to arrival in New Orleans. Subsequent trapping operations gave a gradually decreasing number of rodents and upon fumigation 6 remaining rats were recovered, making a total of 69 rodents obtained while the vessel was in port. All of these, with the exception noted, proved to be negative for plague infection.

Conditions at the close of the past fiscal year were far more hopeful than they were at the beginning. During the month of June, 1916, 15 plague-infected rats were reported and apparently at that time there were no signs of an abatement of the epizootic. Between July 1, 1916, and January 1, 1917, a period of six months, 39 infected rats were confirmed as follows:

July	6
August	8
September	12
October	7
November	4
December	2

In the succeeding six months from January, 1917, to July 1, 1917, only three infected rodents were reported, the last one on April 24, 1917. With the approach of summer weather it was feared that there might be an increase in the number of rodent cases. This, however, has not been borne out, and during the period when the largest number of cases might be expected not one has been discovered. Instead of the expected increase there has been a decrease not only in the number of positive rodents but in rats showing even suspicious signs as evidenced by the laboratory report. Three things would appear to have a bearing upon this:

First. A lesser number of rodents caught.

Second. Apparent attenuation of infecting virus as evidenced by increasing lengths of time required before a rat suspected of having plague can be declared positive for plague. Plague rat No. 351 was caught December 29, 1916, and the diagnosis was not confirmed until February 11, 1917, during which period the virus was passed through 5 guinea pigs and 2 white rats.

Third. The great reduction in the number of fleas per rat counted as compared with a corresponding period of the preceding year. In June, 1917, the highest average number of fleas per rat was 3, and in June, 1916, the highest average number of fleas per rat was 7, a difference of 4 fleas per rat.

Of these, the attenuation of the infecting virus would seem to be the great factor, with the lessened flea count playing an important though secondary rôle.

SOURCES OF INFECTION.

While the 42 rats infected with plague were captured at widely scattered points and in a great variety of premises, it is interesting to observe that none of them were taken at previously known rodent plague foci, and in only one instance, that of Fabacher's dairy, McDonoghville, was more than one infected rat caught. At the last-named point two infected rodents were trapped. Following is a list of the character of places from which infected rodents were captured:

Dwellings, in yards	14
Dwellings, inside	1
Open lots, in garbage dumps	3
Business establishments, in yards	2
Business establishments, inside	5
Dairy, in yard	2
Food depot, inside	4
Food depot, in yard	3
Stables, inside	1
Drains	3
Sewers	2
Wharves	1
Ships	1
Total	42

TREATMENT OF FOCI.

Premises at which plague-infected rats were caught continue to be treated as heretofore. Removal of planks from yards and sheds; elimination of rubbish and all loose material from the ground area and rat-proofing of all permanent structures. With the great decrease in rodent plague there have been but few foci requiring attention and generally there is little to be done, owing to completion of a large amount of rat-proofing.

TRAPPING.

It is hardly necessary to state that trapping operations are of great importance in a plague eradicative campaign and for this reason every effort has been made to keep the trapping force in a highly efficient state. The general routine as previously carried out has been

observed during the past year, and there have been no innovations worthy of mention except perhaps in district No. 7, in which area all traps are moved simultaneously from one territory to another about once in every month. The traps are placed throughout a given territory and are then watched and baited for the specified length of time, after which they are again moved and carried to another location. This method is of doubtful value, as it necessitates the loss of two or possibly three days of trapping in every month, requires extra labor to handle the traps, and means the withdrawal of traps from known rat harbors.

At the beginning of the past fiscal year, there were 143 trappers in the several districts. Through a general reduction in force, increased skill on the part of the trappers, and lessened rat catch, it has been possible to reduce this number to 106 trappers, handling, approximately, 912 cage traps and 19,695 snap traps.

The accompanying form gives the total rat and mouse catch for the fiscal year ending June 30, 1917, as compared with the preceding years.

Species.	1917	1916	1915
Mus norvegicus	34,446	55,473	206,137
Mus rattus	10,425	8,163	7,357
Mus alexandrinus	9,300	8,222	8,704
Total	54,171	71,858	222,198
Mice	314,964	293,490	154,988
Wood rats	9,794	.....	.....
Unclassified	8,356	6,165	2,401
Muskrats	130	.....	.....
Total	387,415	371,513	379,587

From an inspection of the foregoing table, it is seen that the total rodent catch for the past fiscal year exceeds by 15,902 that of the preceding year. This is largely due to the increased number of mice caught. It is also noted, as compared with the preceding years, that there has been a decrease in the total number of *Mus norvegicus* caught and an increase in the number of *Mus rattus* and *Mus alexandrinus*. The increase in the number of *rattus* and *alexandrinus* trapped is largely due to the increased number being caught aboard ships. The average number of *Mus rattus* and *Mus alexandrinus* trapped throughout the city inclusive of the commercial districts remains about the same as for the preceding year. This speaks rather well for the rat-proofing and rat-trapping operations of the past, because as the Norway rats decrease in number, one usually expects to find that the *rattus* and *alexandrinus* will increase in number.

In connection with rat-trapping operations, it is well to mention the number of rats trapped aboard ships and on wharves. During the year there were 11,938 rats of all species trapped aboard ships, and in the same time there were 2,037 trapped on wharves. The large number of rats caught aboard ships is probably the result of changes in trade routes incident to the war bringing an increased number of vessels to the port which have heretofore not undergone systematic fumigation for the eradication of rats.

It is thought advisable to again mention the rat catch from the nonrat-proofed as compared with the rat-proofed and relatively rat-

proofed wharves. There are approximately 20 wharves along the New Orleans water front. Of these 7 are either rat-proofed or relatively so; 13 remain nonrat-proof. From the rat-proofed and relatively rat-proofed wharves 223 rats have been caught during the past 9 months, and from the nonrat-proof wharves 1,240 rats. This is a very strong argument in favor of rat-proofing the docks. It is hoped that the removal of restrictions from ships docking at rat-proof wharves will act as a stimulus toward getting the remaining docks rat-proofed. Attention is called to the fact that 1,080 of the 1,240 rats trapped were taken from five wharves, namely: Pauline Street, Bienville Street, Erato Street, Robin Street, and Celeste Street. The explanation for the great difference in rat catch from the various nonrat-proofed wharves probably lies in the fact that a number of the wharves are now used for the handling of lumber and munitions and the remaining wharves handle but a small amount of loose foodstuffs.

RAT-PROOFING.

During the past year there has been little or no change in the general methods employed in the rat-proofing of buildings. As heretofore, every effort has been made to discover those places which were in a structurally bad condition or which might be harboring rats. All new buildings while in the course of erection have been carefully inspected with a view to correcting anything which might be the cause of the property becoming a rat harbor in the future. In an effort to eliminate dishonesty on the part of contractors, and carelessness on the part of inspectors, a double check has been required on all premises before they were declared completed and ready for abatement.

There was no organized opposition to rat-proofing during the past year, but as previously mentioned the buildings which remain nonrat-proofed, as a rule, either belong to those too poor to make the necessary repairs, or to those who have persistently opposed all such measures. It is the latter class of cases which at present is causing the greatest amount of delay. The inspecting force during the past year has been materially reduced, and at the close of the year there were on duty 34 inspectors and assistant inspectors whose duty it is to supervise the rat-proofing of buildings.

Mention should be made of the work which has been done in the Parish of St. Bernard, principally in the towns of Arabi and Chalmette. Upon the finding of a plague-infected rodent in these locations it was considered necessary that some action be taken toward rat-proofing. As a result the necessary laws were enacted and the owners of the properties readily cooperated with the service in an effort to eliminate all rat harborage. There is a total of 646 main and rear buildings in these towns, of which number 283 have been completely rat-proofed, 120 partially completed, while 230 remain noncompliant. The cost of operations has amounted to $15,969.

Again referring to those towns across the river from New Orleans (McDonoghville, Harvey, Gretna, Amesville, and Westwego), it is well to state that a number of plague-infected rodents have been trapped from time to time. There are in these towns many very bad rat harborages, and efforts have been made to have the necessary laws

enacted that rat-proofing operations might be carried out. There has been, and still is, marked opposition to the enactment of any such law, and other than intensive trapping, nothing has been done toward the elimination of rodents.

The following is a tabulation of rat-proofing operations for the past year:

Recapitulation of rat-proofing operations at New Orleans for fiscal year ending June 30, 1917.

Buildings:	
Completed, rat-proofed	39,715
Incomplete, work begun	35,620
Noncompliant, no work done	7,260
Previously and originally rat-proofed	94,192
Demolished	5,618
Total number	182,405
Work performed:	
Square yards concrete laid	428,609
Linear feet chain wall installed	887,948
Linear feet flashing laid	274,729
Square yards tar-cinder floor laid	8,652
Linear feet wall fill installed	89,850
Total cost of rat-proofing	$2,166,510.86
City blocks	5,436
Main buildings	185,366
Rear buildings	96,566

	Rat-proofed.	Noncompliant.	Total.
Dwellings	59,867	12,530	72,397
Food depots	2,687	1,734	4,421
Stables	2,447	1,997	4,444
Miscellaneous business buildings	3,420	603	4,023
Cisterns	25,436	2,912	28,348
Chicken yards	4,989	3,627	8,616

Garbage cans installed	20,164
Premises fumigated	0
Premises sprayed with pulicide kerosene emulsion	0
Planking removed from open yards, etc. (sq. yds.)	711,721
Legal cases:	
Acquitted or withdrawn at request of service	2,146
Convicted	346
Appealed	138
Pending June 30, 1917	1,596
Amount of fines imposed	$2,410

PLAGUE-SUPPRESSIVE MEASURES IN CALIFORNIA.

At the beginning of the fiscal year the activities of the service were under the supervision of Senior Surg. C. C. Pierce, who has remained in charge throughout the year. During his absence from September 22, 1916, to June 30, 1917, Passed Asst. Surg. C. L. Williams has been in temporary charge. The Federal laboratory was conducted under the direction of Bacteriologist M. T. Clegg from July 1, 1916, until his resignation July 10, 1916; from then until May 9, 1917, under the direction of Mr. Edmund D. Margrave, who, on December 11, 1916, was appointed temporary assistant sanitary engineer; from May 19, 1917, until June 30, 1917, the laboratory was under the direction of Bacteriologist Charles M. Anderson.

REENTRY OF PLAGUE INFECTION INTO THE CITY AND COUNTY OF SAN FRANCISCO.

On May 21, 1917, a ground squirrel shot by one of the service employees in the county of San Francisco about one mile north of the line between the counties of San Francisco and San Mateo, and a mile southwest of that portion of the city known as Glenn Park, was found on examination to be infected with bubonic plague. This infection is apparently the logical extension of plague infection in a northerly direction through the county of San Mateo. Such an extension has been forecast for a number of years and it is not surprising that it has at length occurred. As yet there are no indications of the spread of the infection to rats.

OPERATIONS IN SAN FRANCISCO.

On June 30, 1916, the Public Health Service officially severed its connection with plague suppressive measures in the city of San Francisco, this work thereafter being carried on by the San Francisco department of health. At their request the work has been supervised by service officers in charge of other plague suppressive measures in the State, and the efforts of previous years toward the control of rodent infestation have been continued.

Paucity of funds has made it impossible during the past year to do any extensive trapping of rats. However, one man has been kept busy on this work, mainly along the water front, all rats secured being examined, as heretofore, at the service laboratory. During the year there were trapped and examined a total of 4,199 rats, none of which were found infected with plague. The number by species was as follows:

Mus norvegicus	1,330
Mus rattus	1,036
Mus alexandrinus	1,833

In addition to the trapping operations poisoning was carried out as in previous years, one man being assigned to this duty. All complaints regarding the scattering of foodstuffs, uncovered and damaged garbage cans, and improperly constructed chicken yards were carefully investigated, a total of 2,433 complaints of this nature being received and the responsible parties notified regarding proper measures for abatement. The ordinance providing for the inspection of garbage cans and their maintenance in a state of repair was enforced as heretofore. The work of destroying rat harbors, consisting mainly in the removal of old wooden floors and the closing of dead spaces, was carried on in a systematic manner, and the enforcement of the city ordinance providing for the rat proofing of buildings, particularly as regards food places and new buildings, was continued.

The health department of San Francisco has signified its intentions of maintaining the plague preventive work in the city of San Francisco during the fiscal year 1917–18. This is rendered all the more necessary by the discovery of a plague infected ground squirrel within the county limits.

The measures adopted to free shipping of rats in San Francisco were carried on directly by the Public Health Service, the officer

in charge of plague-suppressive measures in California cooperating with the quarantine station by supplying and directing an inspection and trapping force operating on vessels in ports and on wharves and property immediately adjacent thereto. Besides trapping rats this force sees that vessels obey the quarantine regulations in regard to plague, and assists, when needed, in the fumigation of ships. The following table summarizes the work accomplished:

Number of inspections made of vessels for rat guards	903
Number of vessels inspected for rat guards	261
Number of reinspections made of vessels	133
Number of new rat guards procured	211
Number of defective guards repaired	8
Number of rats trapped on wharves and water front	2,341
Number of rats trapped on vessels	1,181
Average number of traps set on wharves and water front	396
Average number of traps set on vessels	30
Number of vessels trapped on	82
Number of times trapped on	1,743
Number of poisons placed on water front (pieces)	91,800
Bait used on water front and vessels, bacon (pounds)	263
Amount of bread used in poisoning on water front (loaves)	306
Number of pounds of poison used on water front	102
Number of vessels fumigated	118
Number of vessels searched for dead rats after fumigation	90
Number of dead rats taken from vessels after fumigation	439

OPERATIONS FOR THE ERADICATION OF PLAGUE AMONG GROUND SQUIRRELS.

Since the discovery of a plague-infected ground squirrel, May 21, 1917, it has been possible only to institute intensive hunting operations in San Francisco County with the object of delineating infected areas as well as killing the ground squirrels. It is expected during the coming fiscal year to institute more extensive eradicative measures and to conduct a further plague survey of rats in San Francisco. During the year operations for the eradication of plague among ground squirrels in other parts of the State have been carried out in the following counties: Contra Costa, Alameda, Stanislaus, Merced, San Mateo, Santa Clara, Santa Cruz, San Benito, and Monterey.

In all of these counties the general procedure has been the same. This procedure, as in past years, has been the inspection of all territory, followed by the serving of notices on the owners of squirrel-infested lands making it mandatory upon them to institute eradicative measures; reinspection to determine the results obtained by the owners, and the enforcement of the work upon those lands upon which no work has been done or poor results obtained—this latter through use of a law empowering the State to do the work in such cases and to collect the bill for the same from the boards of supervisors of the various counties in which the work is done. In carrying out this plan every assistance was given to the landowners by the inspection force, such assistance ranging from advice to active help in mixing and placing poisoned grain or in the use of carbon bisulphide or other means of squirrel destruction. In addition to this, hunting operations were carried out throughout the county of San Mateo and, to a slight extent, in the counties of Alameda, San Benito, and Santa Cruz.

RESULTS OF HUNTING OPERATIONS.

In view of its importance as the only county adjacent to the county of San Francisco extensive hunting operations were carried on in San Mateo County and the southern portions of San Francisco. All squirrels shot were sent to the laboratory for examination. On March 16, 1917, a plague-infected squirrel was shot 2 miles west of the city of San Mateo and on April 4, 1917, a plague-infected squirrel was found dead at almost the same spot. The infected squirrel shot in San Francisco County has been referred to in a previous section of this report.

Sporadic hunting in Alameda, Santa Cruz, and San Benito Counties has brought to light 24 plague-infected squirrels in Alameda County, 9 plague-infected squirrels in Santa Cruz County, and 7 plague-infected squirrels in San Benito County. The following tabulation shows the ranches on which these squirrels were secured:

Ranch.	Infected squirrels.	Date last infected squirrel found.
Alameda County:		
J. Leonardo	1	June 4, 1917
H. C. Peterson	1	June 8, 1917
Wm. Hohler	2	June 12, 1917
J. Leonardo	2	Do.
Carrie Gunn	1	June 11, 1917
C. W. Carroll	2	June 16, 1917
M. J. Crocker	3	Do.
Flynn Bros	1	June 13, 1917
Frank Floyd	3	June 15, 1917
Amelia Webber	1	June 14, 1917
John Egan	1	June 16, 1917
Annie Owen	1	June 23, 1917
T. J. Egan	1	June 26, 1917
J. Leonardo	2	Do.
E. Hartman	1	June 27, 1917
B. E. Goechen	1	June 29, 1917
Total	24	
Santa Cruz County:		
Chittendent Grant (Kemp Van E. E. Bauman)	5	May 23, 1917
Do	3	May 29, 1917
G. F. Sillman	1	June 27, 1917
Total	9	
San Benito County:		
N. Hinshaw	1	July 1, 1917
B. D. Sindel	2	June 7, 1917
Blanchard & Whitman	2	June 22, 1917
B. D. Sindel	1	June 19, 1917
Dooling Bros	1	June 28, 1917
Total	7	
San Mateo County:		
Spring Valley Water Co	1	Mar. 16, 1917
Do	1	Apr. 4, 1917
Total	2	
San Francisco County: Wells Fargo property near Glenn Park	1	May 21, 1917
Total for year	43	

The work accomplished in the eradication of squirrels during the past fiscal year may be summarized as follows:

Eradicative operations.

Number of inspections	6,362
Number of reinspections	18,003
Number of acres inspected	2,783,673
Number of acres reinspected	6,610,383
Number of acres treated with waste balls	278,909
Number of acres treated with destructors	3,870
Number of acres treated with poisoned grain	2,720,751
Number of acres treated with hose and funnel	37,167
Number of acres treated with straw smoke, distillate, and sulphur	427
Number of holes treated	1,255,662

LABORATORY OPERATIONS, SAN FRANCISCO, CAL.

At the laboratory the routine examination of squirrels, rats, and other rodents for the determination of plague has been continued. The squirrels were obtained by hunting operations, while the rats were secured principally through trapping in the city of San Francisco. A considerable number of rats, however, were sent to the laboratory from the cities of Alameda and Oakland, where trapping has been carried out for varying lengths of time by the respective city health departments. No case of plague infection was found among the rats. The following is a tabulation of the examinations for plague:

Rodents.	Examined.	Infected.
Squirrels	4,174	43
Rats	3,193	0
Other animals	11	0

EXPERIMENTAL WORK.

Experiments were instituted during the year to determine the possibility of infecting ground squirrels with rat leprosy. A number of squirrels were inoculated with diseased tissues from leprous rats, but in no case were positive results obtained.

In order to determine the availability of a smoking device as a means of ground-squirrel destruction, certain experiments were conducted. A comparatively light weight form of smoker was constructed consisting of a sheet-metal pipe with a centrifugal blower mounted at the top. The device was operated by filling the pipe with straw, igniting it at the top, and creating a draft through the straw with the blower. A very heavy smoke was readily obtained, which could be directed into the squirrel burrow by placing the lower open end of the smoker in the mouth of the burrow and tamping around it with earth. By the use of an artificial burrow constructed at the laboratory it was shown that smoke could be forced considerable distances and that guinea pigs were readily killed within five minutes. More extensive experiments in the field will be carried out in this connection within the next fiscal year.

ASSISTANCE TO OTHER BRANCHES OF THE SERVICE.

The necessary bacteriological examination of large numbers of immigrants from portions of the Orient were made at the laboratory, to determine whether or not they were cholera carriers. This work was done in cooperation with the quarantine station on Angel Island, and was greatly facilitated by the assistance of the medical officer in charge of the medical inspection of immigrants at the port of San Francisco. A total of 3,449 persons were examined, none of whom, however, were found to carry the cholera vibrio. These examinations were maintained from September 20, 1916, to February 23, 1917.

During the year clinical work in the laboratory has been performed for the following institutions: United States marine hospitals, San Francisco and Los Angeles, Cal., Port Townsend, Wash., and Portland, Oreg.; United States immigration hospital, Angel Island, Cal.; and the United States Indian Service at various locations in the Western States.

The work consisted mostly of making Wasserman tests and conducting examinations for the presence of *B. typhosus*. The summary of examinations made is as follows:

Wasserman tests	1,403
Feces for the presence of *B. typhosus*	126
Feces for the presence of *B. dysenteriæ*	1
Urine for the presence of *B. typhosus*	2
Urine analyses	3
Blood cultures	4
Widal test	10
Blood for mercurialized serum	10
Urine for tuberculosis (guinea pigs) inoculation	2
Bloody pus for culture, tuberculosis (guinea pig) inoculation	1
Specimens for culture and guinea-pig inoculation for tuberculosis	6
Sputum for mixed vaccine	2
Culture for organism identification	3
Meningitis examinations	59
Other examinations	21

Throughout the year the laboratory conducted the work of examining samples of water from the sources of supply of all the interstate carriers in the States of California and Nevada. This work is more fully set forth in the report of the Interstate Sanitary District of the Pacific.

On December 1, 1916, the Federal laboratory, originally established for work in connection with plague operations, became the Interstate Sanitary Laboratory of the Pacific. For convenience the work of the laboratory has been set forth under plague-suppressive measures, except such functions as are strictly those pertaining to the Interstate Sanitary District of the Pacific.

PLAGUE SUPPRESSIVE MEASURES AT SEATTLE, WASH.

The Public Health Service continues to exercise supervision over all plague suppressive and plague preventive measures on Puget Sound, the work being in charge of Surg. B. J. Lloyd.

History of plague incidence in Seattle.—It will be recalled that plague first manifested itself at Seattle in October, 1907, a total of seven human cases having been reported at that time. Later, in December, 1913, a death occurred which was suspicious of septicemic

plague, but verification of the diagnosis was not possible on account of the body having been embalmed. The first infected rat was discovered within a month of the outbreak of human cases, namely, on November 7, 1907, and during the succeeding year other infected rodents were obtained. There then followed several breaks in the continuity of infected rodents discovered until the fiscal year 1916, when three plague rats were reported. No further infection was found until March, 1917, when three plague rats were discovered about the same time and all at a focus which had previously yielded plague infection. These were the only plague rats found in Seattle during the fiscal year just closed.

History of plague measures.—During a part of the fiscal year ending June 30, 1908, plague suppressive measures in Seattle were under the direct supervision of the Public Health Service, but when human cases ceased to occur the work against the disease in rodents was continued by the city health department. A joint laboratory, city and Federal, having been established, the service furnished the greater part of the equipment and the services of a bacteriologist trained in the diagnosis of plague, while the city maintained the laboratory, providing helpers and supervising the necessary trappers. This plan continued until the marked recrudescence in rodent plague, in the latter part of the calendar year 1913, when it became necessary to augment the force of trappers, which had previously been reduced, to 25. By mutual agreement the supervision of this force was transferred to the Public Health Service, and 5 trained rodentologists were brought by the service from San Francisco to have the immediate direction of the 25 men furnished by the city of Seattle. Immediately upon the recrudescence in question maritime measures, consisting of successive fumigation of vessels, fending and rat guarding, and regular inspections, were inaugurated to prevent the spread of the disease to other ports, these measures likewise being made applicable to vessels engaged in intrastate traffic. At the present time fumigation is no longer required on account of plague conditions in Seattle, but is performed from time to time on local vessels when it is found that they are becoming rat infested. Fumigation of vessels from plague infected ports is performed as a routine measure upon request of the United States quarantine officer at Port Townsend. Fending-off and rat-guarding on all vessels was continued up to and including a part of the present fiscal year, when, upon the recommendation of the officer in charge, concurred in by the city and State health authorities, fending and guarding were limited to vessels from plague-infected ports.

In January, 1914, upon the urgent injunction of the bureau, the examination of the bodies of persons who had died of an acute illness lasting less than seven days was agreed to by the city and State health authorities. Undertakers were accordingly enjoined from embalming dead bodies in such cases until released by an officer of the Public Health Service. This measure was continued until the present fiscal year when, by agreement with this bureau, it has been limited to the bodies of persons dying from septicemia (or "blood poisoning"), pneumonia, and cases which might be suspicious of plague.

In March, 1914, the entire work of plague suppression and prevention was transferred to the Public Health Service, the city fur-

nishing inspectors, trappers, traps, bait, transportation, etc., the service providing the necessary officers and employees for supervising the work, and continuing the services of a bacteriologist in connection with the examination of rodents and of suspicious cases. This arrangement has been satisfactorily continued and is still in operation at the present time, there having been a gradual reduction in force to eight city trappers and two Federal inspectors, the latter having numerous other duties.

Present operations.—Shortly after the work was turned over to the Public Health Service the city council passed, upon the recommendation of the service, an ordinance requiring the rat proofing of all new buildings and all buildings undergoing repairs to the value of 40 per cent of the building being repaired. This rat proofing is either by elevation (18 inches), or by both concrete foundation walls and concrete-floor areas. Immediately after the passing of this ordinance the plague work on Puget Sound was reorganized, with the following objectives in view:

(*a*) The prevention of the introduction of plague from other ports (continued from previous plan).

(*b*) Trapping and poisoning operations, including the collection of dead rats (continuation).

(*c*) Laboratory examination of rodents and suspicious cases (continuation).

(*d*) Educational work by means of lectures, illustrated and otherwise, and by mailing circular letters to persons who make complaints about rats.

(*e*) Intensive trapping on the part of residents in given districts (rat-drive campaign).

(*f*) Trapping operations in cities outside of Seattle.

(*g*) The extermination of existing foci in Seattle (continued from previous plans, but reinforced).

(*h*) The rat proofing of buildings in cities outside of Seattle.

(*i*) The rat proofing of buildings in Seattle.

(*j*) The maintaining of the full cooperation of State and local authorities.

Two of these measures deserve more than passing mention. The extermination of existing foci is pressed hard whenever a plague-infected rat is found. Sometimes this means the razing of an old building, sometimes it is the tearing up of wooden floors and replacing them with concrete, the tearing out of double walls and ceilings, covering with metal lathing, double-layered floors reinforced by wire netting, etc. This work is laid out jointly by the city health department and the Public Health Service and is pursued quietly but relentlessly with at present very little opposition on the part of property owners on whom the expense, which is often considerable, falls.

The rat proofing of new buildings and of buildings undergoing extensive repairs is supervised by the service. A notice of every permit for a new building and for repairs is filed, and a copy of the rat-proofing ordinance is mailed to the owner (or agent), and the contractor. Subsequently, the city inspectors, acting under service supervision, visit these places as often as may be necessary to see that the ordinance is complied with. All restaurant permits are

referred to headquarters, these places to be visited and rat proofing required as a routine measure, regardless of whether they come under this particular ordinance or not.

Trapping operations have been carried on from time to time by the service in Tacoma, Bellingham, and Everett. Everett was the first city on Puget Sound, outside of Seattle, to pass the rat-proofing ordinance (the same as the Seattle ordinance), and her example was subsequently followed by Tacoma. This work was inaugurated in Everett and Tacoma by the service and supervised for a time, but on account of a lack of funds it was later given over to the local authorities in these two cities, the work being discontinued at Everett on December 7, 1916, and at Tacoma on February 15, 1917.

SUMMARY OF PLAGUE SUPPRESSIVE MEASURES AT SEATTLE, WASH.

New buildings inspected	1,601
New buildings reinspected	779
Basements concreted, new buildings, (749,022 square feet)	629
Floors concreted, new buildings (1,071,020 square feet)	456
Yards, etc., concreted, new buildings (87,225 square feet)	228
Sidewalks concreted (square feet)	438,659
Total concrete laid, new structures (square feet)	2,345,926
New buildings elevated	133
New premises rat proofed, concrete	1,085
Old buildings inspected	166
Premises rat proofed, concrete, old buildings (169,815 square feet)	121
Floors concreted, old buildings	121
Premises otherwise rat proofed, old buildings	25
Openings screened, old buildings	238
Rat holes cemented, old buildings	271
Wooden floors removed, old buildings	131
Doors rat proofed, old buildings	2
Wire screening used (square feet)	19,590
Buildings razed	103

Water front.

Inspection and reinspection of vessels and histories recorded	703
Vessels fumigated	109
Sulphur used (pounds)	114,120
New rat guards installed	364
Defective rat guards repaired	771
Fumigation certificates issued	109
Canal certificates issued	7
Port sanitary statements	2,147

Laboratory operations.

Dead rodents received	519
Rodents trapped and killed	16,489
Rodents recovered after fumigation	1,280
Total	18,288
Rodents examined for plague infection	12,891
Rodents proven plague infected	3
Poison distributed (pounds)	942
Bodies examined for plague infection	154
Bodies found plague infected	0

Classification of rodents.

Mus rattus	1,677
Mus alexandrinus	4,488
Mus norvegicus	8,768
Mus musculus	3,352
Unclassified	3

Miscellaneous.

Rat-proofing notices sent to contractors	734
Letters sent in answer to rat complaints	159
Lectures delivered on sanitary subjects	42

PLAGUE PREVENTIVE MEASURES AT TACOMA, WASH.

New buildings inspected	71
New buildings reinspected	51
New buildings rat-proofed by concrete foundations	35
New buildings rat-proofed by elevation	35
New buildings, basements concreted (6,133 square feet)	9
New buildings, yards, etc., concreted (829 square feet)	4
Total concrete laid (square feet)	6,962
Old buildings, floors removed (3,310 square feet)	2

Classification of Rodents.

Mus rattus	138
Mus norvegicus	3,426
Mus alexandrinus	181
Mus musculus	29
Total	3,774
Rodents examined for plague infection	3,395
Rodents proven plague infected	0

PLAGUE PREVENTIVE MEASURES AT EVERETT, WASH.

New buildings inspected	58
New buildings reinspected	131
New buildings rat-proofed by concrete foundations	23
New buildings rat-proofed by elevation	34
New buildings, basements concreted (19,985 square feet)	20
New buildings, floors concreted (2,934 square feet)	7
New buildings, yards, etc., concreted (5,852 square feet)	19
Total concrete laid (square feet)	28,771

Classification of Rodents.

Mus rattus	1
Mus norvegicus	1,410
Mus alexandrinus	7
Mus musculus	75
Total	1,493
Rodents examined for plague infection	1,357
Rodents proven plague infected	0

ROCKY MOUNTAIN SPOTTED FEVER INVESTIGATION AND ERADICATION.

Field investigation.—The investigation of the distribution of Rocky Mountain spotted fever was continued during the spring and early summer of 1917 by Surg. L. D. Fricks, through personal investigation of cases reported, by correspondence with the different health officials throughout the Rocky Mountain region, and through the submission of reports of cases occurring within the respective States.

In southeastern Montana where there occurred a serious outbreak of the disease in 1915, with 22 reported cases, in territory previously considered uninfected and the greater part of which was supposed to be free from tick infestation, no increase in the number of cases

or dissemination of the infection occurred, either in 1916 or 1917. As a matter of fact, although a campaign of tick eradication was not undertaken in this territory at any time, a considerable decrease in the number of cases was observed during the past two years. The possibility that this extension into southeastern Montana was accomplished, in part at least, by the interstate movements of live stock, and particularly by the bringing into Miles City each month of several hundred horses from near-by States, was pointed out in a previous report. A wide variation in tick infestation in different years has been observed throughout this section and it is probable that this natural variation in the abundance of ticks has influenced the spread of the infection.

A survey of Modoc and Lassen Counties, in northeastern California, was made during the year by the health authorities of that State in order to determine the extent of spotted-fever infection in those areas. The survey showed that the majority of the cases occurring in the past had not been reported. The same condition is probably true for the greater number of the existent foci of infection, although the Bitter Root Valley is a notable exception to this statement. The health authorities of California during the year forwarded to the Victor, Mont., laboratory a strain of spotted fever in guinea pigs inoculated from a human case infected in Ventura County. This infection was first suspected of being typhus fever, but, when tested against the Bitter Root strain of spotted-fever virus in laboratory animals, it was shown to be the same. No case of Rocky Mountain spotted fever had been previously reported from this section of the State of California.

In the following table is given the number of cases and deaths from Rocky Mountain spotted fever, reported by States, during the season of 1916:

State.	Cases.	Deaths.	State.	Cases.	Deaths.
California	11	0	Utah	29	0
Colorado	4	1	Washington	3	0
Idaho	151	11	Wyoming	26	6
Montana	19	6			
Nevada	20	2	Total	289	30
Oregon	26	4			

This is a great reduction in the number of cases from that reported the previous year and probably is due more to incomplete returns than to any abatement of the disease.

Eradication.—Efforts to eradicate Rocky Mountain spotted fever from the Bitter Root Valley, Mont., were continued by the Public Health Service for the seventh consecutive year. No changes were made in the methods of eradication first adopted by the service, i. e., (1) Education, (2) securing of proper grazing laws, (3) tick eradication, primarily by small animal destruction and sheep grazing. In the seven years that this eradicative campaign has been carried on in the Bitter Root Valley the seasonal incidence has been reduced from more than 30 to 5. How much of this decrease has been due to education of the people concerning the danger of tick bites and how much to tick eradication is difficult to say, but undoubtedly

both have played a part in the gradual reduction of cases occurring in that section.

The spotted-fever zone of the Bitter Root Valley is a narrow strip of generally uncultivated land which lies just outside of the grain and hay fields on the west side of the valley. The spotted-fever problem is to graze this strip in such a manner as to bring about a continual decrease in tick infestation.

Constant effort has been made for several years past to secure the enactment by the State legislature of proper grazing laws for this district and there is good reason to believe that at last this effort will meet with success. A bill of this character was prepared during the past year and its passage was encouraged by the State health officer; it was also given the active support of the State board of entomology. Broadly, the bill provides for the restriction of horse and cattle grazing, the encouragement of sheep grazing, and the exercise of control over both in spotted-fever territory by the State board of entomology. With the passage of this law it will be possible to prevent the breeding of ticks on domestic animals, something that has never been accomplished in the Bitter Root Valley through dipping operations. On the assurance that this bill would be enacted into law, the Public Health Service made preparations to withdraw from the active campaign of spotted fever eradication in Montana, leaving the work entirely to the State authorities.

Pending the passage of a grazing law the dipping of domestic animals was continued in the Bitter Root Valley as heretofore. This measure has always been considered by the service as a temporary expedient only, of doubtful value, to be superseded as soon as possible by an adequate grazing law. During the past season the dipping of domestic animals at the three dipping vats which have been operated in the valley for several years, was conducted under very adverse weather conditions. Because of the cold weather none of the vats was placed in operation before April 15, and following this the dippings were frequently interrupted for the same reason. The following is a list of the live stock, exclusive of sheep, in the three dipping districts, comprising about 60 square miles, which were either dipped, hand picked, or inspected for ticks periodically during the tick season:

Victor district:
Cattle, range 382, milk 78; total, 460.
Horses, range 32, work 20; total, 52.
Hamilton district:
Cattle, range 187, milk 116; total, 303.
Horses, range 60, work 28; total, 88.
Gold Creek district:
Cattle, range 251, milk 84; total, 335.
Horses, range 31, work 23; total, 54.

Rodent destruction.—Inasmuch as the immature forms of the spotted fever tick are found only on small rodents in the Bitter Root Valley the destruction of these pests has always been considered by the Public Health Service as a valuable procedure in tick eradication. The methods employed in the destruction of rodents during the past season have been continued as heretofore and were directed primarily against the ground squirrel, *Citellus columbianus*. The methods advocated are (1) Poisoning with strychnine; (2) shooting; (3) trapping.

One thousand six hundred pounds of hulled oats freshly coated with starch and strychnine paste were distributed in the three districts early in the season and the distribution of poison grain to the west side ranchers was extended the entire length of the valley to the south. Sixty thousand .22 calibre cartridges were expended, approximately half of these by the different poison squads and the remainder by the west-side ranchers, to whom they were given. The ranchers were also urged to use a moderate number of small steel traps judiciously placed around gardens, grain, and hay fields throughout the squirrel season. In addition to these measures a law providing for the destruction of ground squirrels and other rodents was passed by the last State legislature and efforts were made to cooperate with the county commissioners of Ravalli County in enforcing this provision.

Sheep grazing.—Any practical plan of tick eradication as a means of controlling Rocky Mountain spotted fever must take into consideration the fact that the tick-infested territory must and should be used from year to year for agricultural or grazing purposes. Tick eradication in any western community can not be completely accomplished in one or two seasons and then left as a finished undertaking, except where all of the infected territory is put under fence and placed in cultivation. On land which is useful for grazing purposes only, the fight against tick infestation must be carried on persistently from year to year. When this grazing land is in close proximity to the settlements, as it is in the Bitter Root Valley, the problem of tick infestation and Rocky Mountain spotted fever infection becomes most grave. For these reasons no campaign of tick eradication which does not include the employment of sheep grazing in some form can be said to be complete where grazing lands are involved. Sheep lend themselves to the grazing restrictions which are necessary for tick control much better than do cattle or horses; in fact sheep in small bands naturally graze in a manner adapted to tick eradication.

Sheep grazing experiments were continued during the past season along two main lines, as follows: First. The employment of large bands of sheep to be used mechanically in sweeping the ticks away from the settlements toward the mountains. Second. The grazing of sheep in small bands over lightly infected lands close around the ranches.

Through the cooperation of the Forest Service officials 45,000 sheep were introduced this season into the Bitter Root Valley. These sheep were all placed on the west side of the valley and it was intended that they should be grazed away from the settlements up through the passes of the Bitter Root Mountains, taking a large percentage of the valley tick infestation along with them. The introduction of these sheep was a result of several seasons' effort, and if sheep grazing upon this scale can be placed on a business basis in the valley, so that the movement will be continued from year to year, it is expected that it will go far toward clearing up the spotted-fever situation.

A band of 500 sheep was secured for experimental use and grazed first in a near-by tick-free irrigated pasture, then for 10 days over adjacent tick-infested territory, and finally back to the pasture for

observation. The purpose of this experiment was to show that by watching the tick infestation closely on a small band, the sheep might be grazed over territory showing a high degree of infestation, provided they are shifted as often as every 10 days to nearly tick-free pasture. In addition to these experiments the west-side ranchers were encouraged to secure small bands of sheep, which they have done in so far as their means will permit.

The entire spotted fever situation, so far as the Bitter Root Valley is concerned, appears to be much more satisfactory than ever before. The adoption of proper grazing methods, the realization of the inadequacy of dipping domestic animals, the continuation of small animal destruction, and the contemplated enactment of suitable legislation, have all served to place the work of tick eradication and the elimination of spotted fever on a more scientific basis. There is reason to believe that if these procedures can be continued as outlined the ultimate control of spotted fever infection in this district will be effected.

MEASURES FOR THE PREVENTION OF THE INTERSTATE SPREAD OF TYPHUS FEVER.

OPERATIONS AT EL PASO, TEX.

As an additional precautionary measure to prevent the spread of typhus fever and other diseases from border points to places within the United States, and to discourage in large measure the interstate travel of Mexicans who had entered the country clandestinely, an order was issued January 20, 1917, to all transportation companies operating trains out of the city of El Paso, directing that no Mexicans of the laboring class or their families were to be furnished transportation unless they were provided with a service certificate showing that they had been deloused, bathed, and vaccinated, and that their clothing and baggage had been disinfected.

All railroad companies have given valuable cooperation in the enforcement of this order. Through the operation of this measure the interstate spread of typhus has been largely controlled and the requirement has also been of material assistance in enforcing quarantine regulations at the port of entry, undoubtedly tending to diminish clandestine crossing and causing immigrants to present themselves at the proper station for treatment.

After January 2, 1917, all Mexicans requiring quarantine treatment were disinfected at the El Paso plant before leaving for interstate points, and since this date no cases of typhus have been reported elsewhere in the United States that could be traced to El Paso or Mexico through entry at El Paso. January, February, and March are months especially favorable for the spread of typhus, so it would appear that the measures adopted were quite effective in preventing the dissemination of the disease. This is borne out by the fact that prior to the establishment of the disinfecting plant and before any control was exercised over interstate travel a number of cases were reported in California and Colorado which had their source of infection traced to El Paso.

During the latter part of the last fiscal year it was suggested to the El Paso authorities that they make an effort to eradicate local typhus

infection, this suggestion being advanced in response to a request for a nonintercourse quarantine with Mexico. At that time service assistance toward the accomplishment of this end was offered. Later, in January, 1917, the city health officer of El Paso died of typhus fever contracted while performing the duties of his office. Immediately after this death the mayor and the city council requested that Asst. Surg. J. W. Tappan be granted permission to accept the position of health officers of the city. In compliance with this request this officer was granted leave without pay and took over the sanitary work for El Paso on January 15.

Under the administration of this officer a general plan to eliminate louse infestation was commenced and carried out with considerable success. The city health department secured a motor-driven omnibus, and an inspector of the department of health made frequent trips each day with this vehicle to crowded Mexican tenements, conveying louse-infested persons and their personal effects to the service disinfecting plant, where they were deloused. This measure resulted in a very marked improvement, not only from the actual number of persons treated at the plant, but in stimulating all other Mexicans to bathe and boil their clothing so as to avoid being carried away for official delousing.

During the latter part of January, the mayor and city council made an official request for assistance in eradicating typhus-fever infection. It was estimated by the officer in charge that the necessary work would require an expenditure of approximately $10,000. It was impossible to grant this request on account of insufficient funds, but Asst. Surg. T. C. Galloway was detailed to assist in sanitating El Paso.

Upon the arrival of Dr. Galloway from Colorado, where he had been on typhus epidemic duty, a sanitary survey of El Paso was inaugurated under the supervision of the officer in charge, and with the cooperation of the city health officer and his employees. The results of this survey disclosed housing conditions that were highly conducive to the spread of typhus fever, and clearly brought forth the necessity for public baths and laundries in El Paso where the peon class of Mexicans might bathe and wash their clothing. With a view to correcting the crowded conditions in tenement and cheap lodging houses, ordinances were prepared and recommended to the municipal council for enactment. These ordinances were passed on April 5, 1917, and are being enforced at the present time, so that the conditions under which the peon class live have been markedly improved.

Plans for a suitable municipal free bathhouse and laundry were submitted to the city council, with an estimate of the cost of operation, and the probable number of persons that would avail themselves of these facilities. Considerable local support for the project was obtained and a site for the building selected. Both the site and the building could have been secured without expense to the city, through public-spirited citizens, but it was found that the unsatisfactory state of the city finances would not permit the appropriation for maintenance and operation at that time. With the support of a local paper, a sanitary educational propaganda was carried on which will not only make the building of such a plant almost certain, as soon as the tax levy will permit the expenditure, but which also accomplished much

good in advising the public in regard to the deplorable conditions which existed and to create a desire for their improvement.

In addition to the sanitary work in connection with typhus eradication, Asst. Surg. Tappan while city health officer secured amendments to the old milk ordinances, which have greatly improved the milk situation in El Paso and have had some effect in reducing infant morbidity. Upon completion of his duty as city health officer the work accomplished was made the subject of a commendatory letter from the mayor of the city.

OPERATIONS IN COLORADO.

During the latter part of November and in December, 1916, several cases of typhus fever, which had evidently been imported from Mexico, occurred in the vicinity of La Junta, Colo. The State board of health requested the cooperation of the service in limiting the further spread of the disease, and Asst. Surg. T. C. Galloway, jr., was detached from the Laredo station and ordered to Colorado for that purpose. The epidemiology of the cases which had occurred was investigated and the measures suggested and enforced apparently controled the disease, although the operation of the service plant at El Paso made it more difficult for vermin-infested Mexicans to reach Colorado points.

Nine cases of frank typhus and two other suspicious cases were found to have occurred—all in Mexicans, except one known case and and one suspicious case in Americans. Five of these cases arrived from Mexico via El Paso during the incubation stage of their illness: the others were secondary, due to nonrecognition or failure to isolate the primary cases.

Conferences were held with State and county health officials, medical representatives of the various railroads in Colorado, and the beet-sugar companies. The history and diagnosis of typhus were discussed and the method of its control outlined, measures being suggested for local application. All were interested and concerned and gave their willing, active cooperation, making it unnecessary to propose any further quarantine restrictions. A circular letter of information and suggestions was also prepared, with the cooperation and assistance of the secretary of the State board of health, and this was placed in the hands of those interested.

OPERATIONS AT FORT MADISON, IOWA.

Owing to an outbreak of typhus fever occurring among Mexican railroad laborers at Fort Madison, Iowa, requests were received from the State health officer of Iowa and the chief surgeon of the Chicago, Rock Island & Pacific Railway relative to the detail of an officer of the service for the purpose of confirming the diagnosis of the disease and offering recommendations as to the measures necessary for the prevention of its further extension. Accordingly Surg. M. J. White was directed December 28, 1916, to confer with the medical authorities in question and to make such inspection of the railway camps in various States as was required. It was ascertained that the outbreak of typhus originated among Mexicans who had recently arrived from across the border, and that their habits of life and lack of cleanliness favored the further dissemination of the disease.

Specific measures were outlined to the authorities for improving the sanitary environment of the workmen, and for the systematic delousing of all laborers of the class involved. Following the adoption of these measures no additional cases developed.

SANITARY, EDUCATIONAL, AND RELIEF WORK IN ALASKA.

The act of Congress making annual appropriations for the sundry civil expenses of the Government directs that the medical and sanitary relief of the natives of Alaska shall be under the direction of the Secretary of the Interior, with the advice and cooperation of the Public Health Service. Under this provision Passed Asst. Surg. Emil Krulish was detailed in 1912 for duty in Alaska to study the diseases and sanitary conditions in the native settlements in order to intelligently and economically inaugurate measures for relief. These studies were carried on throughout a period of approximately three years, and all sections of Alaska were visited, some time being spent in each native community. These surveys indicated that the native population was decreasing at an alarming rate, chiefly from tuberculosis; and that venereal diseases and eye affections, including trachoma, were very prevalent in the Territory. The homes with but few exceptions were found to be insanitary and responsible in a great measure for much of the illness and high death rate. The remedy advocated to improve these conditions and to check the ravages of these diseases was the establishment of well-equipped hospitals, the employment of competent physicians and nurses, the isolation of the sick, and the education of the natives in hygiene and sanitation.

The area of the Territory of Alaska is one-fifth that of the United States, and the transportation facilities are inadequate and expensive; consequently the erection of one central hospital was deemed impracticable. The difficulties encountered in reaching even a small percentage of the population can be appreciated when one considers the vast territory over which the native population is scattered, in groups rarely exceeding 200 in number. The establishment of a chain of small hospitals along the coast and on the Yukon River at points most convenient to the greatest number of natives was therefore recommended, and in estimates submitted to Congress the officer in charge indicated the places at which hospitals would serve the greatest number of people at the least expense. Upon the completion of the surveys of the native villages in 1915, the station of the officer in charge was changed from Juneau, Alaska, to Seattle, Wash., in order that he should be in closer and more direct communication with the officials of the Bureau of Education in charge of the Alaska school service, whose headquarters are at Seattle, thereby facilitating the direction and supervision of the proposed medical service.

Throughout the fiscal year the officials of the Bureau of Education have been advised on matters pertaining to hygiene, sanitation, erection and maintenance of the several hospitals, and the administration of the medical service in general. The requisitions for medical supplies for hospitals and for the 70 schools which are the relief stations of the service were prepared as usual; applicants for the position of physician or nurse were examined and the names of those found qualified submitted to the commissioner for appointment.

The annual estimates for medical service were also prepared and submitted to Congress.

The plans for the proposed hospital for southwestern Alaska on the Kuskokwim River were drafted by the officer in charge, who likewise selected the fixtures, furniture, and the complete equipment of the institution. This hospital, which is now nearing completion, will accommodate 12 patients, in addition to the living quarters for the staff, and a camp for tuberculous patients will be established in the near future in connection therewith.

The new 22-bed hospital for southeastern Alaska, at Juneau, which was completed and opened the latter part of last year, has been taxed to its capacity, and it has been necessary to carry a waiting list of patients desiring surgical operations. The records for the last nine months of the year indicate that 164 patients were treated in the hospital and received 3,476 days' hospital care. Forty-six major operations were performed, including 32 laparotomies, in addition to many minor and major operations on the eye. In the out-patient department 1,750 patients received attention. At the beginning of the fiscal year, upon the request of the Commissioner of Education, the officer in charge made a special trip to Juneau to inspect this hospital and assist in its organization.

During the year the Alaska medical service operated 5 hospitals and employed 9 physicians and 10 nurses. Two of the institutions are modern and well worthy of the name of hospital, but the other 3 are only improvised hospitals and are maintained in school buildings. The first appropriation of $25,000 for medical relief in Alaska was granted by Congress in 1915. The sum for the following year was increased to $50,000, while the appropriation for this year is $62,500. Although this is inadequate to the demand, it is encouraging to note that Congress appreciates the need and importance of this work by increasing the appropriation each year.

With the exception of an epidemic of measles, the reports of the teachers in the Alaska school service indicate that during the past year the health of the natives has been exceptionally good, and that the sanitary conditions in the villages and homes are improving. The morbidity and mortality statistics continue to show a marked decline over previous years. The elimination of the common towel and drinking cup from the schools, the efforts of the teachers in teaching hygiene and sanitation in addition to the regular classroom studies, and the increase in medical appropriations are responsible for these encouraging reports. The epidemic of measles mentioned occurred during the winter in all the villages in southeastern Alaska. Approximately 300 cases of the disease were reported.

A special lecture on the cause and prevention of tuberculosis, adapted to conditions in Alaska, was prepared at the request of the Commissioner of Education. This is to be used by the teachers in combating the white plague. A special set of slides was also prepared from views taken in Alaska to illustrate this lecture, inasmuch as the customary lectures and slides were found to be entirely foreign to conditions in Alaska.

The Bureau of Education, with the aid and cooperation of the Public Health Service, has demonstrated its ability to economically care for the natives' needs, and it is hoped that Congress will make it possible to establish small hospitals in other sections of the Terri-

tory. Tuberculosis sanitariums are especially needed, for tuberculosis is the most prevalent disease from which the natives suffer.

INTERSTATE QUARANTINE REGULATIONS.

In order to place the administration of the Interstate Quarantine Regulations upon a more effective basis and for the convenience and closer cooperation of State authorities, an order was approved and promulgated by the Secretary of the Treasury, under date of January 12, 1917, redistricting the interstate sanitary districts in such a manner that no single State would be in more than one district. As arranged the revised sanitary districts are as follows:

District of the North Atlantic: Maine, New Hampshire, Massachusetts, Vermont, Rhode Island, and Connecticut.

District of the Mid-Atlantic: New York, Pennsylvania, New Jersey, Delaware, Maryland. and the District of Columbia.

District of the Ohio: Virginia, North Carolina, West Virginia, Kentucky, and Tennessee.

District of the South Atlantic: South Carolina, Georgia, and Florida.

District of the Great Lakes: Ohio, Michigan, Indiana, Illinois, Wisconsin, and Minnesota, together with jurisdiction over vessels operating on all of the Great Lakes and the St. Lawrence River, and on the Mississippi River and its tributaries north of Cairo, Ill.. and the Ohio River and its tributaries between Cairo, Ill., and Pittsburgh, Pa.

District of the Upper Missouri: Montana, North Dakota, and South Dakota.

District of the Missouri: Nebraska, Iowa, Kansas, and Missouri.

District of the Gulf: Oklahoma, Arkansas, Louisiana, Alabama, and Mississippi.

District of the Rocky Mountains: Utah, Wyoming, and Colorado.

District of the Rio Grande: Arizona. New Mexico, and Texas.

District of the North Pacific: Washington, Oregon, and Idaho.

District of the Pacific: California and Nevada.

AMENDMENTS AND ADDITIONS TO INTERSTATE QUARANTINE REGULATIONS.

During the year three amendments and two additional sections to the Interstate Quarantine Regulations have been promulgated:

WATER FOR DRINKING OR CULINARY PURPOSES PROVIDED ON CARS AND VESSELS BY INTERSTATE CARRIERS.

(Amendment No. 1 to Interstate Quarantine Regulations, 1916.)

Public Health Service.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, February 12, 1917.

To medical officers of the U. S. Public Health Service, State and local health authorities, and others concerned:

The following amendment is hereby made to the Interstate Quarantine Regulations promulgated by this department January 15, 1916, said amend-

ment and regulations being in accordance with the act of Congress approved February 15, 1893.

Section 13, Interstate Quarantine Regulations, is hereby amended to read as follows:

"SEC. 13. Water for drinking or culinary purposes provided on any car, vessel, vehicle, or other conveyance, by any person, firm, or corporation while engaged in interstate traffic, shall conform to the bacteriological standard for drinking water, as promulgated by the Secretary of the Treasury on October 21, 1914, and shall not be from a supply that is exposed to contamination.

"(*a*) The person, firm, or corporation before mentioned shall procure from the interstate sanitary officer, or the State or other health authority within whose jurisdiction the water is obtained, a certificate showing that the water supply conforms to the foregoing requirements. The aforesaid certificates shall be executed semiannually, or as often as the Surgeon General of the United States Public Health Service may direct, and shall be filed with the United States Public Health Service.

"(*b*) Ice used for cooling such water shall be clear natural ice, ice made from distilled water, or ice made from water certified as aforesaid, and before the ice is placed in the water it shall be first carefully washed with water of known safety, and handled in such manner as to prevent its becoming contaminated by the organisms of infectious or contagious diseases: *Provided,* That the foregoing shall not apply to ice which does not come in contact with the water which is to be cooled.

"(*c*) Water containers shall be cleansed at least once in each week that they are in operation.

"(*d*) The provisions of this section shall also apply to water provided for drinking or culinary purposes on vessels plying between foreign ports on or near the frontiers of the United States, and adjacent ports in the United States, in accordance with article 4, Foreign Quarantine Regulations of the United States, promulgated October 20, 1910, and amendments thereto.

"W. G. MCADOO, *Secretary.*"

The foregoing amendment requires that only water used for drinking or culinary purposes shall be certified in the manner indicated, and that this provision shall apply not only to common carriers but to persons, firms, and corporations engaged in interstate traffic, it having been ascertained that certain of these firms were not common carriers under the strict sense of the term. The section further provides that in addition to the bacteriological analysis of any supply from which water is derived for use on conveyances engaged in interstate traffic a sanitary survey of the watershed from which such water is obtained shall be made to determine whether the supply is subject to contamination, thus placing the work upon a more scientific basis. It has been found that certain supplies which conformed at stated intervals to the bacteriological standard were, nevertheless, subject to dangerous pollution which might occur and produce disease in the interim of examinations. The final paragraph of the section, making the requirements apply to vessels plying between foreign ports on or near the frontiers of the United States and adjacent ports of the United States, was appended in order to include in its provisions vessels navigating the Great Lakes and the St. Lawrence River, which carry passengers destined for interstate traffic in this country, as is prescribed for United States vessels in the same area. This not only protects passengers but obviates unfair restrictions upon United States vessels in comparison with those under other flags.

WATER FOR DRINKING PURPOSES PROVIDED AT STATIONS BY INTERSTATE CARRIERS.

(Amendment No. 2 to Interstate Quarantine Regulations, 1916.)

Public Health Service.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, February 12, 1917.

To medical officers of the U. S. Public Health Service, State and local health authorities, and others concerned:

The following amendment is hereby made to the Interstate Quarantine Regulations promulgated by this department January 15, 1916, said amendment and regulations being in accordance with the act of Congress approved February 15, 1893.

Section 14, Interstate Quarantine Regulations, is hereby amended to read as follows:

"SEC. 14. No person, firm, or corporation engaging in interstate traffic shall maintain or permit to be maintained at or near any station or other ordinary stopping place over which the aforesaid person, firm, or corporation has control, any tank, cistern, receptacle, hydrant, pump, well, stream, brook, pool, ditch, or other place or article containing water which may be contaminated by organisms likely to cause a contagious or infectious disease, and which water may conveniently be obtained by employees of the aforesaid person, firm, or corporation, or by the general public engaging in interstate traffic, unless approved signs, prohibiting the use of such water for drinking purposes, be properly placed and properly maintained."

W. G. MCADOO, *Secretary.*

The object of this amendment is to protect employees, passengers, and others from unknowingly consuming contaminated water. It was found that nonpotable water provided for commercial uses frequently existed in proximity to safe supplies and without placarding persons were quite as apt to drink from the polluted source as from the other.

INTERSTATE TRANSPORTATION OF PERSONS HAVING CONTAGIOUS OR INFECTIOUS DISEASES.

(Amendment No. 3 to Interstate Quarantine Regulations, 1916.)

Public Health Service.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, February 12, 1917.

To medical officers of the U. S. Public Health Service, State and local health authorities, and others concerned:

The following amendment is hereby made to the Interstate Quarantine Regulations promulgated by this department January 15, 1916, said amendment and regulations being in accordance with the act of Congress approved February 15, 1893.

Section 18, Interstate Quarantine Regulations, is hereby amended to read as follows:

"SEC. 18. No person knowing that he is in the communicable stage of any of the diseases enumerated in section 1 shall travel on any car, vessel, vehicle, or other conveyance engaging in interstate traffic, except as hereinafter provided, nor shall any parent, guardian, physician, nurse, or other person allow or procure such transportation for any minor, ward, patient, or other person under his charge."

W. G. MCADOO, *Secretary.*

This amendment places the responsibility regarding travel of persons suffering from communicable disease upon the affected passenger or his agent, while in no sense relieving the railroad of the responsi-

bility of knowingly accepting such passengers, thus providing an additional safeguard to the traveling public.

SANITATION OF CAMPS OCCUPIED BY MIGRATORY WORKERS.

(Amendment No. 4 to Interstate Quarantine Regulations, 1916.)

Public Health Service.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, February 12, 1917.

To medical officers of the U. S. Public Health Service, State and local health authorities, and others concerned:

The following addition is hereby made to the Interstate Quarantine Regulations promulgated by this department January 15, 1916, said addition and regulations being in accordance with the act of Congress approved February 15, 1893.

The following regulation, section 37, is hereby added to the Interstate Quarantine Regulations:

"SEC. 37. Persons, firms, or corporations maintaining camps of migratory workers shall at all times maintain such camps in a proper sanitary condition and shall take proper measures to maintain the camps so occupied in a vermin-free condition and shall exercise such other precautions as shall prevent the interstate spread of disease from such camps, and the Surgeon General may from time to time detail officers or employees of the United States Public Health Service to make such inspections as shall be necessary for the enforcement of this regulation.

"W. G. MCADOO, *Secretary.*"

The above section was made necessary by the threatening typhus situation and was aimed directly at railway and labor camps where insanitary conditions favoring the development of that disease prevailed. Since the outbreak of typhus fever in Mexico energetic measures have been instituted at border points toward the prevention of the introduction of the infection, but these measures were in large effect rendered nugatory by the fact that conditions conducive to the dissemination of typhus existed in construction camps in our country. Following the promulgation of the above regulation, and as a result of the cooperation of the State boards of health and the railroad companies concerned, the menacing conditions have been materially overcome.

PROHIBITING THE INTERSTATE TRANSPORTATION OF OYSTERS AND CLAMS GROWN OR HANDLED UNDER INSANITARY CONDITIONS.

(Amendment No. 5 to Interstate Quarantine Regulations, 1916.)

Public Health Service.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, February 12, 1917.

To medical officers of the U. S. Public Health Service, State and local health authorities, and others concerned:

The following addition is hereby made to the Interstate Quarantine Regulations promulgated by this department January 15, 1916, said addition and regulations being in accordance with the act of Congress approved February 15, 1893.

The following regulation, section 38, is hereby added to the Interstate Quarantine Regulations:

"SEC. 38. After notification in writing by the proper health authorities, common carriers shall not transport nor accept for transportation in interstate traffic, nor shall any person, firm, or corporation offer for transportation in interstate traffic, any oysters, clams, or other shellfish which have been grown, fattened, or handled in such a way as to render them liable to become agents in the interstate spread of disease, and the Surgeon General of the United States

Public Health Service shall from time to time cause sanitary inspections to be made by officers of the Public Health Service of beds used for growing or fattening oysters, clams, or other shellfish and of shucking houses and other similar places in which oysters, clams, or other shellfish are shucked or otherwise prepared for interstate shipment, and he may forbid the interstate shipment of any such oysters, clams, or other shellfish which are produced or handled in a manner which will render them liable to become agents for the interstate spread of disease."

W. G. McAdoo, *Secretary.*

As a result of the investigations of the pollution of coastal waters, referred to in another section of this report, conditions in reference thereto in certain areas where shellfish were grown or fattened were ascertained to be far from satisfactory, if not actually dangerous, and that food products originating from these polluted sources were frequently responsible for the interstate spread of disease. The purpose of the amendment as promulgated is to grant authority for the inspection of those places where shellfish are grown, fattened, or handled and to prohibit the interstate transportation of these food products when it is found that they are liable to become agents in the transmission of disease. This regulation has already given favorable results and numerous inquiries have been received from shellfish growers concerning the sanitary status of waters in which their products are grown.

Water Supplied by Interstate Carriers.

The certification of supplies from which water is derived for the use of interstate passengers has been continued as heretofore, although the scope of the examination covering these supplies has been considerably broadened. As previously noted sanitary surveys at periodic intervals of the watershed from which supplies are derived were made obligatory, so that under the present regulations entire dependence is not placed upon the results of bacteriological examination in judging of the quality of a given supply. This requirement has tended toward the maintenance of watersheds in a satisfactory condition and has encouraged State and local health authorities in the adoption and enforcement of the necessary provisions for the adequate protection of such sources. In many instances these authorities were already in possession of data relative to the sanitary status of all watersheds under their jurisdiction and exercised precautionary measures for their protection. In such instances the enforcement of the requirement referred to has entailed no additional labor. In other cases expenditure of time and effort has been necessary in surveying and safeguarding these supplies.

Conformatory to the amended regulation requiring sanitary surveys of water supplies as well as bacteriological analyses a new form for the certification of water has been prescribed, affording complete data regarding any given supply. The cooperation necessary on the part of State and municipal health authorities in the securing of these data is more manifest than at any previous time and the response afforded practically every request has been most gratifying. The point should not be overlooked, however, that information concerning the condition of water supplies is a valuable contribution to the records of any health office and frequently has considerable epidemiological significance.

The number of water sources listed from which supplies for interstate carriers are obtained has shown a material reduction during the

year, thus indicating that the securing of water from brooks, wells, and other sources indiscriminately without regard to its quality or the opportunities for contamination is being discouraged. On June 30, 1916, the listed supplies throughout the United States numbered 5,411, while on June 30, 1917, only 4,156 supplies were listed. Of the latter number 3,713, constituting 89.34 per cent, were examined and certified during the year. Of the total number of supplies examined 211 were either found contaminated or not to meet the Treasury Department standard, these supplies representing 5.07 per cent of those in use. In all instances where contamination was discovered the water was either ordered discontinued or provision was made for its purification in an approved and satisfactory manner. The following table indicates by States the number of supplies listed, those examined, and the number found polluted:

Statistics concerning the certification of water provided on cars and vessels by interstate carriers for the fiscal year ending June 30, 1917.

State.	Number of water supplies in use.	Number certified within 12 months.	Per cent certified within 12 months.	Number of supplies found polluted.
Alabama	68	61	89.7	1
Alaska	20	14	70.0	0
Arizona	58	56	96.6	1
Arkansas	82	75	91.5	1
California	119	106	89.1	3
Colorado	72	66	91.7	5
Connecticut	29	29	100.0	1
Delaware	9	9	100.0	0
District of Columbia	10	10	100.0	1
Florida	101	93	89.4	2
Georgia	152	137	90.1	2
Hawaii	3	2	66.7	0
Idaho	34	26	76.5	4
Illinois	142	133	93.7	15
Indiana	138	128	92.8	15
Iowa	108	97	89.8	0
Kansas	117	109	93.2	11
Kentucky	65	56	86.2	10
Louisiana	135	127	94.1	5
Maine	114	114	100.0	1
Maryland	43	34	79.1	4
Massachusetts	64	64	100.0	0
Michigan	158	148	93.7	34
Minnesota	92	74	80.4	27
Mississippi	57	50	87.7	0
Missouri	136	132	97.1	0
Montana	32	30	93.7	5
Nebraska	55	55	100.0	1
Nevada	20	19	95.0	1
New Hampshire	29	29	100.0	0
New Jersey	56	56	100.0	1
New Mexico	22	18	81.8	1
New York	213	191	89.7	5
North Carolina	87	83	95.4	6
North Dakota	38	29	76.3	1
Ohio	176	176	100.0	16
Oklahoma	72	67	92.1	1
Oregon	81	60	74.1	3
Pennsylvania	268	184	68.7	4
Rhode Island	9	9	100.0	1
South Carolina	62	54	87.1	0
South Dakota	41	34	82.9	0
Tennessee	63	54	85.7	1
Texas	260	242	93.1	0
Utah	18	17	94.4	2
Vermont	31	31	100.0	0
Virginia	109	104	95.4	4
Washington	116	77	66.4	4
West Virginia	62	52	83.9	4
Wisconsin	80	68	85.0	7
Wyoming	19	17	89.5	0
Foreign	8	7	87.5	1
Total and average	4,156	3,713	89.34	211

It will be noted from the foregoing table that for 11 States, at some time during the year, certificates were registered covering the entire number of supplies from which water for the use of interstate passengers was derived, while in 28 States more than 90 per cent of the supplies were certified. In comparison with what has been accomplished in previous years, and in view of the fact that hundreds of indiscriminate supplies have been eliminated, this constitutes a remarkably good showing. It should be understood that the report indicates only the number of certificates and not their worth; it is therefore in part misleading as an index of the condition of the water supplies of any particular State. It should be stated in passing, however, that there is good reason to believe that the certificates of examination received during the year have been based upon much more thorough investigation than at any previous time.

The number of supplies found polluted, as shown in the last column, is more or less of an indication of the efficiency of the examining authorities rather than a reflection upon the water supplies of the State. The low percentage of pollutions in Massachusetts can be attributed to the fact that that State has exercised absolute control over all water supplies for many years and has amply protected all public watersheds. The somewhat higher percentage in Ohio is an indication of the thoroughness and completeness of the work performed by the State board of health. The very high percentage of polluted supplies in Minnesota and Michigan is the result of concentrated and systematic effort in the examination of all sources from which water is obtained for interstate passengers, these examinations being carried out in the latter State through the use of the interstate sanitary car "Wyman."

OPERATIONS OF THE SANITARY DISTRICT OF THE GREAT LAKES.

The activities of the sanitary district of the Great Lakes during the year have related in the main to the supervision of the water supplied by interstate carriers for the use of passengers.

In July, 1916, Sanitary Engineer H. P. Letton visited all the State health departments within the district for the purpose of ascertaining what their practice was regarding the certification of water for the use of interstate carriers, their equipment for performing the work, and the difficulties encountered. These visits showed that while certain State boards of health were well prepared to handle the situation, others were not, and in the latter States the work would necessarily devolve, to a large extent, upon the service.

It was deemed advisable, in order to cope with the railway water supply situation to the best advantage, to make sanitary surveys of each source of supply, the data obtained to be filed and to constitute more or less permanent records of the quality of water derived from a particular source. Accordingly, a portable field laboratory was designed and used in the field for several months. This laboratory, while not proving entirely satisfactory, amply demonstrated that more than ordinary bacteriological examinations were required and showed the necessity, in order to form a proper opinion of the quality of a water, of adequate field surveys.

On November 13, 1916, bureau authorization was given for the construction and outfitting of a laboratory car. This car, which is a remodeled Pullman, consists of a completely equipped field laboratory adequately provided with every appliance for routine bacteriological investigation. The car also contains an office, officers' and attendants' sleeping quarters and toilet rooms, and a kitchen and dining room. It is lighted by electricity, which also furnishes energy for driving fans and for heating an incubator. The car was named the interstate sanitary car "Wyman," in commemoration of the late Surg. Gen. Walter Wyman, and was placed in commission March 20, 1917, the personnel consisting of a medical officer in charge, a sanitary engineer, clerk, cook, and laboratory attendant. The first trip of the interstate sanitary car was through the greater part of the State of Michigan. In this State the sources of 81 water supplies were surveyed, the necessary bacteriological examinations performed, and certificates issued covering the quality of these supplies. From Michigan the car proceeded through Wisconsin to Chicago, where it was inspected by the Association of Railway Chief Surgeons. It then traveled through Illinois and Indiana, the same line of investigations being conducted, until called to the Great Lakes Naval Training Station the 12th of June, where it was used in the control of an outbreak of epidemic cerebrospinal meningitis.

In the operation of the car in the investigation of railway water supplies, no attempt is made to take the car to each locality where water is obtained, but it is moved to a central point from which the officers radiate out to near-by towns, making sanitary surveys and collecting samples of water which are then returned to the car for analyses. An average of 4 or 5 supplies are inspected while the car is at a given locality. The movements, as a rule, average about 50 miles, and the car lies at one point for from 24 to 72 hours. Upon the return of the officer to the car, a description of the sanitary aspect of the supply is card indexed, and from this, together with the results of the analytical examination, certificates as to the quality of the supply are issued.

When a water supply does not conform to the standard, either because of bacteriological impurities, or because of potential danger of contamination, a letter is prepared to the municipality, or the owner of the supply, outlining the conditions found and making recommendations for improvement. As most of the sources of water are public supplies, the work has had a beneficial result in bettering the water supply of thousands of people in cities, as well as those using the water on railroad trains.

The work in connection with the enforcement of the Interstate Quarantine Regulations relating to water supplies of vessels operating on the Great Lakes has been continued during the fiscal year. Pursuant with recommendations of the bureau, and following thorough and complete investigations extending over a period of several years regarding the conveyance of disease from contaminated water supplies on vessels plying the Great Lakes, data which has been referred to in previous annual reports for a number of years back, the Secretary of the Treasury issued on February 12, 1917, the

following circular letter to owners and others concerned in the use of water for drinking and culinary purposes on board lake vessels:

1917.
Department Circular No. 72.

Public Health Service.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, February 12, 1917.

To Owners, Agents, and Masters of Vessels Operating on the Great Lakes:

On and after the official opening of navigation in 1917, any person, firm, or corporation operating vessels in interstate traffic on the Great Lakes will be required to furnish on such vessels water for drinking or culinary purposes under one of the following conditions:

(*a*) If water for drinking or culinary purposes is not obtained ashore, it must be treated by an approved method.

(*b*) If water for drinking or culinary purposes is obtained ashore, it must be from an approved source.

On and after the official opening of navigation in 1917, the piping system on all vessels must be so arranged that no connection can be made between the drinking-water system and any other water system.

On and after the official opening of navigation in 1917, an approved sign, reading "DO NOT DRINK THIS WATER," must be properly placed at every tap or other outlet not connected with the drinking-water system.

Lake carriers are requested to acknowledge the receipt of this letter.

W. G. McADOO, Secretary.

Following the issuance of this letter lake carriers have very generally complied with its requirements and have installed the necessary treatment apparatus. Three methods for the purification of water have been approved, namely, distillation, sterilization by heat, using a steam jet, and sterilization through the use of the ultra-violet ray apparatus. Owing to the fact that the demand for appliances of this character was very great, following the promulgation of the order in question, the equipment of all vessels before the opening of navigation was not possible, hence those vessels which were unable to meet the requirements were permitted to resume operation upon presenting evidence that arrangements had been made to install the necessary equipment as soon as it could be provided. It is believed that the result of the enforcement of this regulation will materially reduce the incidence of typhoid fever and other water-borne diseases which have for many years been common as the outcome of infection contracted on board lake vessels. Numerous conferences have been held with shipping concerns regarding the interpretation of the regulation referred to.

During the year a number of special investigations have been carried out by the personnel of the district. In January, Sanitary Engineer H. P. Letton made a complete study of the sanitary quality of the public water supply of Milwaukee, Wis. On February 7 a comprehensive sanitary survey of the municipality of East Chicago was made by Asst. Surg. R. R. Spencer. During May, 1917, Sanitary Engineer Letton reported on the quality of the water supply of Bismarck, N. Dak. At two different times during the year, in accordance with bureau orders, he also consulted with organizations in Chicago relative to the sanitation of their swimming pools. A special investigation relative to the intake of the water supplied to the city of Keokuk, Iowa, was made by the office personnel of the laboratory car on May 19, 1917.

During August a number of bacteriological examinations were made for the purpose of testing an ozone apparatus which was pro-

posed by the owners to be used aboard trains and vessels. These tests showed that the apparatus, in its present form, would not produce a water meeting the Treasury Department standard.

A close study has been made of the sanitary features of all the railroad coach yards in Chicago with particular reference to the matter of handling, filling, and cleaning water coolers. This study has demonstrated the necessity of devising a standard type of water cooler and establishing standard methods of handling drinking water in all coach yards throughout the country.

On October 16, 1916, at the invitation of the Association of Railway Chief Surgeons, the following papers were read: "Activities of the U. S. Public Health Service Pertaining to Water Supplies of the Interstate Common Carriers," by Surg. J. O. Cobb; "A Short Discussion of Certain Technical Details and Difficulties Encountered in Making Analytical Examinations of Railway Water Supplies," by Asst. Surg. R. R. Spencer; "The Method of Handling Drinking Water Aboard Railway Trains" (illustrated), by Sanitary Engineer H. P. Letton.

In accordance with bureau orders of December 19, 1916, Surg. J. O. Cobb was directed to proceed to Indianapolis and Princeton, Ind., for the purpose of consultation with the State health authorities regarding the handling and disposition of a case of leprosy occurring at the latter place.

During the year Asst. Surg. Spencer has made numerous diagnostic examinations for Indian schools situated within the district, and performed many complement fixation tests in connection with the work of the marine hospital.

On June 12 the interstate sanitary car "Wyman" was hurriedly dispatched by telegraphic orders to the Great Lakes Naval Training Station, Great Lakes, Ill., to assist in the control of an epidemic of cerebrospinal meningitis at that point. On June 13 the officer in charge of the car reported to Medical Inspector DeValin, United States Navy, at the Great Lakes station and to Surg. G. W. McCoy, who had been detailed from the Hygienic Laboratory to take charge of the service investigations. The control of the epidemic necessitated an enormous amount of laboratory work, and therefore the laboratory car proved itself of the greatest utility. As it was necessary to take a large number of throat cultures in order to locate and isolate carriers, the laboratory of the sanitary district of the Great Lakes was used as a base for the preparation of media and for the final agglutination tests of suspicious organisms, the car "Wyman" being used for the taking of cultures and the first 24 hours incubation of the plates. At the close of the fiscal year the "Wyman" is still engaged in this work. Four hundred and thirty-seven cultures have been taken, most of which were from men who had not been in contact with the disease.

At the request of Medical Inspector DeValin, toward the close of the fiscal year, Sanitary Engineer H. P. Letton made a sanitary survey of the Great Lakes Naval Training Station. On June 22 Asst. Surg. R. R. Spencer was directed to report to the Surgeon General of the Navy for duty and orders in connection with the sanitation of certain naval districts. On June 27 the construction of a second laboratory car, which will soon be in commission, was authorized.

OPERATIONS OF THE SANITARY DISTRICT OF THE PACIFIC.

During the past fiscal year the operations of the interstate sanitary district of the Pacific have consisted mainly in the examination of samples of water from all sources of supply for interstate carriers within the limits of the district. This work heretofore had been done by the California State Board of Health and by various local health officers in the State of Nevada. These examinations were made at the Federal laboratory in San Francisco. The samples were collected at various points and shipped in special containers to the laboratory. In accordance with the Interstate Sanitary Regulations, these examinations are now being made regularly every six months.

On account of the great press of other work it was found impossible during the year to complete the sanitary surveys of watersheds that had been begun in the previous year. However, a comprehensive survey was made of the water supply of the city of Sacramento, and recommendations were made to the city health authorities in regard to proposed improvements.

On December 1, 1916, the Federal laboratory in San Francisco became the Interstate Sanitary Laboratory of the Pacific. For convenience all of the operations of this laboratory for the year, with the exception of water analyses, have been tabulated under the report of plague-suppressive measures. Below is a tabulated account of water analyses made during the year:

Examination of water supplies on interstate carriers.

Number of sources of water supplies in the District of the Pacific	136
Number of samples of water examined	183
Number of samples conforming to Treasury Department standard	151
Number of samples not conforming	32
Number of sources of supply certified	87
Number of sources of supply certified after improvements were installed	6
Number of sources of supply condemned	11
Number of sources of supply not used during the year	32

OPERATIONS OF THE SANITARY DISTRICT OF THE NORTH PACIFIC.

The work of the interstate sanitary district of the North Pacific was continued under the direction of Surg. B. J. Lloyd. The laboratory is at Seattle, Wash. The work in this district consists at present of water examinations (bacteriological) of supplies used on common carriers, sanitary surveys of watersheds from which these supplies are derived, the supervision of the interstate travel of persons suffering from communicable diseases, special scientific surveys, educational work along sanitary lines, and the enforcement of the interstate quarantine regulations generally. Examinations are conducted in the laboratory of specimens submitted by the Indian Service, specimens derived from patients in marine hospitals, together with such laboratory procedures as are required in the medical examination of arriving aliens.

During the year supervision of travel of 9 persons suffering from minor contagious diseases and 2 persons afflicted with leprosy was arranged for. One railroad coach was fumigated. One hundred

and sixty-four persons were vaccinated against smallpox and 40 were vaccinated against typhoid fever.

An investigation to determine the presence or absence of spirochaetes in rats (in view of the relation of this parasite to Weil's disease) was begun during the latter part of the fiscal year, but nothing had been determined at the close of the year. One fatal case, reported as Weil's disease, was investigated. Blood, taken aseptically, about two hours before death gave a streptococcus in pure culture in lactose bouillon (no growth in agar or plain bouillon). Inasmuch as this patient had just (apparently) recovered from an operation for cholecystitis it is believed that true epidemic jaundice may be excluded.

Laboratory operations.

Water samples examined for colon bacilli	206
Water samples examined, bacterial count	33
Urinalyses, microscopical	46
Urinalyses, chemical	119
Blood examinations, Widal	30
Blood examinations, Wasserman	174
Blood examinations, red cell count	2
Blood examinations, white cell count	7
Blood examinations, differential count	6
Stools examined for ova of parasites	1,525
Uncinaria found on primary examination	424
Trichuris found on primary examination	1,028
Ascaris found on primary examination	389
Other parasites found	138
Stools examined for cholera carriers	64
Stools examined, miscellaneous	2
Sputum examined for tubercle bacilli	46
Smears examined, throat	1
Cultures examined, throat	10
Cultures examined, miscellaneous	136
Sections of pathological tissues made	8
Autogenous vaccines made	15
Vaccinations, smallpox	164
Vaccinations, antityphoid	40
Stomach contents examined	4
Blood cultures examined	17
Animal inoculation for tuberculosis	3
Animal inoculations, various conditions	9
Specimens preserved	2
Stools examined for occult blood	2
Animals inoculated for spirochaete (Weil's disease), negative	12
Blood smears examined, rats, for spirochaetes	127
Blood smears examined, human, for spirochaetes (negative)	1
Smears examined, urethra	38

OPERATIONS OF THE SANITARY DISTRICT OF THE GULF.

During the past fiscal year the activities in this district have been confined almost entirely to the examination of water supplied vessels for drinking purposes. On several occasions samples of water have been received for examination from places distant from New Orleans, but this has not become a routine procedure. During December, 1916, a field survey was made by Asst. Surg. J. B. Laughlin of the water supply at Talladega, Ala., and in May, 1917, Asst. Surg. Teufel made a field survey of the water supply at Gallatin, Tenn.

The following is a detailed report of the water samples received at the laboratory and the results of the examination:

Vessels from which supplies were obtained	366
Total samples collected	479
Number of samples confirmed	303
Number of samples nonconfirmed	162
Number of samples badly polluted	28
Probability of contamination in handling	72
Number of supplies untreated	469
Number of supplies treated	70
Filtered	67
Distilled	0
Other methods	3

New equipment is now being installed in the laboratory which will enable it to meet all requirements. A number of requests have been received for the examination of the water supplies of nearby towns and the work of the Interstate Sanitary Laboratory should continue to increase as it becomes better known.

OPERATIONS OF THE SANITARY DISTRICT OF THE SOUTH ATLANTIC.

The work of this district for the fiscal year included laboratory examinations of 85 specimens of the city water supply of Savannah and sanitary surveys conducted in conjunction with the local health authorities of the sources of this supply. During the latter part of May, 1917, it became necessary to prohibit the use of this water by interstate carriers owing to failure to comply with the Treasury Department standard. Following the use of an additional amount of hypochlorite in the treatment of this water and the correction of certain insanitary conditions, the supply was brought to conform to the standard promulgated and its use was again permitted. Plans are now under way for extensive permanent improvements in the waterworks system involving an expenditure estimated at $500,000.

INVESTIGATION OF AN EPIDEMIC OUTBREAK AT TALLADEGA, ALA.

In December, 1916, a request was received from the health officer at Talladega, Ala., through the State board of health, for the detail of an officer to assist in the control of an outbreak of diarrhea and enteritis occurring in that city, presumably caused by a contaminated water supply. Accordingly, Asst. Surg. Jas. B. Laughlin was directed under orders of December 6, 1916, to proceed to Talladega for that purpose.

For a number of years Talladega, a city of 6,000 people, had suffered excessively from typhoid fever, the mortality rate averaging well above 100 per 100,000 population. In addition there had been frequent outbreaks of diarrhea and enteritis, particularly among newcomers, and conclusive bacteriological evidence had been offered of a marked degree of pollution of the city water supply. At this time the water was derived from a spring. The geological formation was limestone, more than 400 surface privies existed in the community, and the sewer system was defective. Believing that the presence of disease was due to a contaminated water supply brought about by these conditions, action was taken and two wells, each in proximity to the spring, were sunk to a depth of more than 400 feet.

From the fall of 1912, when the wells were completed, until May, 1915, water was obtained exclusively from this source but typhoid and diarrheal diseases continued and *B. coli* were invariably present in the water examined. After investigation the State sanitary engineer recommended the installation of a liquid chlorine plant, and following the equipping of the same there was an immediate decline in the typhoid fever and dysentery death rate.

The outbreak in question commenced about October 28, 1916, approximately 500 cases of diarrhea developing within a period of 10 days, reaching a maximum of 1,500 cases, the estimate of the health officer, within a short time. The disease was widespread, occurring equally in all portions of the city with the exception of a section receiving its water supply from individual wells; here there were fewer cases, although it was impossible to entirely exclude the use of city water in the washing of vegetables and for other purposes. The symptoms were the same in every instance, the disease being characterized by sudden and uncontrollable diarrhea, accompanied by abdominal pain, and followed by weakness, the condition in some instances continuing for a number of weeks. Upon stopping the use of the city water the symptoms nearly always abated.

Questioning of the superintendent of the waterworks elicited the fact that just before the epidemic outbreak developed, owing to the breakage of one of the valves of the chlorinating apparatus, no chlorine had been added to the water and during this time water from both the wells and the spring had been pumped into the mains. Further investigation determined that the amount of chlorine added was not efficiently regulated and that the effectiveness of the plant, even when in operation, was not controlled by bacteriological analyses, so that there was no way of determining whether the amount of chlorine going into the water was sufficient to render it safe. Samples of the spring water collected and examined showed 10,000 bacteria in 1 cubic centimeter and *B. coli* in 1 cubic centimeter. In samples which had undergone proper chlorination *B. coli* were not found.

For the control of the epidemic it was recommended that all water used for drinking and culinary purpose be boiled until assurance could be given that the city supply had received proper treatment; that the chlorinating plant be scientifically operated, the effectiveness of the apparatus to be controlled by bacteriological examinations; that the use of the spring water be abandoned and that all surface privies be eliminated and the sewage system repaired. It was further advised that if for any reason necessity arose to pump untreated supplies into the city mains the people should be notified to boil their water until it was reasonably certain that all of the untreated water had been forced out of the system and the chlorinated water was again in circulation.

INVESTIGATION OF THE WATER SUPPLY AT BALTIMORE, MD.

In the work of certification of water supplies for use on interstate carriers it was reported to the Public Health Service by the Maryland State Board of Health that the water supplied common carriers in the city of Baltimore failed to conform to the standard promulgated by the Treasury Department and that it was therefore impossible to issue a certificate covering this source. This fact being

reported to the commissioner of health of Baltimore a request was received from this official, concurred in by the secretary of the State board of health, for a thorough investigation of the water supply with the possibility of determining the conditions at fault. In accordance with this request Passed Asst. Surg. H. E. Hasseltine and Sanitary Engineer W. D. Wrightson were detailed to proceed to Baltimore for this purpose. At the termination of the fiscal year this investigation was still in progress.

INVESTIGATION OF AN ALLEGED CASE OF TYPHOID AT SAN LUIS OBISPO LIGHTHOUSE.

In October, 1916, in compliance with a request received from the Commissioner of the Lighthouse Service an officer was detailed to investigate an alleged case of typhoid fever occurring in the family of the assistant keeper of the lighthouse at San Luis Obispo. Cal., Asst. Surg. D. S. Baughman being assigned to the duty in question. The facts elicited are well worthy of record.

It was ascertained by the investigating officer that the patient, a young girl of 15, had previous to her illness been in the habit of visiting a small village of 250 inhabitants 4 miles distant. Her illness was abrupt in onset, with severe headache, pain in the back of the neck, and general weakness, more pronounced in the lower extremities. Within a short time the weakness of the limbs became accentuated and other symptoms of a serious nature developed, the case terminating fatally on the fifth day of illness. These facts, elicited from the family and the physician, failed to thoroughly establish the diagnosis of typhoid fever to the satisfaction of the inspecting officer, and, indeed were more indicative of death from some other cause.. Accordingly it was decided to investigate conditions in the near-by village where the child had visited.

Upon inquiry from the townspeople it was ascertained that there had been no cases of suspicious illness in the village or vicinity, but it was recalled upon further questioning that a child had recently been ill. This child was examined, and the mother informed the inspecting officer of another child who had been similarly afflicted, while the second mother was able to recall a third who had also been ill. In this manner three additional cases, resulting in two deaths, were brought to light, all more or less typical of poliomyelitis. Upon attempting to determine the source of the infection it was learned that nearly three months previously a woman with four children had come to the village from New York City, where the children had been definitely exposed to poliomyelitis. During the course of the journey one of the children became suddenly ill with high fever and paralysis, death resulting before the final destination was reached. The mother, with the remaining members of the family, completed her journey, and soon after her arrival the first cases developed. Definite instances were recalled where the older children of the families in which the disease appeared had associated with the children of the New York woman, thus establishing the chain of infection. The fact that the true nature of the disease had not been determined and that the infection was unquestionably transferred directly from the Atlantic to the Pacific seaboard are the striking features of what was regarded as an ordinary occurrence of a case of typhoid fever.

SANITARY SURVEY OF YOSEMITE NATIONAL PARK.

On December 2, 1916, the Assistant Secretary of the Interior requested that an officer of the Public Health Service be detailed for the purpose of making an examination as to the sanitary and other related conditions in the Yosemite National Park, and to suggest such measures as were necessary for the betterment thereof. In as much as national parks are places of congregation of persons from all parts of the United States, and since the occurrence of insanitary conditions in those localities greatly favor the interstate spread of disease, Senior Surg. L. L. Williams was detailed for the purpose of making the sanitary inspection requested. Passed Asst. Surg. C. L. Williams was directed to examine in the interstate sanitary laboratory at San Francisco water samples collected from the more important sources. Senior Surg. Williams made a careful survey of those portions of the park which could be visited at that season of the year. The water samples collected by him were examined and a report of the entire operation transmitted to the Department of the Interior.

SANITARY INSPECTION OF GOVERNMENT VESSELS.

In consonance with a request received from the Chief of Engineers, United States Army, a sanitary inspection was conducted November 20, 1916, of the United States dredges *Maumee* and *Burton* and the tender tug *Spear*. A report was submitted by Surg. John M. Holt, who made the inspections, covering the vaccination of the crew against smallpox and typhoid, the system of handling and storage of water supplies, the complement of medicine chests, and other items having a bearing upon the health of the officers and men.

INSPECTION OF GOVERNMENT BUILDINGS.

Conformable with Executive Order No. 1498 of March 15, 1912, all buildings of the executive branch of the Government within the District of Columbia, excepting those of the War and Navy Departments, have been inspected during the year with reference to their hygienic and sanitary condition. These inspections were made by Surgs. M. H. Foster and E. A. Sweet and Passed Asst. Surg. J. R. Hurley. A gratifying improvement is everywhere noticeable since the inspections were instituted, evidencing each year attainment of higher standards. In a certain number of buildings expensive structural alterations are required in order to have them conform with modern conceptions of hygiene and sanitation, but even in these the standard of cleanliness and order is excellent and complaints are relatively infrequent.

Ventilation.—The majority of the buildings are ventilated from natural sources, and in most instances this means would be satisfactory were free use made of open windows. Unfortunately, this method is not always utilized to the necessary extent, owing to the fact that many employees, on account of their age or physical condition, are very sensitive to drafts. However, through the installation of the glass wind deflectors in window bases these objections have been largely overcome.

Lighting.—The most satisfactory type of semi-indirect lighting is in use in but few of those buildings where artificial light is needed

in the daytime. In most instances, however, save on dark days, ample daylight to carry on the work is available. This is supplemented, where needed, principally by the use of fixtures of the direct type. Where these produce glare in the employees' eyes, troublesome shadows, or an insufficiency of light, such matters are reported upon with accompanying suitable recommendations for the improvement of existing conditions.

Heating.—As commented upon in previous reports the prevailing and almost the only defect found in this regard is the creation of too high a temperature in offices, coupled with too low atmospheric humidity. This defect undoubtedly contributes to an increased morbidity among the employees from affections of the respiratory tract. It is practically impossible to overcome the defect mentioned without an expenditure of funds that in most cases are unwarranted under the circumstances.

Overcrowding and congestion.—The conditions of overcrowding and congestion noted in many buildings in previous years were found to be markedly improved during the past winter, brought about through new construction and the securing of additional quarters in rented buildings. However, due to the additional work thrown on the departments following the declaration of war, necessitating a greatly increased personnel, despite the securing of new office space, the congestion in some offices has again become marked. Plans are on foot to remedy this condition, and in the meantime every effort possible is being made to secure free ventilation and otherwise protect the health of the employees.

Drinking-water supplies.—Special care is taken in all buildings to supply employees with a chilled water which is protected from contamination. This is secured through cooling the water by other means than by permitting the ice to come directly into contact therewith, by furnishing each employee with an individual drinking glass, and the issuance of regulations prohibiting leaving these at coolers for common use.

Toilets and lavatories.—These conveniences, as regards facilities and maintenance, are in most instances above reproach. Cakes of hand soap for common use are prohibited in the majority of the buildings and liquid soap with individual towels are generally provided.

Cleaning and general cleanliness.—As regards general cleanliness the Government buildings in Washington have reached a high state of excellence. This has been secured in part by the centralization of the authority responsible for results in this regard by placing the cleaning force in each building under a capable person and partly by the introduction of improved methods of cleaning. Electric floor-scrubbing machines and vacuum cleaners have been installed in many instances, by which means much better results are obtained without additional labor.

Welfare of employees.—The fitting up in the larger Government buildings of lunch rooms and women's rest rooms and the installation of emergency hospitals, safety devices, shower baths, etc., in those buildings where large-scale mechanical processes are carried on have been of great benefit in both conserving the health of employees and producing contentment.

SPECIAL SANITARY INVESTIGATIONS OF GOVERNMENT BUILDINGS.

In conformity with a request submitted to the Treasury Department by the custodian of the old post-office building at Pittsburgh, Pa., an officer was detailed May 21, 1917, to investigate sanitary conditions in that building with special reference to rat infestation, Asst. Surg. C. V. Akin being assigned to the duty in question. It was ascertained that rat infestation existed to such an extent that damage to the mails was of frequent occurrence, although the general sanitary condition of the building was excellent, the rodents in most instances gaining access to the structure from outside sources. Specific recommendations for the correction of existing conditions were advanced, these comprising the elimination of rat harborage beneath floors, the screening of ventilating flues, and the pointing up of unnecessary apertures with cement mortar.

Under date of May 23, 1917, Passed Asst. Surg. J. H. Smith was directed to proceed to Columbus, Ga., for the purpose of making an inspection of the post office at that city and to submit through the usual channels a report relative to infestation of the building by rats and also concerning the methods of lighting, heating, and ventilation. It was ascertained that the difficulty with rodents apparently originated with the handling of food products by parcel post. Recommendations were submitted for the elimination of the rat population and the correction of other defects of construction and operation.

The group of buildings, 14 in number, comprising the Columbia Institution for the Deaf at Washington, D. C., were surveyed by Asst. Surg. C. V. Akin in compliance with orders of February 14, 1917, the investigation being conducted at the request of the president of the college on account of trouble from rat infestation. After a careful investigation of conditions with reference to the storage of food supplies and facilities for the harboring of rodents, measures for the correction of the evil were recommended.

GOVERNMENT SAFETY-FIRST TRAIN.

The Government safety-first train, depicting the various activities of the Federal Government in the conservation of human life, continued its itinerary from July 1 to August 29 of the present fiscal year, the States of Oklahoma, Kansas, Nebraska, Colorado, Wyoming, and Utah on the lines of the Missouri, Kansas & Texas, and Union Pacific Railways being visited. The itinerary, as extended, was completed at Beatrice, Nebr., and the train was immediately returned to Washington for disbandment.

From the date of the inception of the trip, May 1, 1916, to August 29, 1916, a total distance of 9,093 miles was traveled and 87 cities and towns in 16 States were visited. The number of visitors was 531,982 and the average daily attendance 5,215. Had it not been for the limited capacity of the train these numbers would have been considerably larger as many thousand visitors were turned away. Motion pictures, illustrative of governmental activities along humanitarian lines, with special reference to health and safety, were shown to 140,600 persons. Everywhere the extent and instructiveness of the exhibit were highly praised, it being the consensus of opinion among visitors that the exposition was of great educational value.

THE EMERGENCY HOSPITAL, PANAMA-PACIFIC INTERNATIONAL EXPOSITION.

The operations of the emergency hospital, established for the relief of the sick and injured at the Panama-Pacific International Exposition, were not terminated until November 15, 1916, the process of demolition of numerous buildings on the grounds necessitating the continuance of an institution of this character although during the post-exposition period the hospital was conducted practically as an out-patient clinic. Throughout the period of operation only emergency cases were handled and all patients requiring prolonged treatment were either referred to various hospitals or to private physicians designated by the exposition management.

From the date of opening of the hospital, February 18, 1914, to the date of closing, November 15, 1916, 10,794 persons received medical or surgical attention, an average of slightly more than 10 a day. In addition to this number 1,729 patients were retreated, the retreatment aggregating 4,997, so that relief was furnished on 15,791 occasions. A summary of the relief furnished and work accomplished is as follows:

Cutting and piercing accidents	1,731
Traumatism by machines, etc	689
Other external violences	1,406
Fractures	308
Nervous system, diseases of	544
Purulent infections	293
Sprains	417
Syncope	158
Stomach, diseases of	402
Skin, diseases of	276
Nasal fossæ, diseases of	193
Diarrhea and enteritis	167
Antityphoid inoculations	721
Roentgenograms	974
Miscellaneous conditions	3,489

RAT ERADICATIVE CAMPAIGN, NORFOLK, VA.

In the latter part of February, 1917, it was reported to the Secretary of the Navy by the supervisor of naval auxiliaries for the fifth naval district that the coal wharves and piers at Newport News, Sewalls Point and Lamberts Point (Norfolk), Va., were heavily infested with rodents which migrated to and from vessels in large numbers whenever they docked for coal. The matter had previously been brought to the attention of Dr. P. S. Schenck, commissioner of health for the city of Norfolk, who, appreciating the urgent need of protecting the city's health, and also the danger of the interstate spread of disease from potentially plague-infected rodents, appealed to the bureau for assistance. Following an interchange of communications between the Navy and Treasury Departments, Asst. Surg. C. V. Akin was ordered, March 23, 1917, to assume charge of the situation.

Upon the arrival of the officer in charge at Norfolk a preliminary survey of the harbor was instituted to determine the points of heaviest rat infestation. It was ascertained that the wharves and docks maintained by the several shipping interests were in poor

structural condition and provided well-prepared harbors for rodents coming from coastwise and foreign vessels lying alongside. At Lamberts Point it was found that the three skeleton steel coaling piers offered little opportunity for rat infestation, but that a fourth pier afforded comfortable and safe harborage. At the landward ends of these piers there was a collection of wooden-box constructed buildings used as offices and storerooms, erected on "made land" of loosely packed composition, which offered favorable conditions for the easy living of rats. These buildings rested upon, or slightly below, the surface of the ground. Similar surroundings were discovered at Sewalls Point and Newport News, the only difference being the extent of the conditions favoring rat harboring. At the latter place each laborer had been permitted to construct an individual locker, in which was kept tools, clothes, and lunches. While none of these huts was large, their multiplicity and the fact that food products were stored therein made rat hiding easy and comfortable.

Upon completion of the inspection a written report of the conditions, as found, and recommendations advanced was submitted to the railway officials in immediate charge of the property concerned and immediately plans were formulated for making the necessary structural changes to bring about a reduction in rat infestation. A sufficient amount was appropriated for by the common council of the city of Norfolk to institute trapping and poisoning operations and over 2,600 rodents were captured. To prevent the ready running of rodents from vessels to shore and from shore to vessels all ships were fended off a distance of 8 feet from the wharf while lying-to or loading and provided with metal rat guards on all lines, orders being issued by the supervisor of naval auxiliaries to this effect. In order to insure proper compliance with these requirements a copy of Public Health Bulletin No. 86 was sent to each yard and regular inspections were made. The rat proofing of buildings by elevation and the construction of concrete flooring was recommended and met with a ready response on the part of owners. In this manner 24 buildings were elevated and 2,738 square feet of concrete laid, together with the installation of 998 linear feet of chain wall. A policy of concentration was recommended for the property at Newport News, and the owners, agreeing, constructed a large building of corrugated iron, providing it with a concrete floor, in place of the many smaller buildings which previously existed. This was surrounded with a wall of concrete, extending from a point 2 feet below the ground level upward to 1 foot above the floor. Within the structure lockers were built, one being assigned to each laborer. This single building fulfilled the best requirements for rat proofing and at once did away with at least 100 unsightly and dangerous other structures, to say nothing of the total elimination of a dangerous fire hazard. These facts necessarily appealed to the owners as economically advantageous.

VACCINATION OF THE GENERAL PUBLIC AGAINST SMALLPOX, TYPHOID, AND PARATYPHOID FEVER.

During the fiscal year 1915 a department circular was issued by the Secretary of the Treasury offering to all civil employees of the Government whose duties obliged them to engage in interstate traffic,

or who were concerned in the handling of mail, free vaccination against smallpox and typhoid fever. Since the issuance of this circular the difficulties encountered in the enforcement of general sanitary measures in times of great national stress and the expenditure of money and time necessary for the improvement of sanitary conditions in order to bring about a reduction of the incidence of disease have led to the more widespread adoption of individual immunization toward the accomplishment of this end. In conformity with this tendency, and in order to attain the greatest benefit in the shortest possible time, a department circular was issued by the Secretary of the Treasury, under date of May 16, 1917, offering to the general public free vaccination against either smallpox, typhoid, or paratyphoid fever, this vaccination to be administered at any one of the 168 stations of the Public Health Service:

1917.
Department Circular No. 83.

Public Health Service.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, May 16, 1917.

To medical officers of the United States Public Health Service, and others concerned:

Hereafter, as a means of preventing the interstate spread of disease either by military forces or the civil population, any person in the United States may receive, without cost, upon applying in person at those places designated by the Surgeon General of the United States Public Health Service, vaccination against any one or all of the following-named diseases: Smallpox, typhoid fever, paratyphoid fever.

Medical officers and others charged with the duty of performing such vaccinations should make requisition for the materials necessary therefor, and shall render a monthly report showing the names of those so vaccinated, their addresses, and the date of said vaccination. Upon the request of any person so vaccinated certificate of vaccination may be issued.

W. G. MCADOO, *Secretary.*

While the effect of this order at the time of the submission of this report has not had time to manifest itself, it is believed that ultimately not only will many thousands receive the preventive treatment for these diseases, which is now on a well-proven and satisfactory basis, but that direct stimulation of vaccination by private physicians will result. It is expected that in the sanitation of extra-cantonment zones, where it is desirable to reduce the incidence of disease to the lowest possible minimum in the least possible time, that vaccination will prove a useful adjunct to other sanitary measures. It is contemplated that all vaccines other than smallpox virus will be manufactured in the Hygienic Laboratory, thus insuring purity and potency of the product.

ESTABLISHMENT OF A NATIONAL HOME FOR LEPERS.

The long-continued agitation for the establishment of a national home for lepers was consummated February 3, 1917, with the enactment of legislation authorizing the founding of an institution of this character and appropriating $250,000 therefor. The passage of this measure is particularly gratifying and marks another forward step in public health legislation. The constantly increasing difficulties in dealing with the leprosy problem have long been apparent to public health officials in nearly every section of the country, and it has been realized that only by proper segregation could the

solution of the problem be accomplished. Not only is segregation demanded for reasons of health, but it is fully as important on economic and humanitarian grounds.

The legislation as enacted authorizes the Secretary of the Treasury to select and obtain a site suitable for the establishment of a home for the care and treatment of lepers, to be administered by the Public Health Service, and to cause such buildings to be erected thereon as may be necessary. Provision is made for the reception into said home, under regulations prepared by the Surgeon General, of any person afflicted with leprosy who presents himself for care and treatment, those who may be apprehended under authority of the United States quarantine acts, or those who are duly consigned to the home by the proper health authorities of any State or Territory, the expenses of transportation to be paid from funds set aside for the maintenance of the home. The regulations governing the institution are to be prepared by the Surgeon General, subject to the approval of the Secretary of the Treasury.

COOPERATION WITH SOUTHERN SOCIOLOGICAL CONGRESS.

Upon request of the secretary of the Southern Sociological Congress, an officer was detailed to assist the Congress in a health and welfare extension campaign carried on in various sections of the country, orders being issued October 7, 1916, to Surg. B. W. Brown to this effect. The following cities were visited: Winston-Salem, N. C.; Farmville, Va.; Petersburg, Va.; Hopewell, Va.; Richmond, Va.; Charlotte, N. C.; Spartanburg, S. C.; Rock Hill, S. C.; Greenville, S. C.; Seneca, S. C.; and Chattanooga, Tenn. Public meetings were held in the cities mentioned, at which health and welfare subjects were discussed and exhibit material relating to health and community betterment, a portion of which was contributed by the service, was displayed. The attendance at meetings of this character totaled 51,090, and approximately 47,000 people viewed the exhibits, civic organizations, churches, and woman's clubs cooperating in the work. At all of these gatherings special stress was laid on the manner of dissemination and the methods of control of the particular diseases prevalent in that locality and the various phases of public health work were especially emphasized.

In addition to the educational features, upon request of State and local health agencies, brief sanitary surveys of the majority of communities visited were instituted. These consisted of the examination of city ordinances relating to health, the determination of housing conditions, the inspection of public and private water supplies and the watersheds from which they were derived, the disposal of waste, the number and condition of surface toilets, and other easily obtained data bearing upon health. Upon conclusion of the investigations specific recommendations were advanced for the correction of the more obvious defects noted.

COOPERATION WITH STATE CIVIL SERVICE COMMISSIONS IN EXAMINATIONS FOR HEALTH OFFICERS.

During the year examinations have been conducted by the Public Health Service for the Illinois and California State Civil Service Commissions for the purpose of selecting competent persons as dis-

trict health officers in those States, and also for the position of director of the bureau of communicable diseases, State of California. The examinations have included in their scope such subjects as epidemiology, bacteriology, and public health administration, the questions covering these subjects either being formulated and forwarded to the examining board or the candidates appearing before boards of commissioned officers convened for that purpose in representative cities, these boards basing their ratings not only upon the results of the written and oral examinations but also upon the experience and general fitness of the applicants. Through the assistance rendered in this manner civil service commissions have been able to secure candidates for important positions from other districts than their own and a higher standard of administrative officers has undoubtedly been secured.

FIRST-AID INSTRUCTION.

At the request of various schools and organizations interested in the principles governing medical and surgical relief first-aid instruction has been given during the year to a number of classes in various sections of the country. The membership of these organizations has included Red Cross units, high-school students, women undergoing training for national service, officers and men of the merchant marine, to whom the courses have been of particular advantage, and others. The following officers have been detailed to duty of this character: Surgs. G. B. Young, M. H. Foster, A. D. Foster, and E. A. Sweet; Passed Asst. Surgs. J. R. Hurley and E. R. Marshall, and Asst. Surgs. O. H. Cox and H. A. Spencer.

EXTENSION OF STEREOPTICON LOAN LIBRARY.

More extensive use has been made during the year of the stereopticon loan library, established for the purpose of teaching important lessons in sanitation and demonstrating the principles governing disease prevention, than at any previous time. Loans have been made to 549 individuals and organizations and more than 27,000 slides have been in circulation. Based upon voluntary, but altogether incomplete, returns it is estimated that these health views were shown to audiences numbering more than 120,000 persons, and examination of the records proves that the slides have been sent to practically every State in the Union. The slides now in circulation number 2,500. These photographs have been extensively copied and the manufacturer reports that he is frequently in receipt of requests from foreign countries for these health pictures. Lectures to accompany the views have been prepared upon at least two subjects and as time affords other subjects will receive attention.

The library itself has recorded a material growth in the number of the slides and the character of the views has been correspondingly improved. Sets of slides relating to the hygiene of infants, the sanitary production and care of milk, and kindred subjects have been prepared and found particularly useful during Baby Week celebrations, at farmers' conventions, health meetings, and on other occasions. The motion-picture films in possession of the service, although limited in number, have been in constant use and the necessity for further equipment of this character is again evident, frequent requests for films having to be refused.

SANITARY REPORTS AND STATISTICS.

Through the Division of Sanitary Reports and Statistics, the Public Health Service keeps informed of the occurrence of outbreaks and epidemics and of the prevalence and geographic distribution of preventable diseases, makes disease maps, keeps cognizant of current sanitary legislation through the collection and compilation of State and municipal laws and regulations and court decisions on matters relating to the public health, and publishes weekly the Public Health Reports.

Prevalence of Disease in the United States.

During the year all available information of the prevalence and geographic distribution of communicable disease has been collected, as in previous years. This work, begun 39 years ago, pursuant to act of Congress, approved in 1878, has been continued with ever-increasing scope. The agencies composing the intelligence system by means of which information of disease occurrence and prevalence is currently collected consist of the State health authorities, the health authorities of municipalities, counties, townships, towns, and boroughs, officers of the Public Health Service stationed throughout the country, and, for some diseases, the practicing physicians. These different agencies report with varied frequency, some when there exists an unusual disease prevalence, others regularly each week, and others monthly. In addition, the State and city authorities furnish annual statements of the prevalence of preventable diseases within their several jurisdictions. The system of reports has been developed until it now covers approximately 80 per cent of the population of the country. The States and cities from which reports are not received have undeveloped health organizations, and information of the occurrence of disease in their respective jurisdictions is not of record and therefore not obtainable through the usual channels.

Current reports.—Through the current reports received from the various cooperating officials, current information has been available at all times during the year of the outbreak of epidemics or the occurrence of unusual disease prevalence. This information has been made available from week to week to the health officials of the country and those engaged in public health work through the medium of the Public Health Reports.

Municipal weekly morbidity reports.—The cities having efficiently organized health departments have furnished each week statements

of the prevalence of notifiable diseases in their respective jurisdictions. The cities able to furnish these reports have shown a constant increase in number. The quality and dependability of the reports have also improved.

These reports are made on franked postal-card forms which are supplied to the health officers of all the cities of over 50,000 population—128 cities—and to many of the smaller urban communities from which weekly reports have been received for a number of years.

A reproduction of the report card follows:

Form 1965.—F. C., Jan. 17-16.

MUNICIPAL WEEKLY MORBIDITY REPORT.

*City*_____

For the week ended Saturday, _____, *191*__

*Total number of deaths from all causes*_____

Disease.	New cases notified.	Deaths registered.
Erysipelas		
Gonorrhea		
Leprosy		
Malaria		
Meningitis (epidemic cerebrospinal)		
Pellagra		
Pneumonia (lobar)		
Poliomyelitis (infantile paralysis)		
Rabies (in man)		
Rabies (in animals)		
Smallpox		
Syphilis		
Tetanus		
Typhoid fever		
Typhus fever		
Diphtheria		
Measles		
Scarlet fever		
Tuberculosis (all forms)		

Date mailed _____, *191*__.

(*Signature*) _____

Health Officer.

Report for each week should be mailed not later than the following Tuesday.

In June, 1916, 160 cities were forwarding these reports. At the end of June, 1917, the number reporting had been increased to over 200 per week. Many of the cities had reported promptly for every week of the year. Some cities failed to mail their reports promptly

and some others reported irregularly. The cities that reported with satisfactory regularity were:

Alameda, Cal.
Ann Arbor, Mich.
Atlantic City, N. J.
Baltimore, Md.
Bayonne, N. J.
Berkeley, Cal.
Binghamton, N. Y.
Birmingham, Ala.
Boston, Mass.
Braddock, Pa.
Bridgeport, Conn.
Brockton, Mass.
Brookline, Mass.
Buffalo, N. Y.
Butler, Pa.
Cambridge, Mass.
Camden, N. J.
Canton, Ohio.
Charleston, S. C.
Chelsea, Mass.
Chicago, Ill.
Chicopee, Mass.
Cincinnati, Ohio.
Cleveland, Ohio.
Coffeyville, Kans.
Columbus, Ohio.
Concord, N. H.
Covington, Ky.
Cumberland, Md.
Danville, Ill.
Denver, Colo.
Detroit, Mich.
Dubuque, Iowa.
Duluth, Minn.
East Orange, N. J.
Elgin, Ill.
Evansville, Ind.
Everett, Mass.
Everett, Wash.
Fall River, Mass.
Fitchburg, Mass.
Fort Worth, Tex.
Galesburg, Ill.
Galveston, Tex.
Grand Rapids, Mich.
Harrisburg, Pa.
Hartford, Conn.
Haverhill, Mass.
Hoboken, N. J.
Indianapolis, Ind.
Jackson, Mich.
Jersey City, N. J.
Johnstown, Pa.
Kalamazoo, Mich.
Kansas City, Mo.
Kearny, N. J.
Kenosha, Wis.
Kokomo, Ind.
La Crosse, Wis.
Lancaster, Pa.
Lawrence, Mass.
Lexington, Ky.
Lima, Ohio.
Lincoln, Nebr.
Little Rock, Ark.
Long Branch, N. J.
Lorain, Ohio.
Los Angeles, Cal.
Lowell, Mass.
Lynchburg, Va.
Lynn, Mass.
Malden, Mass.
Manchester, N. H.
McKeesport, Pa.
Medford, Mass.
Milwaukee, Wis.
Minneapolis, Minn.
Mobile, Ala.
Montclair, N. J.
Morristown, N. J.
Nanticoke, Pa.
Nashville, Tenn.
Newark, N. J.
New Bedford, Mass
New Britain, Conn.
Newburyport, Mass.
New Castle, Pa.
New Haven, Conn.
New London, Conn.
New Orleans, La.
Newton, Mass.
New York, N. Y.
Niagara Falls, N. Y.
Norfolk, Va.
Norristown, Pa.
North Adams, Mass.
Northampton, Mass.
Ogden, Utah.
Oklahoma City, Okla.
Omaha, Nebr.
Orange, N. J.
Pasedena, Cal.
Passaic, N. J.
Pawtucket, R. I.
Perth Amboy, N. J.
Philadelphia, Pa.
Pittsburgh, Pa.
Pittsfield, Mass.
Plainfield, N. J.
Portland, Me.
Portland, Oreg.
Portsmouth, Va.
Providence, R. I.
Racine, Wis.
Reading, Pa.
Richmond, Va.
Roanoke, Va.
Rochester, N. Y.
Rutland, Vt.
Sacramento, Cal.
Saginaw, Mich.
St. Joseph, Mo.
St. Louis, Mo.
Salt Lake City, Utah.
San Diego, Cal.
Sandusky, Ohio.
San Francisco, Cal.
San Jose, Cal.
Saratoga Springs, N. Y.
Schenectady, N. Y.
Somerville, Mass.
South Bend, Ind.
Springfield, Ill.
Springfield, Mass.
Steelton, Pa.
Steubenville, Ohio.
Superior, Wis.
Syracuse, N. Y.
Tacoma, Wash.
Taunton, Mass.
Toledo, Ohio.
Trenton, N. J.
Troy, N. Y.
Waltham, Mass.
Washington, D. C.
Wheeling, W. Va.
Wichita, Kans.
Wilkes-Barre, Pa.
Wilkinsburg, Pa.
Williamsport, Pa.
Wilmington, Del.
Worcester, Mass.
Zanesville, Ohio.

The following are the cities that were either irregular in sending their reports or frequently mailed them late:

Akron, Ohio.
Albany, N. Y.
Allentown, Pa.
Alton, Ill.
Altoona, Pa.
Auburn, N. Y.
Aurora, Ill.
Austin, Tex.
Beaver Falls, Pa.
Bellingham, Wash.
Berlin, N. H.
Brownsville, Tex.
Butte, Mont.
Cairo, Ill.
Chattanooga, Tenn.
Clinton, Mass.
Colorado Springs, Colo.
Columbia, S. C.
Davenport, Iowa.
Dayton, Ohio.
Dunkirk, N. Y.
East Chicago, Ind.
Elizabeth, N. J.
El Paso, Tex.
Erie, Pa.
Flint, Mich.
Fort Wayne, Ind.

Green Bay, Wis.
Hagerstown, Md.
Hamilton, Ohio.
Harrison, N. J.
Kansas City, Kans.
Kingston, N. Y.
Knoxville, Tenn.
Long Beach, Cal.
Madison, Wis.
Marinette, Wis.
Melrose, Mass.
Memphis, Tenn.
Muscatine, Iowa.
Nashua, N. H.
Newburgh, N. Y.
Newport, Ky.
Newport, R. I.
Oakland, Cal.
Pontiac, Mich.
Portsmouth, N. H.
Quincy, Ill.
Quincy, Mass.
Rockford, Ill.
Rock Island, Ill.
Rocky Mount, N. C.
St. Paul, Minn.
Savannah, Ga.
Seattle, Wash.
Sioux City, Iowa.
South Bethlehem, Pa.
Springfield, Ohio.
Stockton, Cal.
Tampa, Fla.
Terre Haute, Ind.
Topeka, Kans.
Washington, Pa.
Watertown, N. Y.
West Hoboken, N. J.
Wilmington, N. C.
Winston-Salem, N. C.
Woburn, Mass.
York, Pa.

Of the cities of 50,000 or more population, no reports were received from the following, due in most instances to the fact that the health departments did not have the necessary records from which to furnish the information:

Atlanta, Ga.
Augusta, Ga.
Dallas, Tex.
Des Moines, Iowa.
East St. Louis, Ill.
Holyoke, Mass.
Houston, Tex.
Jacksonville, Fla.
Paterson, N. J.
Peoria, Ill.
Pueblo, Colo.
San Antonio, Tex.
Scranton, Pa.
Spokane, Wash.
Waterbury, Mass.
Yonkers, N. Y.
Youngstown, Ohio.

Of the urban communities having populations between 10,000 and 50,000 many have not yet been able to furnish weekly reports because of having no health officers or because of lack of clerical force in their health departments. In some instances their records were not so kept that the figures were readily available for making current reports.

Monthly State reports.—At the beginning of the year monthly reports of the occurrence and prevalence of notifiable diseases were received from 26 States and the District of Columbia, as follows: Arkansas, California, Connecticut, District of Columbia, Idaho, Indiana, Iowa, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Montana, New Jersey, New York, North Dakota, Ohio, Oregon, South Carolina, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming. The following States began reporting during the year: Alabama, Colorado, Maine, Nevada, New Hampshire, Pennsylvania, Rhode Island, and South Dakota. At the end of the year, therefore, current monthly reports were being received from 35 States having an aggregate estimated population of 72,398,112; representing 71 per cent of the entire population of the continental United States.

The following States were unable to furnish monthly reports: Arizona, Delaware, Florida, Georgia, Illinois, Kentucky, Missouri, Nebraska, New Mexico, North Carolina, Oklahoma, Tennessee, Texas, and Utah.

Annual State and city summaries.—For the last five years, beginning with the calendar year 1912, the Public Health Service has published annual statements of the prevalence of certain notifiable diseases in the States and cities that kept suitable records from which the data were available.

For the year 1912, 19 States, the District of Columbia, and the Territory of Hawaii, and about 260 cities were able to furnish the necessary data for these reports.

For the calendar year 1916 the following States were included: Alabama, Arizona, California, Colorado, Connecticut, the District of Columbia, the Territory of Hawaii, Indiana, Iowa, Kansas, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Montana, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, Washington, Wisconsin, and Wyoming.

The population of these 28 States, with the District of Columbia, was 67,348,100, representing 66 per cent of the inhabitants of the continental United States.

Annual statements for 1916 were not received from Arkansas, Delaware, Florida, Georgia, Idaho, Illinois, Missouri, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Oklahoma, South Dakota, Tennessee, and Utah.

On succeeding pages of this report will be found analyses of these summary reports of States, compared with similar data for large cities. There will be found, also, tables showing for the calendar years 1915 and 1916 the numbers of cases and deaths reported, together with the indicated case rates per 1,000 population, fatality rates per 100 cases reported, and death rates per 1,000 population for diphtheria, measles, scarlet fever, tuberculosis, and typhoid fever.

For the calendar years 1912, 1913, 1914, 1915, and 1916, the Public Health Service, through the Division of Sanitary Reports and Statistics, has also compiled and published annual statements of the prevalence of certain notifiable diseases in cities of the United States having a population of 10,000 or more.

These summaries have covered the numbers of cases recorded, and of deaths registered, the indicated case rates per 1,000 population, the indicated fatality rates per 100 cases; and for the year 1916 in the cities of over 100,000 population the indicated death rates per 1,000 inhabitants for diphtheria, measles, scarlet fever, tuberculosis (pulmonary), tuberculosis (all forms), and typhoid fever.

Reports for the calendar year 1916 were received from all of the 66 cities of over 100,000 population, excepting Cambridge, Mass., and Memphis, Tenn. The reports represent 98.9 per cent of the aggregate population of the cities of this group. The cities of this group that reported, with their population as estimated for July 1, 1916, are:

Over 500,000 inhabitants:	Population.
Baltimore, Md	589,621
Boston, Mass	756,476
Chicago, Ill	2,497,722
Cleveland, Ohio	674,073
Detroit, Mich	571,784
Los Angeles, Cal	503,812
New York, N. Y	5,602,841
Philadelphia, Pa	1,709,518
Pittsburgh, Pa	579,090
St. Louis, Mo	757,309
From 300,000 to 500,000 inhabitants:	
Buffalo, N. Y	468,558
Cincinnati, Ohio	410,476
Jersey City, N. J	306,345
Milwaukee, Wis	436,535
Minneapolis, Minn	363,454
Newark, N. J	408,894
New Orleans, La	371,747
From 300,000 to 500,000 inhabitants—Continued.	Population.
San Francisco, Cal	463,516
Seattle, Wash	348,639
Washington, D. C	363,980
From 200,000 to 300,000 inhabitants:	
Columbus, Ohio	214,878
Denver, Colo	260,800
Indianapolis, Ind	271,708
Kansas City, Mo	297,847
Louisville, Ky	238,910
Portland, Oreg	295,463
Providence, R. I	254,960
Rochester, N. Y	256,417
St. Paul, Minn	247,232
From 100,000 to 200,000 inhabitants:	
Albany, N. Y	104,199
Atlanta, Ga	190,558

From 100,000 to 200,000 inhabitants—Continued.	Population.
Birmingham, Ala	181,762
Bridgeport, Conn	121,579
Camden, N. J	106,233
Dallas, Tex	124,527
Dayton, Ohio	127,224
Des Moines, Iowa	101,598
Fall River, Mass	128,366
Fort Worth, Tex	104,562
Grand Rapids, Mich	128,291
Hartford, Conn	110,900
Houston, Tex	112,307
Lawrence, Mass	100,560
Lowell, Mass	113,245
Lynn, Mass	102,425
Nashville, Tenn	117,057
New Bedford, Mass	118,158
New Haven, Conn	149,685

From 100,000 to 200,000 inhabitants—Continued.	Population.
Oakland, Cal	198,604
Omaha, Nebr	165,470
Paterson, N. J	138,443
Reading, Pa	109,381
Richmond, Va	156,687
Salt Lake City, Utah	117,399
San Antonio, Tex	123,831
Scranton, Pa	146,811
Spokane, Wash	150,323
Springfield, Mass	105,942
Syracuse, N. Y	155,624
Tacoma, Wash	112,770
Toledo, Ohio	191,554
Trenton, N. J	111,593
Worcester, Mass	163,314
Youngstown, Ohio	108,385

Reports giving data similar to those above outlined were also furnished by 40 of the 62 cities having populations of from 50,000 to 100,000.

The cities of this group from which reports were received are:

Atlantic City, N. J.
Augusta, Ga.
Bayonne, N. J.
Berkeley, Cal.
Binghamton, N. Y.
Brockton, Mass.
Canton, Ohio.
Covington, Ky.
Duluth, Minn.
Elizabeth, N. J.
El Paso, Tex.
Erie, Pa.
Evansville, Ind.
Flint, Mich.
Fort Wayne, Ind.
Harrisburg, Pa.
Hoboken, N. J.
Holyoke, Mass.
Lancaster, Pa.
Malden, Mass.
Manchester, N. H.
Mobile, Ala.
New Britain, Conn.
Oklahoma City, Okla.
Passaic, N. J.
Pawtucket, R. I.
Portland, Me.
Rockford, Ill.
Saginaw, Mich.
St. Joseph, Mo.
San Diego, Cal.
Schenectady, N. Y.
Somerville, Mass.
Tampa, Fla.
Troy, N. Y.
Utica, N. Y.
Wichita, Kans.
Wilkes-Barre, Pa.
Yonkers, N. Y.
York, Pa.

Of the cities having populations of from 25,000 to 50,000, 83 reported. In the group of cities of from 10,000 to 25,000 population 149 reported for the year. Many of the smaller cities do not have health officers. Many have inadequate clerical forces in the health departments or their records are not so kept that the data are readily available.

ANTHRAX IN MAN.

From reports received it appears that either cases of anthrax in man were more numerous in the United States during the year from July 1, 1916, to June 30, 1917, than in previous years or the cases were better reported. In Massachusetts, during the years 1907 to 1915 the total number of cases reported was 64, from February to June, 1915, the total was 25 cases, and during the period from September, 1916, to June, 1917, 31 cases were reported. In Louisiana one case was reported in September, 1916, and for the month of June, 1917, 10 cases were reported. In California 7 cases were reported during the period from September to December, 1916. In New York 6 cases were reported from August, 1916, to March, 1917. New Jersey reported 6 cases from December, 1916, to June, 1917. Two cases were reported in Kansas, one in December, 1916, and one in June,

1917. One case was reported in Connecticut and one in West Virginia during the month of December, 1916.

Data concerning the source of infection were furnished for only a few of the cases reported, but enough has been learned to indicate that the infection in the cases reported in the eastern States was received in many instances in the handling of imported hides. The infection in cases reported from other localities, especially those in Louisiana, was received from domestic animals sick or dead from anthrax.

The collection of detailed information of cases of anthrax in man is being carried on. An effort is also being made to ascertain the relation of its prevalence among animals to its occurrence in man.

DENGUE.

Dengue was prevalent in Brownsville, Tex., in July, and in Eagle Pass during the months of September and October, 1916. During the calendar year 1916, a total of 969 cases of dengue was reported in Texas.

DIPHTHERIA.

Case rates.—The highest reported case rate for diphtheria was that for Massachusetts, with a rate of 1.96 per 1,000 inhabitants. The next highest rates were those of New Jersey and New York, with rates of 1.89 and 1.86, respectively. The lowest reported rates of the States were those of Arizona, Iowa, and Colorado, with rates of 0.15, 0.21, and 0.39, respectively. The low rate in Iowa is probably due at least in part to incomplete data.

Of the cities of over 100,000 population, the highest reported case rates were those of Detroit, St. Louis, and Boston, with 6.33, 3.63, and 3.19, respectively, per 1,000 population. The lowest reported case rates were from Spokane and Seattle, Wash., and Portland, Oreg., with 0.17, 0.24, and 0.44, respectively.

Fatality rates.—For the year 1916, the highest indicated fatality rates were those of Alabama, the Territory of Hawaii, and Iowa, with rates of 25, 22.73, and 20.17, respectively, per 100 reported cases. The lowest fatality rates reported were those of Louisiana, the District of Columbia, and Minnesota, with rates of 4.96, 5.10, and 7.25, respectively, per 100 cases reported.

The highest fatality rates recorded in the larger cities were those of Reading, New Haven, and Philadelphia, with indicated rates of 16.90, 16.06, and 15.33, respectively, per 100 cases reported. The lowest rates were in Fort Worth, Denver, and Richmond, with 1.59, 1.64, and 2.05, respectively.

Death rates.—Among the States the highest death rates per 1,000 population from diphtheria were those of the Territory of Hawaii and the States of Michigan and New Jersey, with rates of 0.162, 0.159, and 0.151, respectively. The lowest rates were in Louisiana, Iowa, Mississippi, and Montana, with rates of 0.028, 0.043, 0.072, and 0.072, respectively.

In the larger cities the highest death rates reported were those of Detroit, Lowell, and Providence, with rates of 0.453, 0.362, and 0.298, respectively. The lowest rates were in Spokane, Fort Worth, and Denver, with rates of 0.007, 0.010, and 0.012, respectively.

Diphtheria—Cases reported, and case and fatality rates, in States in which the prevalence of the disease is recorded, 1915 and 1916.

	Estimated population July 1, 1916.	1916					1915				
		Total cases reported.	Deaths registered.	Case rate per 1,000.	Fatality per cent.	Death rate per 1,000.	Total cases reported.	Deaths registered.	Case rate per 1,000.[1]	Fatality per cent.	Death rate per 1,000.[2]
Alabama	2,332,608	752	188	0.322	[3] 25.00	0.081	590	204	0.256	[3] 34.58	
Arizona	255,544	39	(4)	.153			109	34	.441	[3] 31.19	
California	2,938,654	3,091	290	1.052	9.38	.099	3,660	311	1.285	8.50	
Colorado	962,060	372	(4)	.387							
Connecticut	1,244,479	1,870	187	1.503	10.00	.150	2,161	193	1.766	8.93	
District of Columbia	363,980	647	33	1.778	5.10	.091	644	28	1.795	4.35	
Hawaii	215,741	154	35	.714	[3] 22.73	.162	133	32	.575	[3] 24.06	
Indiana	2,816,817	3,190	384	1.132	[3] 12.04	.136	[5] 2,946	297	1.053	10.08	
Iowa	2,220,321	476	96	.214	[3] 20.17	.043					
Kansas	1,829,545	1,647	195	.900	11.84	.107	2,564	245	1.419	9.56	
Louisiana	1,829,130	1,049	52	.573	4.96	.028	152	(4)	.084		
Maine	772,489	455	(4)	.589							
Maryland	1,362,807	1,884	166	1.382	8.81	.122	2,541	(4)	1.880		
Massachusetts	3,719,156	7,282	557	1.958	7.65	.150					
Michigan	3,054,854	5,520	486	1.807	8.81	.159	2,249	338	1.409	7.95	
Minnesota	2,279,603	2,345	170	1.029	7.25	.075	2,657	190	1.178	7.18	
Mississippi	1,951,674	1,096	141	.562	12.86	.072	1,092	(4)	.567		
Montana	459,494	226	33	.492	14.60	.072					
Nevada							1	1	.010	[3] 100.00	
New Jersey	2,948,017	5,580	444	1.893	7.96	.151	6,941	501	2.409	7.22	
New York	10,273,375	19,133	1,518	1.862	7.93	.148	20,806	1,754	2.063	8.43	
Ohio	5,150,356	7,686	(4)	1.492			8,962	(4)	1.761		
Oklahoma							2,298	193	1.087	8.40	
Oregon	835,741	190	14	.227	7.37	.017	373	25	.461	6.70	
Pennsylvania	8,522,017	14,191	1,633	1.665	11.51	.192					
Porto Rico							186	30	.157	16.13	
Rhode Island	614,315	1,073	125	1.747	11.65	.203					
South Carolina	1,625,475	1,164	79	.716	6.79	.049	1,947	91	1.211	4.67	
Texas							2,433	436	.560	17.92	
Utah							477	47	1.124	9.85	
Vermont	363,699	446	23	1.226	5.16	.063	557	37	1.537	6.64	
Virginia	2,192,019	2,906	244	1.326	8.40	.111	5,195	(4)	2.393		
Washington	1,534,221	389	35	.254	9.00	.023	406	37	.276	9.11	
West Virginia							688	34	.506	4.94	
Wisconsin	2,500,350	1,981	213	.792	10.75	.085	1,699	186	.687	10.95	
Wyoming	179,559	30	5	.167	16.67	.028	20	6	.109	[3] 30.00	

[1] The computations of case rates for 1915 were made on the basis of estimated population July 1, 1915.
[2] Not computed for 1915.
[3] A fatality rate as high as this indicates that the cases have not been completely reported.
[4] Deaths were not reported.
[5] The health officer states that cases are known not to be completely reported.

DYSENTERY.

From the middle of October to the end of November, 1916, there occurred in Talladega, Ala., a dysentery-like epidemic which subsided rapidly after the city made a change in the water supply from a polluted spring to an artesian well.

In May and June, 1917, there was an outbreak of dysentery, principally among children under 5 years of age, in the northeastern part of Arkansas, first reported at Blytheville and in neighboring communities in Mississippi County. The epidemic spread to several counties in the southeastern section of Missouri and extended also to near-by territory in Tennessee and Mississippi. The past experience of physicians seems to indicate that similar outbreaks have been of annual occurrence, although the epidemic is believed to have been of unusual severity this year, as many cases have been fatal. There are, however, no records to show either the number of cases that occurred or the number of deaths resulting therefrom. On July 22, 1917, the outbreak was reported as subsiding.

LEPROSY.

Special schedules were sent to the health departments of States and to cities having a population of over 10,000 asking for information regarding the known occurrence of leprosy in their respective jurisdictions during the calendar year 1916. The following tables give the information of the prevalence of the disease collected in this way. It is probable that there were a few known cases in cities from which no reports were received. Undoubtedly there were also a number of cases which were not reported because their existence was unknown to the health departments.

Reports of leprosy, by States, for 1916.

State.	Present Jan. 1, 1916.	Reported during 1916.	Died or removed, 1916.	Present Dec. 31, 1916.	Isolated under State control.	Isolated under local control.
Arkansas	.....	1	1	.....	.....	.....
California	24	13	14	23	.....	23
Alameda County	.....	.....	.....	3	.....	3
Los Angeles County	.....	.....	.....	2	.....	2
San Francisco County	.....	.....	.....	17	.....	17
Tulare County	.....	.....	.....	1	.....	1
Colorado:						
Pueblo	.....	1	.....	1	.....	1
Connecticut:						
Ansonia	.....	1	.....	1	.....	1
District of Columbia	1	.....	.....	1	1	.....
Hawaii	736	82	115	703	703	.....
Molokai—						
Kalawao	.....	.....	.....	670	670	.....
Oahu—						
Honolulu (Kalihi Hospital)	.....	.....	.....	33	33	.....
Indiana:						
Fort Branch	.....	1	.....	1	.....	1
Louisiana	105	21	36	106	91	.....
Carville (State Leper Home)	105	21	36	91	91	.....
Lake End	.....	.....	.....	1	.....	.....
Mansfield	.....	.....	.....	1	.....	.....
New Orleans	.....	.....	.....	13	.....	.....
Maryland:						
Curtis Bay (quarantine station)	.....	1	.....	1	.....	1

Reports of leprosy, by States, for 1916—Continued.

State.	Present Jan. 1, 1916.	Reported during 1916.	Died or removed, 1916.	Present Dec. 31, 1916.	Isolated under State control.	Isolated under local control.
Massachusetts:						
Dukes County (Penikese Hospital)	12	2	5	9	9	
Minnesota	10		1	9		9
Cokato, Wright County				1		1
Montevideo, Chippewa County				1		1
Linden Township, Brown County				1		1
Minneapolis, Hennepin County				2		2
Albert Lea, Freeborn County				1		1
Elbow Lake, Grant County				1		1
St. Paul, Ramsey County				1		1
Moscow Township, Freeborn County				1		1
Montana		1	1			
New Jersey:						
Newark		1		1		1
Ohio:						
Dayton (quarantine hospital)		1		1		1
Huron County		1	1			
Philippine Islands	4,472	932	468	4,936	4,419	122
Culion Leper Colony				4,265	4,265	
San Lazaro Hospital				154	154	
In various Provinces				122		122
Estimated in Provinces				395		
South Carolina	1	1		2		2
Georgetown County				1		1
McCormick County				1		1
Utah:						
Salt Lake City (county hospital)		1		1		1
Washington		2	1	1		1
Bellingham		1		1		1

Reports of leprosy, by cities, for 1916.

City.	Present 1916.	Reported during 1916.	Died or removed, 1916.	Present Dec. 31, 1916.	Isolated under local control.
Baltimore, Md		1		1	1
Bellingham, Wash		2	1	1	1
Boston, Mass		2	2		
Chicago, Ill	1	1	1	[1] 1	
Cleveland, Ohio		1	1		
Dayton, Ohio		1		1	1
Galveston, Tex		1	1		
Indianapolis, Ind		1	[2] 1		
Jersey City, N. J	1			1	1
Los Angeles, Cal	6	6	8	4	[3] 4
Milwaukee, Wis		1	1		
Minneapolis, Minn		1	1		
Newark, N. J		1		1	1
New Haven, Conn		1		1	1
New Orleans, La		17	17		
New York, N. Y	20	7	10	17	[4] 13
Oakland, Cal		1	[5] 1		
Passaic, N. J	1			1	1
Philadelphia, Pa	1			1	1
Richmond, Va	1			1	1
St. Louis, Mo	2			2	
San Francisco, Cal	14	5	2	17	17
Seattle, Wash		1	[6] 1		
Washington, D. C	[7] 1			1	1
Wilkes-Barre, Pa	1			[8] 1	
Williamsport, Pa		1		1	1
Woburn, Mass		1	1		

[1] Escaped from quarantine.
[2] Fort Branch case (*see* Indiana State report).
[3] In custody of Los Angeles County authorities.
[4] 2 cases under observation, but not confined.
[5] Removed to county infirmary.
[6] Patient exported to Greece at expense of city.
[7] The same case as that in District of Columbia, in the State table.
[8] In care of the Luzerne County central poor district.

Copies of the special leprosy report schedules sent to health officers of States and of cities follow:

LEPROSY REPORT—CALENDAR YEAR 1916.

State of _____

Number of known cases in State, January 1, 1916, _____.
Number of new cases reported during the calendar year 1916, _____.
Number of cases that died or left the State during the year, _____.
Number of known cases in the State, December 31, 1916, _____.
Number of cases isolated under State control, December 31, 1916, _____.
Number of cases isolated under local control, December 31, 1916, _____.
Location of cases present in State, December 31, 1916.
Town or county—

_____, _____ cases.
_____, _____ cases.
_____, _____ cases.
_____, _____ cases.
_____, _____ cases.
_____, _____ cases.
_____, _____ cases.
_____, _____ cases.
_____, _____ cases.
_____, _____ cases.

_____
(Date.)
_____, *Health Officer.*
_____, *Collaborating Epidemiologist.*

To the SURGEON GENERAL,
United States Public Health Service,
Washington, D. C.

LEPROSY REPORT—CALENDAR YEAR 1916.

City of _____

Number of known cases in city, January 1, 1916, _____.
Number of new cases reported during the calendar year 1916, _____.
Number of cases that died or removed during the year, _____.
Number of known cases in city, December 31, 1916, _____.
Number of cases isolated under municipal control, December 31, 1916, _____.
Remarks: _____

_____
(Date.)

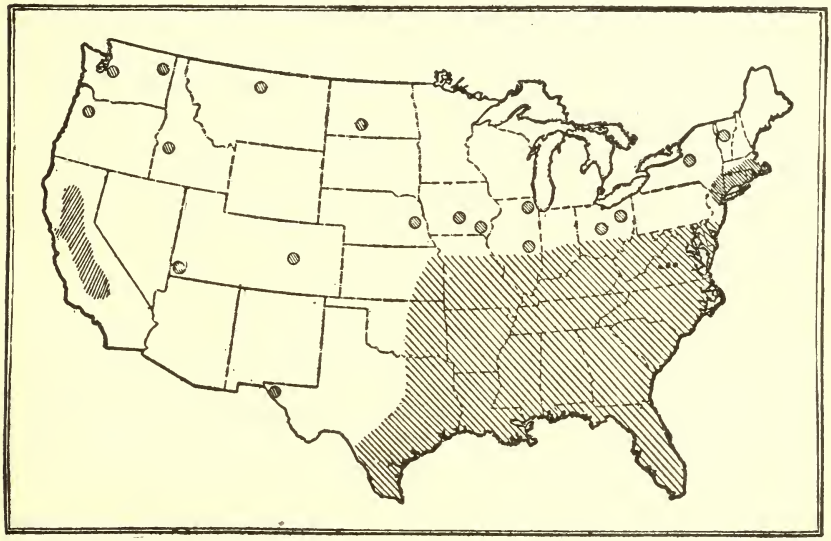
_____
(City Health Officer.)

To the SURGEON GENERAL,
United States Public Health Service,
Washington, D. C.

MALARIA.

The Public Health Service has for the last four years circularized the physicians of most of the Southern States to ascertain as definitely as this means would allow the prevalence of malaria. To determine its geographic distribution elsewhere circular letters of inquiry were sent recently to the health departments of all the other

States and of cities of over 10,000 population. The records of the occurrence of malaria at Army posts were also consulted. The mortality records of the registration area for deaths were examined, but, naturally, gave little information of value, for the reason that malaria may be prevalent without appearing in the records of deaths. This is illustrated by the fact that between 1904 and 1914 there were in the Army in the continental United States, exclusive of Alaska, over 13,000 cases of malaria, while during this time there were only two deaths due to the disease. Between 1907 and 1914 there were over 7,000 cases without a death. Then, too, in civil life malaria frequently is given as a cause of death when the deceased was affected with some condition other than malaria. This is true both in ma-



Endemic areas of malaria.—Shaded portions of map show endemic areas. Shaded circles represent localities in which cases of malaria occur and in which the disease is probably endemic.

larious localities and in localities where the disease does not exist. And as malaria appears comparatively infrequently in mortality records at most, it is impossible by this means to separate malarious from nonmalarious localities.

As to the geographic distribution of malaria in the United States at the present time, there are three principal well-recognized endemic areas—one large area and two smaller ones. The large endemic area covers the whole southeastern portion of the United States, having for its southern boundary the Gulf of Mexico; for its western boundary, a line drawn from Eagle Pass, on the Rio Grande, to Leavenworth, Kans.; for its eastern boundary, the Atlantic seaboard; its northern boundary, a line drawn from Leavenworth, Kans., eastward some distance north of the Ohio River and extending to the Atlantic on a line with the northern boundary of Maryland. Of the two smaller endemic areas, one includes a section of the northern part of New Jersey, southeastern New York, Connecticut, Rhode Island, and part of the State of Massachusetts. The third recognized en-

demic area is in California, and includes the Sacramento and San Joaquin Valleys, which occupy a large portion of the central part of the State. It is probable that the New England endemic area actually extends southward to the large southern area of which it is in reality a part.

As indicated by reports received from State and city health departments and the records of Army posts, there are lesser endemic areas scattered here and there in many other States. (See map.)

The records of the Army posts are not without interest. Fort Washington, Md., had for several years up to 1913 the highest malaria sick rate of any post in the United States. The admission rate varied from 736 to 1,000 mean strength in 1906 to 172 per 1,000 in 1912.

While the malaria rate in the Army has steadily declined during recent years, it is suggested that the causes are the improved conditions at the posts, better barracks, and greater attention to screening and drainage, also that the troops still suffer from the infection present in localities surrounding many of the posts.

In 1914 the highest malaria rate at any Army post in the United States was 73 per 1,000 mean strength at Washington Barracks in the District of Columbia. The second highest was at Fort Myer, Va., just outside of Washington, and the third highest at Leavenworth, Kans.

MEASLES.

Alaska.—A considerable prevalence of measles was reported in Alaska. During the month of August, 1916, 23 cases occurred at Possession Point, and from December 15, 1916, to February 17, 1917, 87 cases were reported at Ketchikan. Reports indicated that the southeastern section of Alaska was quite generally affected, with high rates in many of the towns and villages. At Yakutat 128 cases occurred among a population of 145 persons.

Case rates.—The highest case rates for measles reported by States for the calendar year 1916 were those of Virginia, Pennsylvania, and Washington, with 11.85, 11.67, and 11.03, respectively, per 1,000 population. The lowest case rates among the States reporting were those for Alabama, Arizona, and Mississippi, with 0.09, 0.37, and 0.87, respectively.

Of the cities of over 100,000 population the highest reported case rates per 1,000 were those of Richmond, Salt Lake City, and Youngstown, with rates of 43.30, 34.22, and 26.45, respectively. The lowest rates of 0.22, 0.39, and 0.59 for Oakland, Birmingham, and Cincinnati, respectively, probably indicate an incomplete notification of cases.

Fatality rates.—The highest fatality rates per 100 reported cases were those of the Territory of Hawaii, Rhode Island, and Michigan, with rates of 8.12, 6.28, and 3.20, respectively. The lowest rates were 0.23, 0.32, and 0.33 in the District of Columbia, Louisiana, and Montana, respectively.

Among the large cities, the highest fatality rates were in Providence, Detroit, and Worcester, with rates of 7.86, 5.57, and 4.72, respectively, per 100 cases, while the lowest were in Denver, Seattle, Indianapolis, and Dayton, with rates of 0.11, 0.17, 0.20, and 0.20, respectively.

Death rates.—Among the States from which deaths were reported the highest death rates per 1,000 population were in the Territory of Hawaii, Rhode Island, and Virginia, with rates of 0.61, 0.22, and 0.18, respectively. The lowest death rates were in Alabama, Louisiana, and Mississippi, with rates of 0.001, 0.007, and 0.007, per 1,000.

The highest death rates in cities of more than 100,000 population were rates per 1,000 residents of 0.39 in Youngstown, 0.36 in Toledo, and 0.34 in Hartford. The lowest rates were 0.005 in Cincinnati, 0.008 each in Denver and in Dallas.

Measles—Cases reported, and case and fatality rates, in States in which the prevalence of the disease is recorded, 1915 and 1916.

	Estimated population July 1, 1916.	1916					1915				
		Total cases reported.	Deaths registered.	Case rate per 1,000.	Fatality per cent.	Death rate per 1,000.	Total cases reported.	Deaths registered.	Case rate per 1,000.[1]	Fatality per cent.	Death rate per 1,000.[2]
Alabama	2,332,608	219	3	0.094	1.37	0.001	1,333	47	0.579	3.53	.....
Arizona	255,544	94	[3]	.368	.....	.....	41	21	.166	[4] 51.22	.....
California	2,938,654	4,268	41	1.452	.96	.014	13,114	128	4.604	.97	.....
Colorado	962,060	4,148	[3]	4.312	.....	.....	.....	.....	.....	.....	.....
Connecticut	1,244,479	10,426	139	8.378	1.33	.112	3,499	56	2.860	1.60	.....
District of Columbia	363,980	2,642	6	7.259	.23	.016	1,940	5	5.409	.26	.....
Hawaii	215,741	1,614	131	7.481	[4] 8.12	.607	1,279	31	5.532	2.42	.....
Indiana	2,816,817	22,765	204	8.082	.90	.072	[5] 7,922	73	2.831	.92	.....
Iowa	2,220,321	.....	218	.....	.....	.098	.....	.....	.....	.....	.....
Kansas	1,829,545	13,836	158	7.563	1.14	.086	7,118	65	3.939	.91	.....
Louisiana	1,829,130	4,037	13	2.207	.32	.007	99	[3]	.055	.....	.....
Maine	772,489	1,342	[3]	1.737	.....	.....	.....	.....	.....	.....	.....
Maryland	1,362,807	10,670	106	10.765	.72	.078	2,895	[3]	2.141	.....	.....
Massachusetts	3,719,156	25,460	388	6.846	1.52	.104	.....	.....	.....	.....	.....
Michigan	3,054,854	10,744	344	3.517	3.20	.113	3,743	94	1.241	2.51	.....
Minnesota	2,279,603	[3] 9,480	254	4.159	2.68	.111	[5] 3,210	[3]	1.429	.....	.....
Mississippi	1,951,674	1,691	13	.866	.77	.007	2,951	[3]	1.532	.....	.....
Montana	459,494	3,300	11	7.182	.33	.024	.....	.....	.....	.....	.....
Nevada	.....	.....	.....	.....	.....	.....	18	[3]	.175	.....	.....
New Jersey	2,948,017	.....	344	.....	.....	.117	.....	.....	.....	.....	.....
New York	10,273,375	67,010	913	6.523	1.36	.089	62,660	834	6.212	1.33	.....
Ohio	5,150,356	53,966	[3]	10.478	.....	.....	19,388	[3]	3.810	.....	.....
Oklahoma	.....	.....	.....	.....	.....	.....	939	11	.444	1.17	.....
Oregon	835,741	1,790	10	2.143	.56	.012	399	6	.493	1.50	.....
Pennsylvania	8,522,017	99,424	1,467	11.667	1.48	.172	.....	.....	.....	.....	.....
Rhode Island	614,315	2,133	134	3.472	[4] 6.28	.218	.....	.....	.....	.....	.....
South Carolina	1,625,475	1,859	25	1.144	1.34	.015	46	4	.029	8.70	.....
Texas	.....	.....	.....	.....	.....	.....	164	48	.038	[4] 29.27	.....
Utah	.....	.....	.....	.....	.....	.....	172	4	.405	2.33	.....
Vermont	363,699	2,548	25	7.006	.98	.069	361	3	.996	.83	.....
Virginia	2,192,019	25,964	400	11.845	1.54	.182	3,990	[3]	1.838	.....	.....
Washington	1,534,221	16,924	78	11.031	.46	.051	[5] 1,443	16	.981	1.11	.....
West Virginia	.....	.....	.....	.....	.....	.....	427	1	.314	.23	.....
Wisconsin	2,500,350	16,153	172	6.460	1.06	.069	4,425	24	1.789	.54	.....
Wyoming	179,559	552	2	3.074	.36	.011	540	1	3.101	.19	.....

[1] The computations of case rates for 1915 were made on the basis of estimated population July 1, 1915.
[2] Not computed for 1915.
[3] Deaths were not reported.
[4] A fatality rate as high as this indicates that the cases have not been completely reported.
[5] The health officer states that cases are known not to be completely reported.

MENINGITIS (EPIDEMIC CEREBROSPINAL).

Reports received during the first six months of 1917 indicated unusual prevalence of cerebrospinal meningitis in several States. The greatest incidence of the disease occurred during the period from March 1 to the end of May.

From the first of March until about the end of the first week of May cases were reported by States as follows: Connecticut 148, District of Columbia 10, Illinois 73, Maryland 18, Massachusetts 30, Minnesota 169, New York 123, Rhode Island 17, and Wisconsin 36. In Indiana 22 cases were reported during the month of March. In Kansas 40 cases were reported from March 1 to April 30. In Ohio 79 cases were reported in April, and in Pennsylvania 284 cases from January 1 to April 30.

The total numbers of cases reported from those cities that showed the most cases for the period from January 1 to the end of May were as follows: Philadelphia 336, New York 188, Minneapolis 129, Hartford and St. Louis 122 each, and Cleveland 94. In Akron, Ohio, 55 cases were reported during the month of April.

During the calendar year 1916 there were 26 States which kept records of cerebrospinal meningitis and furnished the data in their reports to the bureau. Of these States, those reporting the greatest number of cases were New York, with 327 cases; Pennsylvania, with 162 cases; and Virginia, with 153 cases reported as cases, but there were in Virginia 292 cases that were recorded as deaths. Wisconsin had 111 cases reported as such, but there were 389 cases recorded only as deaths. This shows defective notification of this disease.

Among the larger cities, 263 cases were reported in New York, 110 cases in Chicago, 69 in Philadelphia, 64 in Boston, 62 in St. Louis, 46 in Cleveland, 39 in Bridgeport, 37 in Newark, and 29 in Detroit.

Meningitis—Cases reported, and case and fatality rates, in States in which the prevalence of the disease is recorded, 1915 and 1916.

	Estimated population July 1, 1916.	1916				1915.			
		Total cases reported.	Deaths registered.	Case rate per 1,000.	Fatality per cent.	Total cases reported.	Deaths registered.	Case rate per 1,000.[1]	Fatality per cent.
Alabama	2,332,608	45	19	0.019	42.22	38	13	0.017	34.21
Arizona						1	(2)	.004	
California	2,938,654	64	14	.022	21.88	46	22	.016	47.83
Colorado	962,060	2	(2)	.002					
Connecticut	1,244,479	73	32	.059	43.84	35	17	.029	48.57
District of Columbia	363,980	7	4	.019	57.14	5	5	.014	100.00
Hawaii	215,741	14	8	.065	57.14	3	(2)	.013	
Indiana	2,816,817	30	52	.011		[3] 71	59	.025	83.10
Iowa	2,220,321	14	35	.006					
Kansas	1,829,545	54	(2)	.030		[3] 36	(2)	.020	
Louisiana	1,829,150	25	39	.014		12	1	.007	8.33
Maine	772,489	1	(2)	.001					
Maryland	1,362,807	44	14	.032	31.82	57	(2)	.042	
Massachusetts	3,719,156	150	132	.040	88.00				
Minnesota	2,279,603	[3] 46	24	.020	52.17	[3] 35	14	.016	40.00
Mississippi	1,951,674	30	(2)	.015		67	(2)	.018	
Montana	459,494	10	60	.122					
Nevada						10	10	.097	100.00
New York	10,273,375	327	284	.032	86.85	288	265	.029	92.01
Ohio	5,150,356	152	(2)	.030		187	(2)	.037	
Oregon	835,741	3	1	.004	33.33				
Pennsylvania	8,522,017	162	(2)	.019					
Rhode Island	614,315	21	21	.034	100.00				
South Carolina	1,625,475	12	23	.007		14	50		
Vermont	363,699	7	4	.019	57.14				
Virginia	2,192,019	153	292	.070		272	(2)	.125	
Washington	1,534,221	11	40	.007		13	39		
West Virginia						13	9	.010	69.23
Wisconsin	2,500,350	111	389	.044		74	336		
Wyoming	179,559	10	10	.056	100.00				

[1] The computations of case rates for 1915 were made on the basis of estimated population July 1, 1915.
[2] Deaths were not reported.
[3] The health officer states that cases are known not to be completely reported.

POLIOMYELITIS (INFANTILE PARALYSIS).

The year 1916 was one characterized by an unusual prevalence of poliomyelitis (infantile paralysis) throughout the United States. In many localities the disease became epidemic. Poliomyelitis has been with us for several decades, occasional cases being reported here and there throughout the country during all months of the year. There have usually been more cases in the summer than in the winter months.

The principal epidemic area last year comprised northern New Jersey, southeastern New York, and most of Connecticut, Massachusetts, and Rhode Island. Special interest in the disease was aroused about the 1st of July by its unusual prevalence in New York City.

The New York City epidemic began about the middle of June. Early in July increasing numbers of cases were being reported in Newark and Jersey City, N. J., and neighboring communities. By July 15 the disease was on the increase in Philadelphia, Pa.; Bridgeport, Conn.; Camden, N. J.; and Toledo, Ohio. By the 1st of August cases were being reported in Baltimore, Md.; Boston, Mass.; Chicago, Ill.; St. Paul and Minneapolis, Minn.; Providence, R. I.; Syracuse, N. Y.; and Trenton, N. J. The disease was at its height in July, August, and September. In December, after the disease had subsided elsewhere, an outbreak developed in the northeastern part of West Virginia with foci at Elkins, Grafton, and Fairmont.

The localities which were particularly invaded during 1916 are shown on the map on page 272. Billings, Mont., which is not on the map, also had a considerable outbreak in proportion to its population.

The table on page 272 shows the number of cases reported monthly by States. It will be noted that a greater number of cases was reported during the first four months of the year in Virginia than in any other State. In a few of the States there was an increase in the occurrence of the disease during May and June, but in most of the States the distinct increase began in July, and in Maine and Vermont not until August. The highest reported case rate for the year was in New Jersey, where there was a rate of 1.376 per thousand population. The next highest rate was that of New York State with a rate of a little under 1.3 per thousand population. Connecticut came next with a reported rate of 0.764 and Massachusetts with a rate of 0.518. Rhode Island was about as heavily infected as Connecticut and Massachusetts. Maryland, Michigan, Minnesota, Montana, and Pennsylvania had reported case rates of between 0.2 and 0.5 per thousand population. The other States in which records of the prevalence of the disease were kept had reported case rates of less than 0.2 per thousand.

Cases of poliomyelitis reported by States, 1916.

State.	Jan. 1 to Apr. 30.	May.	June.	July.	August.	September.	October.	November.	December.	Total cases.	Case rate per 1,000 population.
Alabama	4	3	8	77	65	13	8	4	4	186	0.080
Arizona	1	.....	.....	1	1	1	2	.....	.....	6	.023
California	14	2	4	12	19	14	21	25	21	132	.045
Colorado	1	.....	1	2	2	4	6	.....	.....	16	.017
Connecticut	8	1	4	165	367	274	91	30	11	951	.764
District of Columbia	1	1	.....	8	18	6	5	.....	.....	39	.107
Indiana	.....	1	1	25	38	64	57	16	5	207	.073
Iowa	8	.....	4	32	86	66	32	25	6	259	.117
Kansas	5	.....	2	12	23	21	26	8	6	103	.056
Louisiana	18	3	6	25	9	5	3	5	3	77	.042
Maine	.....	.....	.....	.....	15	56	42	30	6	149	193
Maryland	5	.....	.....	10	65	103	121	43	5	352	.258
Massachusetts	16	4	10	106	252	622	701	179	36	1,926	.518
Michigan	16	4	7	62	183	195	101	29	19	616	.202
Minnesota	6	9	19	232	337	193	90	19	4	[1] 909	.399
Mississippi	36	36	57	59	31	14	10	8	18	269	.138
Montana	.....	.....	1	11	28	33	13	6	2	94	.205
New Jersey	7	2	4	647	2,126	964	258	41	6	4,055	1.376
New York	30	16	345	4,054	5,773	2,201	643	122	39	13,223	1.287
Ohio	31	2	7	100	172	147	62	18	7	546	.106
Oregon	2	.....	.....	.....	.....	5	26	4	1	38	.045
Pennsylvania	10	3	9	120	747	804	379	83	26	2,181	.256
South Carolina	1	1	.....	20	58	24	13	6	.....	123	.076
Texas	.....	.....	6	22	25	19	6	1	7	86	.019
Vermont	5	.....	1	.....	11	20	22	2	3	64	.176
Virginia	51	28	11	24	44	64	48	46	14	330	.151
Washington	1	.....	1	5	2	12	5	2	2	30	.020
West Virginia	7	.....	.....	5	13	18	18	4	17	[1] 82	.059
Wisconsin	3	.....	.....	20	174	163	87	19	9	475	.190
Wyoming	.....	.....	.....	.....	2	3	.....	1	1	7	.039

[1] The health officer states that cases are known not to be completely reported.

Shaded areas show localities particularly involved in the poliomyelitis epidemic of 1916.

The number of cases reported in cities having over 100,000 population are given in the table on page 273. A list of smaller cities, also, in which five or more cases of the disease were reported, together with the number of cases, will be found on page 274.

Poliomyelitis (infantile paralysis).[1]*—Reports of cities of over 100,000 population, 1916.*

City.	Estimated population July 1, 1916.	Cases reported.	Deaths registered.	Indicated case rate per 1,000 inhabitants.	Indicated fatality rate per 100 cases.
Over 500,000 inhabitants:					
Baltimore, Md	589,621	205	70	0.348	34.15
Boston, Mass	756,476	651	159	.861	24.42
Chicago, Ill	2,497,722	285	49	.114	17.19
Cleveland, Ohio	674,073	38	6	.056	15.79
Detroit, Mich	571,784	60	16	.105	26.67
Los Angeles, Cal	503,812	19	4	.038	21.05
New York, N. Y	5,602,841	9,023	2,448	1.610	27.13
Philadelphia, Pa	1,709,518	1,006	307	.588	30.52
Pittsburgh, Pa	579,090	34	12	.059	35.29
St. Louis, Mo	757,309	23	19	.030	82.61
From 300,000 to 500,000 inhabitants:					
Buffalo, N. Y	468,558	[2] 13	5	.028	38.46
Cincinnati, Ohio	410,476	47	4	.115	8.51
Jersey City, N. J	306,345	193	31	.630	16.06
Milwaukee, Wis	436,535	16	2	.037	12.50
Minneapolis, Minn	363,454	121	11	.333	9.09
Newark, N. J	408,894	1,422	375	3.478	26.37
New Orleans, La	371,747	22	2	.059	9.09
San Francisco, Cal	463,516	31	2	.067	6.45
Seattle, Wash	348,639	8	.....	.023	.....
Washington, D. C	363,980	39	6	.107	15.38
From 200,000 to 300,000 inhabitants:					
Columbus, Ohio	214,878	11	3	.051	27.27
Denver, Colo	260,800	7	.....	.027	.....
Indianapolis, Ind	271,708	21	5	.077	23.81
Kansas City, Mo	297,847	1	.....	.003	.....
Louisville, Ky	238,910	15	1	.063	6.67
Portland, Oreg	295,463	19	2	.064	10.53
Providence, R. I	254,960	118	20	.463	16.95
Rochester, N. Y	256,417	11	2	.043	18.18
St. Paul, Minn	247,232	80	8	.324	10.00
From 100,000 to 200,000 inhabitants:					
Albany, N. Y	104,199	28	4	.269	14.29
Atlanta, Ga	190,558	4	2	.021	50.00
Birmingham, Ala	181,762	20	3	.110	15.00
Bridgeport, Conn	121,579	73	22	.600	30.14
Camden, N. J	106,233	[2] 66	22	.621	33.33
Dallas, Tex	124,527	2	.....	.016	.....
Dayton, Ohio	127,224	17	3	.134	17.65
Des Moines, Iowa	101,598	12	4	.118	33.33
Fall River, Mass	128,366	10	2	.078	20.00
Fort Worth, Tex	104,562	2	.....	.019	.....
Grand Rapids, Mich	128,291	32	6	.249	18.75
Hartford, Conn	110,900	62	10	.559	16.13
Houston, Tex	112,307	4	3	.036	75.00
Lawrence, Mass	100,560	7	2	.070	28.57
Lowell, Mass	113,245	17	4	.150	23.53
Lynn, Mass	102,425	44	14	.430	31.82
Nashville, Tenn	117,057	1	.....	.009	.....
New Bedford, Mass	118,158	21	1	.178	4.76
New Haven, Conn	149,685	95	17	.635	17.89
Oakland, Cal	198,604	2	.....	.010	.....
Omaha, Nebr	165,470	6	.....	.036	.....
Paterson, N. J	138,443	98	20	.708	20.41
Reading, Pa	109,381	5	.....	.046	.....
Richmond, Va	156,687	20	3	.128	15.00
Salt Lake City, Utah	117,399	4	.....	.034	.....
San Antonio, Tex	123,831	7	3	.057	42.86
Scranton, Pa	146,811	17	2	.116	11.76
Spokane, Wash	150,323	1	.....	.007	.....
Springfield, Mass	105,942	88	22	.831	25.00
Syracuse, N. Y	155,624	229	64	1.471	27.95
Tacoma, Wash	112,770	1	1	.010	100.00
Toledo, Ohio	191,554	110	25	.574	22.73
Trenton, N. J	111,593	167	50	1.497	29.94
Worcester, Mass	163,314	25	3	.153	12.00
Youngstown, Ohio	108,385	3	3	.028	100.00

[1] Cities in which no cases of this disease were reported are not included in this table.
[2] The health officer states that cases are known not to be completely reported.

Cases reported by cities of less than 100,000 population, 1916.

From 50,000 to 100,000 population:	Cases.
Atlantic City, N. J	27
Bayonne, N. J	44
Binghampton, N. Y	7
Duluth, Minn	6
Elizabeth, N. J	71
El Paso, Tex	5
Erie, Pa	7
Evansville, Ind	7
Flint, Mich	44
Hoboken, N. J	10
Holyoke, Mass	117
Lancaster, Pa	21
Malden, Mass	46
Manchester, N. H	18
Mobile, Ala	10
New Britain, Conn	28
Passaic, N. J	8
Pawtucket, R. I	13
Portland, Me	5
Saginaw, Mich	18
Schenectady, N. Y	10
Somerville, Mass	48
Troy, N. Y	20
Utica, N. Y	36
Wilkes-Barre, Pa	6
Yonkers, N. Y	140
From 25,000 to 50,000 population:	
Battle Creek, Mich	34
Bay City, Mich	25
Brookline, Mass	21
Cedar Rapids, Iowa	5
Chelsea, Mass	8
Cranston, R. I	12
Cumberland, Md	5
Decatur, Ill	15
East Orange, N. J	56
Evanston, Ill	8
Everett, Mass	27
Fitchburg, Mass	9
Green Bay, Wis	8
Haverhill, Mass	12
Hazleton, Pa	7
Jackson, Mich	9
Kalamazoo, Mich	11
Kenosha, Wis	7
Kingston, N. Y	8
Lansing, Mich	25
Lynchburg, Va	20
McKeesport, Pa	12
Medford, Mass	20
Montclair, N. J	32
Mount Vernon, N. Y	54
Newport, R. I	13
New Rochelle, N. Y	125

From 25,000 to 50,000 population—Continued.	Cases.
Newton, Mass	20
Norristown, Pa	19
Orange, N. J	82
Perth Amboy, N. J	30
Pittsfield, Mass	67
Quincy, Mass	66
Roanoke, Va	5
Salem, Mass	8
Waltham, Mass	28
Waterloo, Iowa	5
West Hoboken, N. J	36
From 10,000 to 25,000 population:	
Adrian, Mich	6
Appleton, Wis	8
Ashbury Park, N. J	26
Beverly, Mass	24
Billings, Mont	30
Bloomfield, N. J	24
Burlington, Vt	6
Coffeyville, Kans	5
Dunkirk, N. Y	6
Eau Claire, Wis	5
Fulton, N. Y	31
Greenville, S. C	5
Greenwich, Conn	46
Hackensack, N. J	21
Harrison, N. J	36
Ithaca, N. Y	26
Johnstown, N. Y	10
Kearny, N. J	46
La Salle, Ill	6
Long Branch, N. J	25
Manitowoc, Wis	6
Middletown, N. Y	18
Morristown, N. J	6
North Adams, Mass	38
Northampton, Mass	22
Ossining, N. Y	23
Oswego, N. Y	59
Peekskill, N. Y	16
Plainfield, N. J	45
Plymouth, Pa	5
Pontiac, Mich	9
Salem, Oreg	7
Saratoga Springs, N. Y	9
Southbridge, Mass	5
Wausau, Wis	8
Webster, Mass	5
Westfield, Mass	14
West New York, N. J	47
West Orange, N. J	40
White Plains, N. Y	45
Winona, Minn	38
Woburn, Mass	6

Case rates.—The unusual prevalence of poliomyelitis in several of the States in the eastern section of the United States during the summer of 1916 produced case rates for this disease much higher than any of the rates for the year 1915. In 1915 the highest rates per 1,000 population were 0.116 in Vermont, 0.111 in Virginia, and 0.092

in Ohio, while the highest rates in 1916 were 1.376 in New Jersey, 1.287 in New York, and 0.764 in Connecticut. The lowest rates reported for 1915 were 0.001 in Oregon and in South Carolina and 0.002 in Texas, while the lowest rates for 1916 were 0.017 in Colorado, 0.020 in Washington, and 0.023 in Arizona.

Among the cities of over 100,000 population the highest rates reported for 1915 were in Cleveland, 0.218, in Lowell, 0.107, and in Fall River, 0.095, and for 1916 they were 3.478 in Newark, 1.610 in New York, and 1.497 in Trenton. The lowest case rates in 1915 were 0.003, 0.004, and 0.005 in Minneapolis, Denver, and Columbus, respectively, while they were 0.003, 0.007, and 0.009 in Kansas City, Spokane, and Nashville, respectively, for the year 1916.

Fatality rates.—The fatality rates per 100 cases reported were generally higher for the year 1915 than for 1916 as reported both for the States and the cities. This is due no doubt to the fact that the cases were not as completely reported in 1915 as in 1916. The highest rates for 1915 in the States were 78.57 in Wisconsin and 50 each in Arizona and Nevada, while for 1916 they were 42.86 in Wyoming, 31.53 in Maryland, and 29.27 in South Carolina. For 1915 the lowest rates in the States were 11.43 in Connecticut, 16.73 in New York, and 20.47 in Minnesota, while the lowest in 1916 were 10.53 in Oregon, 11.52 in Mississippi, and 11.55 in Minnesota.

The highest indicated case fatality rates in the larger cities for 1915 were 100 per cent each in Minneapolis, St. Paul, Bridgeport, Dayton, and Trenton, while for the year 1916 they were 100 per cent each in Youngstown and Tacoma and 82.61 in St. Louis. The lowest rates for 1915 were 6.67 per 100 cases in Los Angeles, 7.69 in Pittsburgh, and 10 in Boston, while the lowest for 1916 were 4.76 in New Bedford, 6.45 in San Francisco, and 6.67 in Louisville.

Poliomyelitis—Cases reported, and case and fatality rates, in States in which the prevalence of the disease is recorded, 1915 and 1916.

	Estimated population July 1, 1916.	1916				1915.			
		Total cases reported.	Deaths registered.	Case rate per 1,000.	Fatality, per cent.	Total cases reported.	Deaths registered.	Case rate per 1,000.[1]	Fatality, per cent.
Alabama	2,332,608	186	51	0.080	27.42	8	12	.....	.....
Arizona	255,544	6	(2)	.023	.....	2	1	0.008	50.00
California	2,938,654	132	26	.045	19.70	62	19	.022	30.65
Colorado	962,060	16	(2)	.017	.....	.....	.....	.....	.....
Connecticut	1,244,479	951	235	.764	24.71	34	4	.029	11.43
District of Columbia	363,980	39	6	.107	15.38	6	2	.017	33.33
Hawaii	.....	.....	.....	.....	.....	2	3	.....	.....
Indiana	2,816,817	207	50	.073	24.15	[3] 36	17	.013	47.22
Iowa	2,220,321	259	51	.117	19.69	.....	.....	.....	.....
Kansas	1,829,545	103	26	.056	25.24	48	15	.027	31.25
Louisiana	1,829,130	77	18	.042	23.38	9	(2)	.005	.....
Maine	772,489	149	(2)	.193	.....	.....	.....	.....	.....
Maryland	1,362,807	352	111	.258	31.53	66	(2)	.049	.....
Massachusetts	3,719,156	1,926	424	.518	22.01	.....	.....	.....	.....
Michigan	3,054,854	616	138	.202	22.40	71	30	.024	42.25
Minnesota	2,279,603	[3] 909	105	.399	11.55	[3] 127	26	.057	20.47
Mississippi	1,951,674	269	31	.138	11.52	85	(2)	.044	.....
Montana	459,494	94	26	.205	27.66	.....	.....	.....	.....
Nevada	.....	.....	.....	.....	.....	2	1	.019	50.00
New Jersey	2,948,017	4,055	1,180	1,376	29.10	36	(2)	.012	.....
New York	10,273,375	13,223	3,331	1.287	25.19	257	43	.026	16.73
Ohio	5,150,356	546	(2)	.106	.....	466	(2)	.092	.....
Oregon	835,741	38	4	.045	10.53	1	(2)	.001	.....
Pennsylvania	8,522,017	2,181	630	.256	28.89	.....	.....	.....	.....
South Carolina	1,625,475	123	36	.076	29.27	2	(2)	.001	.....
Texas	.....	.....	.....	.....	.....	8	(2)	.002	.....
Vermont	363,699	64	12	.176	18.75	42	17	.116	40.48
Virginia	2,192,019	330	59	.151	17.88	241	(2)	.111	.....
Washington	1,534,221	30	7	.020	23.33	10	3	.007	30.00
Wisconsin	2,500,350	475	79	.190	16.63	14	11	.006	78.57
Wyoming	179,559	7	3	.039	42.86	.....	.....	.....	.....

[1] The computations of case rates for 1915 were made on the basis of estimated population July 1, 1915.
[2] Deaths were not reported.
[3] The health officer states that cases are known not to be completely reported.

RABIES IN MAN.

Cases of rabies, all terminating in death, in man, as reported by States for the calendar year 1916, were: In Alabama, 3; in California, 1; Kansas, 1; Maryland, 2; Minnesota, 1; New Jersey, 1; Ohio, 4; Pennsylvania, 2; South Carolina, 3; Virginia, 2; and Washington, 1.

ROCKY MOUNTAIN SPOTTED FEVER.

The occurrence of Rocky Mountain spotted fever in the far Western and Northwestern States during the calendar year 1916, as reported by Surg. Fricks, after a detailed investigation and special endeavor to locate the cases, is given as follows: California, 11; Colorado, 5; Idaho, 151; Montana, 19; Nevada, 20; Oregon, 26; Utah, 29; Washington, 3; and Wyoming, 26.

The total of 290 cases located by Surg. Fricks shows a decided decrease as compared with 572 cases located during a similar investigation for the calendar year 1915.

Reports received currently during the season of 1917, up to July 10, give the cases as they were recorded in the States as follows: California, 1; Montana, 14; Nevada, 10; Oregon, 3; Washington, 3; Wyoming, 8.

SCARLET FEVER.

In the early months of 1917 scarlet fever was prevalent to an unusual extent in some of the cities of the Middle West. In Detroit, between January 6 and March 17, there were 1,740 reported cases, and in Chicago 3,248 cases were reported between February 3 and March 17.

Case rates.—The highest reported case rates per 1,000 population for the States were 2.057 in Michigan, 1.936 in Vermont, and 1.832 in Minnesota. The lowest rates were 0.019 in Hawaii, 0.102 in Arizona, and 0.152 in Louisiana.

The highest case rates per 1,000 population among the larger cities were 10.698 in Dayton, 7.748 in Omaha, and 3.962 in Toledo. The lowest were 0.269, 0.293, and 0.343 in New Orleans, Tacoma, and Louisville, respectively.

Fatality rates.—The highest number of deaths registered per 100 reported cases for the States were 18.52 in Wyoming, 6.05 in Iowa, and 3.41 in Montana; the lowest were 0.79 in Oregon, 0.87 in California, and 1.08 in Louisiana.

The highest fatality rates reported for the cities were 6.33 per 100 cases in Kansas City, 5.88 in Lowell, and 5.05 in Des Moines, and the lowest were 0.26 in Portland, 0.36 in Rochester, and 0.51 in Cincinnati.

Death rates.—The highest indicated death rates per 1,000 population, for scarlet fever, reported by States, were in Wyoming 0.111, in Michigan 0.055, and in Minnesota 0.050. The lowest indicated rates were in Louisiana 0.002, Alabama 0.006, and Oregon 0.006.

The highest death rates among the larger cities were 0.375 in Omaha, 0.235 in Kansas City, and 0.110 in Dayton. The lowest were 0.003 in New Orleans and in Portland, and 0.004 in Rochester.

Scarlet fever—Cases reported, and case and fatality rates, in States in which the prevalence of the disease is recorded, 1915 and 1916.

	Estimated population July 1, 1916.	1916					1915				
		Total cases reported.	Deaths registered.	Case rate per 1,000.	Fatality per cent.	Death rate per 1,000.[1]	Total cases reported.	Deaths registered.	Case rate per 1,000.[2]	Fatality per cent.	Death rate per 1,000.[1]
Alabama	2,332,608	848	15	0.364	1.77	0.006	705	40	0.306	5.67	.....
Arizona	255,544	26	[3]	.102	.....	.....	65	2	.263	3.08	.....
California	2,938,654	3,894	34	1.325	.87	.012	[4] 2,893	53	1.016	1.83	.....
Colorado	962,060	938	[3]	.975	.....	.....	.....	.....	.....	.....	.....
Connecticut	1,244,479	1,213	29	.975	2.39	.023	1,641	31	1.341	1.89	.....
District of Columbia	363,980	530	6	1.456	1.13	.016	794	8	2.214	1.01	.....
Hawaii	215,741	4	[3]	.019	.....	.....	13	2	.056	15.38	.....
Indiana	2,816,817	3,645	90	1.294	2.47	.032	[4] 4,065	93	1.453	2.29	.....
Iowa	2,220,321	1,602	97	.722	6.05	.044	.....	.....	.....	.....	.....
Kansas	1,829,545	2,265	57	1.238	2.52	.031	1,478	35	.818	2.37	.....
Louisiana	1,829,130	278	3	.152	1.08	.002	99	[3]	.055	.....	.....
Maine	772,489	316	[3]	.409	.....	.....	.....	.....	.....	.....	.....
Maryland	1,362,807	1,967	51	1.443	2.59	.037	2,411	[3]	1.783	.....	.....
Massachusetts	3,719,156	6,271	109	1.686	1.74	.029	.....	.....	.....	.....	.....
Michigan	3,054,854	6,283	167	2.057	2.66	.055	3,007	101	.997	3.36	.....
Minnesota	2,279,603	[4] 4,177	113	1.832	2.71	.050	[4] 3,962	138	1.763	3.48	.....
Mississippi	1,951,674	696	13	.357	1.87	.007	387	[3]	.201	.....	.....
Montana	459,494	352	12	.766	3.41	.026	.....	.....	.....	.....	.....
Nevada	.....	.....	.....	.....	.....	.....	262	5	2.550	1.91	.....
New Jersey	2,948,017	4,209	69	1.428	1.64	.023	4,667	97	1.619	2.08	.....
New York	10,273,375	11,083	176	1.079	1.59	.017	15,802	409	1.567	2.59	.....
Ohio	5,150,356	9,156	[3]	1.778	.....	.....	9,173	[3]	1.803	.....	.....
Oklahoma	.....	.....	.....	.....	.....	.....	2,312	49	1.094	2.12	.....
Oregon	835,741	629	5	.753	.79	.006	385	5	.476	1.30	.....
Pennsylvania	8,522,017	8,076	220	.948	2.72	.026	.....	.....	.....	.....	.....
Rhode Island	614,315	980	27	1.595	2.76	.044	.....	.....	.....	.....	.....
South Carolina	1,625,475	533	13	.328	2.44	.008	277	7	.172	2.53	.....
Texas	.....	.....	.....	.....	.....	.....	1,711	56	.394	3.27	.....
Utah	.....	.....	.....	.....	.....	.....	586	9	1.381	1.54	.....
Vermont	363,699	704	13	1.936	1.85	.036	313	3	.864	.96	.....
Virginia	2,192,019	1,467	27	.669	1.84	.012	2,116	[3]	.975	.....	.....
Washington	1,534,221	654	14	.426	2.17	.009	679	7	.462	1.03	.....
West Virginia	.....	.....	.....	.....	.....	.....	382	5	.281	1.31	.....
Wisconsin	2,500,350	3,983	110	1.593	2.76	.044	1,991	68	.805	3.42	.....
Wyoming	179,559	108	20	.601	18.52	.111	190	31	1.091	16.32	.....

[1] Not computed for 1915.
[2] The computations of case rates for 1915 were made on the basis of estimated population July 1, 1915.
[3] Deaths were not reported.
[4] The health officer states that cases are known not to be completely reported.

SMALLPOX (VIRULENT STRAIN).

Arizona.—An outbreak of smallpox of the virulent type occurred in Arizona at Douglas, where 46 cases with 10 deaths were reported between May 21 and June 25, 1917.

Massachusetts.—At Worcester, Mass., 38 cases of virulent smallpox were reported; at Fitchburg, 4 cases; at Shrewsbury, 3 cases; and at Webster, 3 cases, making a total of 48 cases, of which 9 terminated fatally. This outbreak occurred between January 16 and July 28, 1917.

Minnesota.—At Duluth there were 27 cases of virulent smallpox reported, with 7 deaths, from June 11 to 19. From this focus other minor outbreaks developed in the State.

Texas.—At Austin there were 123 cases of virulent smallpox, with 22 deaths, reported from January to April, 1917. At Waco there were 112 cases, with 27 deaths, between November 1, 1916, and January 29, 1917. In Hill County there were 25 cases in March, 1917.

SMALLPOX.

Smallpox of the mild type is still prevalent, but the reports received for the calendar year 1916 showed a considerable falling off in the numbers of cases reported by the States as compared with 1915. Alabama reported 775 cases for 1915 and only 157 cases for 1916. Indiana had 3,456 reported cases in 1915 and 1,158 in 1916. Kansas reported 2,861 in 1915 and 2,085 in 1916. Minnesota had 1,708 in 1915 and 1,270 in 1916. The Mississippi figures for 1915 were 2,461 and 1,401 for 1916. New York reported 155 in 1915 and 30 in 1916. Ohio reported 3,221 for 1915 and 1,921 for 1916. Oregon reported 579 and 119; South Carolina, 394 and 93; Vermont, 214 and 152; Virginia, 1,097 and 399; and Wisconsin, 1,817 and 867, for the years 1915 and 1916, respectively. A few of the States, however, reported more cases in 1916 than in 1915.

Smallpox—Cases reported, and case and fatality rates, in States in which the prevalence of the disease is recorded, 1915 and 1916.

	Estimated population July 1, 1916.	1916				1915			
		Total cases reported.	Deaths registered.	Case rate per 1,000.	Fatality per cent.	Total cases reported.	Deaths registered.	Case rate per 1,000.[1]	Fatality per cent.
Alabama	2,332,608	157	.....	0.067	.....	775	4	0.337	0.52
Arizona	255,544	49	[2]	.192	.....	91	4	.368	4.40
California	2,938,654	234	12	.080	5.13	336	3	.118	.89
Colorado	962,060	103	[2]	.107	.....	.....	.....	.....	.....
Connecticut	1,244,479	175	.....	.141	.....	22	.....	.018	.....
District of Columbia	363,980	4	.....	.011	.....	15	.....	.042	.....
Hawaii	215,741	1	.....	.005	.....	.....	.....	.....	.....
Indiana	2,816,817	1,158	.....	.411	.....	[3] 3,456	10	1.235	.29
Iowa	2,220,321	1,478	1	.666	.07	.....	.....	.....	.....
Kansas	1,829,545	2,085	3	1.140	.14	2,861	8	1.583	.28
Louisiana	1,829,130	919	2	.448	.24	350	.....	.194	.....
Maryland	1,362,807	69	.....	.051	.....	94	.....	.070	.....
Massachusetts	3,719,156	32	.....	.009	.....	.....	.....	.....	.....
Michigan	3,054,854	1,365	1	.447	.07	918	5	.304	.54
Minnesota	2,279,603	[3] 1,270	1	.557	.08	[3] 1,708	3	.760	.18
Mississippi	1,951,674	1,401	10	.718	.71	2,461	.....	1.277	.....
Montana	459,494	569	6	1.238	1.05	.....	.....	.....	.....
Nevada	.....	.....	.....	.....	.....	83	.....	.808	.....
New Jersey	2,948,017	9	.....	.003	.....	152	.....	.053	.....
New York	10,273,375	30	3	.003	10.00	155	.....	.015	.....
Ohio	5,150,356	1,921	[2]	.373	.....	3,221	.....	.633	.....
Oklahoma	.....	.....	.....	.....	.....	3,743	16	1.770	.43
Oregon	835,741	119	.....	.142	.....	579	4	.715	.69
Pennsylvania	8,522,017	97	.....	.011	.....	.....	.....	.....	.....
South Carolina	1,625,475	93	2	.057	2.15	394	2	.245	.51
Texas	.....	.....	.....	.....	.....	2,037	101	.469	4.96
Utah	.....	.....	.....	.....	.....	456	.....	1.075	.....
Vermont	363,699	152	1	.418	.66	214	1	.590	.47
Virginia	2,192,019	399	1	.182	.25	1,097	.....	.505	.....
Washington	1,534,221	637	1	.415	.16	254	2	.173	.79
West Virginia	.....	.....	.....	.....	.....	1,450	2	1.067	.14
Wisconsin	2,500,350	867	1	.347	.12	1,817	6	.735	.33
Wyoming	179,559	67	3	.373	4.48	59	3	.339	5.08

[1] The computations of case rates for 1915 were made on the basis of estimated population July 1, 1915.
[2] Deaths were not reported.
[3] The health officer states that cases are known not to be completely reported.

VACCINATION STATUS OF REPORTED CASES.[1]

A number of State departments of health endeavor to ascertain the vaccination histories of all persons contracting smallpox. The following table gives a summary of the vaccination status of such persons in these States for the calendar years 1914, 1915, and 1916 and the available information for the years 1912 and 1913:

State and year.	Cases reported.	Vaccination history of cases.					Remarks.
		Deaths.	Number vaccinated within seven years preceding attack.	Number last vaccinated more than seven years preceding attack.	Number never successfully vaccinated.	Vaccination history not obtained or uncertain.	
1916.							
California	240	.....	15	48	143	34	
Kansas	2,014	.....	10	49	967	988	
Maryland	69	.....	.....	2	67	.....	
Massachusetts	22	.....	2	2	18	.....	
Michigan	995	.....	20	37	891	47	
Minnesota	1,270	.....	23	63	1,152	32	
New York	1	.....	.....	.....	.....	1	
Ohio	1,924	.....	10	41	693	1,180	
Wisconsin	751	2	37	38	471	205	
Total	7,286	2	117	280	4,402	2,487	
1915.							
California	336	.....	11	25	256	44	
Kansas	2,855	.....	16	77	1,154	1,608	
Maryland	82	.....	.....	2	80	.....	
Massachusetts	22	9	1	4	3	14	
Michigan	859	.....	6	26	748	79	
Minnesota	1,646	2	28	92	1,328	198	
New York	118	.....	12	11	72	23	
Ohio	3,048	.....	20	65	1,518	1,445	
Wisconsin	1,826	8	145	190	821	670	
Total	10,792	19	239	492	5,980	4,081	
1914.							
California	638	.....	17	49	350	222	
District of Columbia	27	.....	4	3	20	.....	
Maryland (exclusive of Baltimore)	214	1	1	3	210	.....	
Massachusetts	24	2	6	4	12	2	
Michigan	1,244	1	7	41	998	198	
Minnesota	1,732	.....	22	105	1,186	419	
New York	730	.....	38	33	553	106	
Ohio	4,578	13	12	65	1,667	2,834	
Wisconsin	3,004	7	163	190	779	1,872	
Total	12,191	24	270	493	5,775	5,653	
1913.							
California	662	.....	24	36	419	183	10 months, March to December.
Maryland (exclusive of Baltimore)	103	.....	.....	6	97	.....	Except May and July.
Massachusetts	152	.....	23	16	76	37	Except July.
Michigan	1,478	.....	15	55	1,114	294	
Minnesota	2,861	.....	47	201	2,255	358	
New York	737	.....	22	94	432	189	Except June.
Ohio	1,782	.....	10	21	763	988	Except February, March, April, and May.

[1] The table was prepared from monthly reports as received currently from the States, and does not include all the cases of final record in the various States.

State and year.	Cases reported.	Vaccination history of cases.					Remarks.
		Deaths.	Number vaccinated within seven years preceding attack.	Number last vaccinated more than seven years preceding attack.	Number never successfully vaccinated.	Vaccination history not obtained or uncertain.	
Vermont	34	.....	.....	1	9	24	January only.
Wisconsin	2,054	.....	160	195	520	1,179	
1912.							
Massachusetts	37	.....	1	1	23	12	October, November, December.
Minnesota	1,066	.....	25	76	775	190	7 months, June to December.
Montana	20	.....	.....	.....	4	16	November only.
New York	372	.....	.....	29	204	139	October, November, December.

TUBERCULOSIS.

In several of the States all forms of tuberculosis are reportable, and in some of these pulmonary tuberculosis is also separately reportable. In a few of the States only the pulmonary form of the disease is reportable.

TUBERCULOSIS, PULMONARY.

Case rates.—The highest case rates per 1,000 inhabitants as reported by the States for 1916 were in Hawaii 3.963, Mississippi 3.599, and New York 2.908. The lowest rates were 0.629 in Montana and 0.705 in Washington.

For the larger cities the highest reported rates were 4.891, 4.415, and 4.202, in Newark, Albany, and New Orleans, respectively. The lowest reported case rates per 1,000 population were 0.488, 0.904, and 1.430, in Tacoma, Portland, and Youngstown, respectively.

Fatality rates.—Although the notification of cases of tuberculosis has continued to improve, the comparison of the reports received both for States and cities shows that the reporting of cases is so generally incomplete that any statement of case-fatality rates would only be misleading, except as emphasizing the fact that the cases are not all reported. This is true also as to the indicated case rates per 1,000 population for many of the States and cities.

Death rates.—Of the death rates from pulmonary tuberculosis per 1,000 population, the highest were 1.778, 1.768, and 1.599 in the District of Columbia, Maryland, and the Territory of Hawaii, respectively. The lowest indicated death rates were in Kansas, Iowa, and Oregon, with 0.459, 0.523, and 0.614, per 1,000 inhabitants, respectively.

The highest rates in the large cities were 2.859 in San Antonio, 2.585 in New Orleans, and 2.131 in Albany. The lowest rates were in Tacoma, Salt Lake City, and Spokane, with 0.275, 0.349, and 0.392, respectively.

Tuberculosis, pulmonary.—Cases reported, and case and fatality rates, in States in which the prevalence of the disease is recorded, 1915 [1] and 1916.

	Estimated population July 1, 1916.	1916					1915				
		Cases reported.	Deaths registered.	Case rate per 1,000.	Cases reported for each death.	Death rate per 1,000.[2]	Cases reported.	Deaths registered.	Case rate per 1,000.[3]	Cases reported for each death.	Death rate per 1,000.[2]
Alabama	2,332,608	2,809	2,526	1.204	1.11	1.083	1,341	2,341	.....	.....	.....
California	2,938,654	[4]	4,608	.....	.....	1.568	6,213	5,551	2.181	1.12	.....
Connecticut	1,244,479	2,016	1,517	1.620	1.33	1.219	2,015	1,471	1.647	1.37	.....
District of Columbia	363,980	[4]	647	.....	.....	1.778	1,095	734	3.053	1.49	.....
Hawaii	215,741	855	345	3.963	2.48	1.599	808	388	3.495	2.08	.....
Indiana	2,816,817	2,455	3,242	.....	.....	1.151	[5] 2,376	3,926	.....	.....	.....
Iowa	2,220,321	[6]	1,161	.....	.....	.523	.....	.....	.....	.....	.....
Kansas	1,829,545	[4]	839	.....	.....	.459	1,303	972	.721	1.34	.....
Louisiana	1,829,130	1,939	1,159	1.060	1.67	.634	142	[7]	.079	.....	.....
Maryland	1,362,807	3,287	2,410	2.412	1.36	1.768	3,215	[7]	2.378	.....	.....
Massachusetts	3,719,156	7,878	4,212	2.118	1.87	1.133	.....	.....	.....	.....	.....
Michigan	3,054,854	[4]	2,477	.....	.....	.811	3,848	2,822	1.276	1.36	.....
Minnesota	2,279,603	4,152	1,917	1.821	2.17	.841	[5] 4,622	2,231	2.057	2.07	.....
Mississippi	1,951,674	7,024	2,453	3.599	2.86	1.257	8,089	[7]	4.198	.....	.....
Montana	459,494	289	[7]	.629	.....	.....	.....	.....	.....	.....	.....
Nevada	.....	.....	.....	.....	.....	.....	168	49	1.635	3.43	.....
New York	10,273,375	29,872	14,000	2.908	2.13	1.363	32,743	16,309	3.246	2.01	.....
Oregon	835,741	425	513	.....	.....	.614	437	684	.....	.....	.....
Rhode Island	614,315	859	828	1.398	1.04	1.348	.....	.....	.....	.....	.....
South Carolina	1,625,475	[4]	1,606	.....	.....	.988	393	1,985	.....	.....	.....
Vermont	363,699	320	320	.880	1.00	.880	288	251	.795	1.15	.....
Virginia	2,192,019	[4]	3,337	.....	.....	1.522	5,005	[7]	2.305	.....	.....
Washington	1,534,221	1,082	952	.705	1.14	.621	[5] 1,749	1,238	1.189	1.41	.....
Wisconsin	2,500,350	[4]	2,029	.....	.....	.811	1,766	2,286	.....	.....	.....

[1] Reports for 1915 included other forms.
[2] Not computed for 1915.
[3] The computations of case rates for 1915 were made on the basis of estimated population July 1, 1915.
[4] Pulmonary tuberculosis is not separately reportable.
[5] The health officer states that cases are known not to be completely reported.
[6] Not a reportable disease in Iowa.
[7] Deaths were not reported.

TUBERCULOSIS, ALL FORMS.

Case rates.—Among those States in which all forms of tuberculosis are notifiable, the highest indicated case rates per 1,000 population were in the Territory of Hawaii, 4.436; and in the States of New Jersey and New York, with 3.059 and 2.873, respectively. The lowest indicated case rates were in Wyoming and Maine, with 0.312 and 0.593, respectively.

The large cities reporting the highest case rates were Newark, Los Angeles, and Chicago, with 5.916, 5.353, and 4.811, respectively, per 1,000 population. The lowest case rates of the cities were 0.917 in Portland, 1.076 in Scranton, and 1.495 in Youngstown.

Death rates.—The highest death rates per 1,000 population among the reporting States for all forms of tuberculosis were those in the Territory of Hawaii and State of California, with 1.896 and 1.792, respectively. The lowest reported death rates were in Wyoming and Kansas, with 0.312 and 0.530, respectively.

Of the death rates per 1,000 population among the cities of over 100,000, for all forms of tuberculosis, the highest were those in San Antonio, 3.141; in Albany, 2.409; and in Cincinnati, 2.256. The lowest rates were those in Tacoma, Spokane, and Salt Lake City, with 0.479, 0.526, and 0.554, respectively.

Cases reported per death registered.—A comparison of the numbers of cases reported for each death registered for 1916 with the same data for 1915 for all forms of tuberculosis is interesting as indicating the degree of completeness with which cases are being reported in some of the States.

For each death registered the numbers of cases reported by some of the States for the years 1915 and 1916 are as follows: California had 1.12 cases reported for each death registered in 1915 and 1.33 reported cases for each death registered in 1916; the District of Columbia had 1.49 reported cases in 1915 for each registered death, and in 1916, 1.46 cases for each death; Hawaii had 2.08 cases in 1915 and 2.34 in 1916 for each death registered. Kansas had cases reported for each death registered in 1915 and 1916, 1.34 and 1.41, respectively. Massachusetts had 1.36 and 2.41; Minnesota, 2.07 and 1.95; New Jersey, 1.97 and 2.08; and New York, 2.01 and 1.94 in 1915 and 1916, respectively.

Tuberculosis, all forms.—Cases reported, and case and fatality rates, in States in which the prevalence of the disease is recorded, 1915 and 1916.

	Estimated population July 1, 1916.	1916					1915				
		Cases reported.	Deaths registered.	Case rate per 1,000.	Cases reported for each death.	Death rate per 1,000.	Cases reported.	Deaths registered.	Case rate per 1,000.[1]	Cases reported for each death.	Death rate per 1,000.[2]
Alabama	2,332,608		2,722			1.166	1,341	2,341			
California	2,938,654	6,980	5,267	2.375	1.33	1.792	6,213	5,551	2.181	1.12	
Connecticut	1,244,479		223				2,015	1,471	1.647	1.37	
District of Columbia	363,980	1,061	729	2.915	1.46	2.003	1,095	734	3.053	1.49	
Hawaii	215,741	957	409	4.436	2.34	1896	808	388	3.495	2.08	
Indiana	2,816,817		3,792			1.346	[3] 2,376	3,926			
Iowa	2,220,321	[4]	1,403			.632					
Kansas	1,829,545	1,363	969	.745	1.41	.530	1,303	972	.721	1.34	
Louisiana	1,829,130		1,256			.687	142	[5]	.079		
Maine	772,489	458	[5]	.593							
Massachusetts	3,719,156	8,537	5,002	2.295	1.71	1.345					
Michigan	3,054,854	7,076	2,932	2.316	2.41	.960	3,848	2,822	1.276	1.36	
Minnesota	2,279,603	[3] 4,649	2,378	2.039	1.95	1.043	[3] 4,622	2,231	2.057	2.07	
Mississippi	1,951,674		2,625			1.345	8,089	[5]	4.198		
Montana	459,494		407			.886					
Nevada							168	49	1.635	3.43	
New Jersey	2,948,017	9,017	4,333	3.059	2.08	1.470	8,612	4,377	2.988	1.97	
New York	10,273,375	30,540	15,721	2.973	1.94	1.530	32,743	16,309	3.246	2.01	
Ohio	5,150,356	5,997	[5]	1.164			6,624	[5]	1.302		
Oklahoma							593	405	.280	1.46	
Oregon	835,741	447	646			773	437	684			
Pennsylvania	8,522,017	11,305	10,827	1.327	1.04	1.270					
Porto Rico							1,720	2,107			
Rhode Island	614,315	908	991			1.613					
South Carolina	1,625,475	251	1,732			1.066	393	1,985			
Texas							512	3,146			
Utah							131	155			
Vermont	363,699		384			1.056	288	251	.795	1.15	
Virginia	2,192,019	3,584	3,683			1.608	5,005	[5]	2.305		
Washington	1,534,221		1,228			.800	[3] 1,749	1,238	1.189	1.41	
West Virginia							332	65	.244	5.11	
Wisconsin	2,500,350	[3] 1,497	2,243			.897	1,766	2,286			
Wyoming	179,559	[3] 56	56	.312	1.00	.312					

[1] The computations of case rates for 1915 were made on the basis of estimated population July 1, 1915.
[2] Not computed for 1915.
[3] The health officer states that cases are known not to be completely reported.
[4] Not a reportable disease in Iowa.
[5] Deaths were not reported.

TYPHOID FEVER.

Milk outbreaks.—During the year, outbreaks of typhoid fever spread by milk were reported at Lynn, Naugatuck, and Whitman, Mass., at Colorado Springs, Colo., and St. Louis, Mo. An outbreak due to ice cream was reported at Harrisburg, Pa.

Infected oysters.—Outbreaks of typhoid fever due to infected oysters were reported at San Francisco, Berkeley, Alameda, Pasadena, Redlands, and San Diego, Cal.

Case rates.—The highest case rates per 1,000 population, for typhoid fever, among the States that reported for 1916, were in Mississippi and Maryland, with rates of 3.092 and 1.958, respectively. The lowest indicated case rates were in Arizona, Oregon, and Rhode Island, with rates of 0.200, 0.251, and 0.277, respectively.

The highest reported case rates among the cities of over 100,000 population were those of Birmingham 4.869, Indianapolis 3.095, and Nashville 2.469; and the lowest were those of Scranton 0.116; Spokane 0.180, and Paterson 0.181.

Fatality rates.—The highest fatality rates per 100 cases of typhoid fever as indicated by the numbers of cases and deaths reported by States were 49.43, 35.71, and 24.76, in South Carolina, Wyoming, and Oregon, respectively. These high rates are undoubtedly due to defective registration of cases and deaths. The lowest rates were those of Maryland, Massachusetts, and Mississippi, with indicated fatality rates of 10.01, 10.63, and 11.07, respectively.

The highest fatality rates per 100 cases reported for the large cities for the calendar year 1916 were 47.62, 47.06, and 42.22, in Houston, Scranton, and Syracuse, respectively, indicating probably defective registration of cases or deaths, or both. The lowest fatality rates were in Lynn, Trenton, and Fall River, with 5.19, 6.12, and 6.36, respectively, per 100 cases reported.

Death rates.—Of the death rates per 1,000 population, as indicated by the State reports received for the calendar year 1916, the highest were those of 0.342 in Mississippi, 0.298 in Alabama, and 0.292 in South Carolina. The lowest were 0.043 in Massachusetts, 0.051 in Washington, and 0.056 in Minnesota.

The highest death rates for typhoid fever as reported by cities having over 100,000 population were 0.446, 0.299, and 0.273, in Birmingham, Nashville, and Dallas, respectively. The lowest were those of Spokane, Tacoma, and Trenton, with 0.020, 0.027, and 0.027, respectively, as computed from the numbers of deaths reported for the calendar year 1916.

Typhoid fever—Cases reported, and case and fatality rates, in States in which the prevalence of the disease is recorded, 1915 and 1916.

	Estimated population July 1, 1916.	1916					1915				
		Cases reported.	Deaths registered.	Case rate per 1,000.	Fatality per cent.	Death rate per 1,000.	Cases reported.	Deaths registered.	Case rate per 1,000.[1]	Fatality per cent.	Death rate per 1,000.[2]
Alabama	2,332,608	3,591	694	1.540	19.33	0.298	2,019	674	0.877	[3]33.38	.....
Arizona	255,544	51	([4])	.200	.....	.....	[5]105	41	.425	[3]39.05	.....
California	2,938,654	1,205	209	.410	17.34	.071	1,126	276	.395	[3]24.51	.....
Colorado	962,060	542	([4])	.563	.....	.....	.....	.....	.....	.....	.....
Connecticut	1,244,479	538	93	.432	17.29	.075	981	146	.802	14.88	.....
District of Columbia	363,980	308	46	.846	12.50	.126	359	42	1.015	11.70	.....
Hawaii	215,741	212	44	.983	20.75	.204	117	29	.506	[3]24.79	.....
Indiana	2,816,817	3,296	600	1.170	18.20	.213	[5]1,718	413	.614	[3]24.04	.....
Iowa	2,220,321	.....	155	.....	.....	.070	.....	.....	.....	.....	.....
Kansas	1,829,545	2,104	263	1.150	12.50	.144	1,316	194	.728	14.74	.....
Louisiana	1,829,130	1,413	347	.772	24.56	.190	518	([4])	.288	.....	.....
Maine	772,489	426	([4])	.551	.....	.....	.....	.....	.....	.....	.....
Maryland	1,362,807	2,668	267	1.958	10.01	.196	3,198	([4])	2.365	.....	.....
Massachusetts	3,719,156	1,515	161	.407	10.63	.043	.....	.....	.....	.....	.....
Michigan	3,054,854	2,225	405	.728	18.20	.133	1,730	331	.574	[3]19.13	.....
Minnesota	2,279,603	[5]916	127	.402	13.86	.056	[5]1,010	148	.450	14.65	.....
Mississippi	1,951,674	6,035	668	3.092	11.07	.342	6,158	([4])	3.196	.....	.....
Montana	459,494	407	47	.886	11.55	.102	.....	.....	.....	.....	.....
Nevada	.....	.....	.....	.....	.....	.....	129	17	1.256	13.18	.....
New Jersey	2,948,017	1,390	194	.472	13.96	.066	1,453	188	.504	12.94	.....
New York	10,273,375	4,417	593	.430	13.43	.058	5,484	750	.544	13.68	.....
Ohio	5,150,356	4,273	([4])	.830	.....	.....	4,501	([4])	.885	.....	.....
Oklahoma	.....	.....	.....	.....	.....	.....	1,381	189	.653	13.69	.....
Oregon	835,741	210	52	.251	24.76	.062	189	55	.233	[3]29.10	.....
Pennsylvania	8,522,017	8,697	1,155	1.021	13.28	.136	.....	.....	.....	.....	.....
Porto Rico	.....	.....	.....	.....	.....	.....	448	109	.378	[3]24.33	.....
Rhode Island	614,315	170	37	.277	21.77	.060	.....	.....	.....	.....	.....
South Carolina	1,625,475	961	475	.591	49.43	.292	1,144	522	.712	[3]45.63	.....
Texas	.....	.....	.....	.....	.....	.....	1,038	628	.239	[3]60.50	.....
Utah	.....	.....	.....	.....	.....	.....	373	39	.879	10.46	.....
Vermont	363,699	165	24	.454	14.55	.066	329	43	.908	13.07	.....
Virginia	2,192,019	4,218	546	1.924	12.94	.249	4,419	([4])	2.035	.....	.....
Washington	1,534,221	615	78	.401	12.68	.051	818	121	.556	14.79	.....
West Virginia	.....	.....	.....	.....	.....	.....	504	23	.371	4.56	.....
Wisconsin	2,500,350	999	173	.400	17.32	.069	400	98	.162	[3]24.50	.....
Wyoming	179,559	[5]56	20	.312	35.71	.111	57	8	.327	14.04	.....

[1] The computations of case rates for 1915 were made on the basis of estimated population July 1, 1915.
[2] Not computed for 1915.
[3] A fatality rate as high as this indicates that the cases have not been completely reported.
[4] Deaths were not reported.
[5] The health officer states that cases are known not to be completely reported.

TYPHUS FEVER.

During the year ended June 30, 1917, cases of typhus fever were reported from Arizona, California, Colorado, Illinois, Indiana, Iowa, Kansas, New Jersey, New York, Texas, and Utah. The localities principally affected were those situated along the Mexican border of the United States, where 82 cases of the disease were recorded during the year.

Reports received currently have given the localities of known cases as compiled in the following table:

Compilation of currently reported cases.

Place.	Number of cases reported.	Place.	Number of cases reported.
Arizona:		Indiana:	
Bisbee	3	Evansville	1
Florence	3	Iowa:	
Seligman	2	Fort Madison	5
Stark	1	Kansas:	
Total	9	Topeka	2
California:		New Jersey:	
Bakersfield	1	Jersey City	1
Clovis	1	New York:	
Corona	3	New York City	22
Kerman	1	Texas:	
Los Angeles	7	Austin	1
Los Banos	1	Brownsville	1
San Jose	1	Eagle Pass	2
Saugus	1	El Paso	57
Sherman	1	Galveston	1
Traver	1	Laredo	14
Total	118	Medina County	1
Colorado:		S. N. J. ranch	1
La Junta	8	Total	78
Trinidad	2	Utah:	
Total	10	Ogden	1
Illinois:			
Princeville	1		
Surrey	1		
Total	2		

A special report for the State of California gives 31 as the total number of cases from June 1, 1916, to February 1, 1917.

YELLOW FEVER.

On August 9, 1916, two cases of yellow fever were removed from a vessel at the United States quarantine at Quarantine, La.

World Prevalence of Cholera, Plague, Typhus Fever, and Yellow Fever.

The following statement of the world prevalence of disease is of value mainly in showing the geographic distribution of the diseases, their area of prevalence, and dates of occurrence. Owing to conditions which affect the transmission of information the data for the past year are necessarily incomplete as regards some portions of the world. This is especially true of the countries of central Europe, the countries which are the theater of war in the Orient, and, on our own hemisphere, of Mexico.

CHOLERA.

EUROPE.

In Europe, cholera was reported present in Austria-Hungary, Germany, Greece, and Turkey. The information was, however, fragmentary and incomplete and the actual prevalence of the disease is not known.

ASIA.

In Asia, cholera was reported present in China, Chosen (Korea), India, Indo-China, Japan, Java, Persia, Philippine Islands, Siam, Straits Settlements, and the Asiatic Provinces of Turkey.

China.—In China, cholera was reported during August and September, 1916, at Canton, with 15 cases; Hongkong with 9 cases, and Shanghai with 2 cases. In August, 1916, an epidemic outbreak was reported at Changteh, Province of Hunan.

Chosen.—In the island of Chosen (Korea), cholera was reported present at Chemulpo and Fusan in September, 1916. From August to October, 1916, 893 cases were reported as occurring in the central and southern portions of the island, and from August to December, 1916, the total reported occurrence was 1,998 cases.

India.—In India cholera was reported present at Bombay from July to November, 1916, with 172 cases, and in January and February, 1917, with 7 cases. At Calcutta 270 fatal cases were reported from July to December, 1916, and from the beginning of the year 1917 to May 5, 307 cases. At Karachi from August to October, 1916, 313 cases were reported. At Madras from July to December, 1916, and from January to April, 1917, the disease was present with an inconsiderable number of cases. In the Province of Burma cholera was present at Bassein during the last six months of the year 1916 and during the period from January to April, 1917, with 58 cases; at Rangoon from July to December, 1916, with an inconsiderable number of cases and from January to May, 1917, with 43 cases. In other localities of the Province fatalities from the disease were reported from July to December, 1916, and from January to April, 1917.

Indo-China.—In Indo-China from July 1 to December 31, 1917, 2,909 cases of cholera with 2,390 deaths were reported. The cases were distributed according to Provinces as follows: Anam, 700 cases with 544 deaths; Cambodia, 164 cases with 116 deaths; Cochin-China, 123 cases with 111 deaths; Kwang-Chow-Wan, 271 cases with 264 deaths; Laos, 652 cases with 630 deaths; and Tonkin, 999 cases with 725 deaths. In January, 1917, 52 cases were reported, and from February 1 to March 31, 1917, 61 cases, the Provinces affected being Anam, Cambodia, Cochin-China, Laos, and Tonkin. In the city of Saigon, from April 23 to May 27, 1917, 163 cases with 108 deaths were notified.

Japan.—Cholera was reported in Japan at Kobe, Nagasaki, Osaka, Tokyo, Yokohama, and on the island of Taiwan (Formosa). At Kobe 433 cases were notified from August 14 to November 5, 1916; at Nagasaki from August 8 to December 3, 1916, 339 cases were notified, and the disease was again reported present in February,

1917. At Osaka a total of 948 cases with 544 deaths was reported from August 13 to November 15, 1916. At Tokyo the disease was reported present in January and February, 1917. At Yokohama there were reported August 15, 1916, 6 cases, and at the quarantine station at Yokohama on the same date 55 cases occurring among persons from the steamship *Hawaii Maru*, from Hongkong via ports. On the island of Taiwan (Formosa) 15 cases occurred from September to December, 1916, the localities affected being Keelung and Taihoku. At Keelung the disease was again present in February, 1917.

Java.—Cholera was reported present on the island of Java as follows: East Java, July 1 to October 17, 1916, 33 cases; Mid-Java, July 1 to August 25, 1916, 92 cases; West Java, July 7 to December 14, 1916, 780 cases with 513 deaths, of which 82 cases with 45 deaths occurred in Batavia. From January 26 to April 26, 1917, 9 cases of cholera were reported in West Java, 6 of these cases occurring in Batavia.

Persia.—Cholera was present at Kazvin during July, August, and September, 1916, with 107 reported cases; at Recht with 20 cases in October; at Tabriz, in August, 1916, with 12 cases; and at Urumiah, in July, with 28 cases. In Mazanderan Province cholera was reported epidemic at Amol and Ferikenar in November, 1916, and in January, 1917, an outbreak occurred with an inconsiderable number of cases reported at 4 localities, the disease continuing present in February, 1917. At the city of Teheran 428 cases with 409 deaths were reported from August to November, 1916, with 64 additional cases occurring during the same period in localities in the vicinity of the city.

Philippine Islands.—During the third quarter of 1916, 781 cases of cholera with 351 deaths were notified at Manila, and 5,320 cases with 3,426 deaths were reported as occurring in 22 Provinces. During the fourth quarter of the year 1916, 324 cases with 109 deaths were notified at Manila, 5,283 cases with 3,339 deaths being reported from 27 Provinces. From the beginning of the year 1917 to May 12, 3,512 cases were reported from 27 Provinces and at Manila to April 28, 21 cases with 8 deaths.

Siam.—At Bangkok cholera was reported present in August, 1916, and from April 22 to May 12, 1917, 8 fatal cases were reported.

Straits Settlements.—Cholera was reported at Penang in March, 1917. At Singapore the disease was present in August, 1916, and from January to March, 1917.

Turkey in Asia.—From July to December, 1916, 9,565 cases of cholera with 4,909 deaths were reported in the Asiatic Provinces of Turkey. Among the important cities affected were Aleppo, with 33 cases; Bagdad, with 50 cases; Beirut, with 53 cases; Damascus, with 77 cases; Jaffa, with 151; a few cases at Smyrna; and at Trebizond 64 cases.

ON VESSELS.

Hawaii Maru.—Cholera occurred in August, 1916, on the steamship *Hawaii Maru* en route for Yokohama from Hongkong via ports. At Yokohama quarantine station 55 cases were detained.

Taihei Maru.—At Dairen, China, during the first week in August, 1916, a case of cholera was reported occurring on the steamship *Taihei Maru* from Hongkong and Chefoo.

PLAGUE.

EUROPE.

In Europe plague was present in Great Britain and Greece.

Great Britain.—During the period from July 30 to August 10, 1916, 3 cases of plague occurred at Bristol, England, in persons connected with a rag factory in that city. At Hull, England, a case occurred August 19, 1916, in a boy who had been at work on the steamship *Keneh*, which had been lying at Hull for repairs. At Liverpool 3 cases were reported September 22, 1916. The cases occurred in residents of the stable warehouse district, 1 mile distant from the water front, and were all in persons of the same family. On September 29, 1916, 2 additional cases were reported at Liverpool, making a total of 5 cases with 3 deaths reported to October 6, 1916.

Greece.—Plague was reported present, September 29, 1916, at Mitylene, Island of Chios, Ægean Sea. In December, 1916, a case was reported at Piræus. At Volo, a seaport in the Province of Larissa, a slight epidemic was reported September 29. The epidemic was declared extinct November 1, 1916.

ASIA.

In Asia plague was present in Arabia, the island of Ceylon, China, India, Indo-China, Japan, the island of Java, Siam, and the Straits Settlements.

Arabia.—In April, 1916, an outbreak of plague occurred at Aden, Arabia, with 14 cases occurring from April 8 to 14, 30 cases from April 15 to May 2, and 24 cases from April 16 to May 14, making a total from the date of the outbreak of 68 cases.

Ceylon.—From July 29 to December 30, 1916, 59 cases of plague were reported at Colombo, Island of Ceylon, and from December 31, 1916, to May 19, 1917, 178 cases.

China.—Plague was reported present in the vicinity of Amoy from July to December, 1916. From February 18 to May 5, 1917, the disease was reported present in Amoy and vicinity. At Canton 3 fatal cases were reported in August, 1916. At Chaochowfu, in the vicinity of Swatow, plague was reported present in February, 1917. A case of plague was notified at Hongkong in December, 1916, and from January 21 to May 26, 1917, 32 cases were notified. In Kansu Province 20 fatal cases of pneumonic plague were reported in October, 1916, at Taochow, and the disease was stated to be present at other localities in the province. In Kwangtung Province plague was reported present in Ta-pu district in June, 1917. At Nanking plague was reported present in March, 1917.

India.—The greatest reported prevalence of plague in Asia continued to be in India. From July 2 to December 23, 1916, a total of 122,186 cases with 95,980 deaths was reported for all India, and from December 31, 1916, to May 26, 1917, a total of 118,907 cases with

93,137 deaths. In Madras Presidency 9,638 cases were reported from July 9 to December 30, 1916, and from December 31, 1916, to May 26, 1917, 7,459 cases with 5,110 deaths. As regards cities, Bombay showed 277 cases with 198 deaths from July 2 to December 30, 1916, and from December 31, 1916, to May 26, 1,136 cases with 900 deaths; Calcutta, from March 4 to May 19, 1917, had an occurrence of 45 fatal cases; Karachi, from July 2 to December 30, 1916, 16 cases, and from December 31, 1916, to May 26, 1917, 865 cases with 840 deaths; Madras City, from September 24 to December 30, 1916, had 11 cases, and from December 31, 1916, to March 17, 1917, 81 cases with 51 deaths. In Burma, 383 cases, of which 353 were fatal, were reported at Rangoon from July 2 to December 30, 1916, and from December 31 to May 19, 1917, 565 cases with 531 deaths, and at other Burmese cities the disease was reported present, the greatest occurrence being at Prome with 274 fatal cases reported from July 2 to December 30, 1916, and from December 31, 1916, to March 17, 1917, 108 fatalities.

Indo-China.—From July 1 to December 31, 1916, 230 cases of plague with 142 deaths were reported in Indo-China; and from January 1 to February 28, 1917, 183 cases with 137 deaths. The cases were distributed in the Provinces of Anam, Cambodia, Cochin China, Kwang-Chow-wan, and Tonkin. In the city of Siagon 26 cases with 10 deaths were notified from July to December, 1917, and from January 1 to April 21, 1917, 60 cases with 35 deaths.

Japan.—Plague was reported in Japan in December, 1916, at Nagoya, with 2 cases, and at Yokkaichi, from October 20 to December 16, 1916, with 67 cases. On the island of Taiwan (Formosa) plague was reported at Tamsui from July to September, 1916, with 3 cases, and from February 15 to April 4, 1917, with 5 cases; at Shirin 1 case was notified in February, 1916.

Java.—The prevalence of plague in Java continued to be limited to the eastern portion of the island. From July 1 to September 1, 1916, 74 cases with 71 deaths were notified, and from January 1 to April 22, 1917, 140 cases with 135 deaths. The Provinces affected were Kediri, Madura, Madioen, Pasoeroean, Samarang, Surabaya, and Surakarta.

Mauritius.—Plague was present in December, 1916, in the island of Mauritius. To February 3, 1917, 20 cases with 11 deaths were reported. The prevalence was confined to the district of Port Louis.

Siam.—At Bangkok, Siam, from July to October, 1916, 49 cases of plague were reported, and from January 14 to May 26, 1917, 52 cases.

Straits Settlements.—At Singapore from July 2 to December 30, 1916, 12 cases of plague were notified, and from December 31, 1916, to April 28, 1917, 26 cases.

AFRICA.

In Africa plague was present in British East Africa, Egypt, the Gold Coast, and the Union of South Africa.

British East Africa.—In October, 1916, 4 cases of plague were reported at Nairobi, and at Kampala, in Uganda, 3 cases.

Egypt.—During the year 1916, 1,702 cases of plague with 828 deaths were reported, and from January 1 to May 17, 1917, 231 cases with 116 deaths. The cities affected were Alexandria, with 24 cases

occurring from July 6 to December 25, 1916, and from February 1 to March 28, 1917, 3 cases; Cairo, with 2 cases occurring in July and November, 1916; Port Said, with 5 cases occurring between July 20 and August 3, 1916, and from January 18 to April 22, 1917, 14 cases; and Suez, with 4 cases occurring in May, 1917. The Provinces affected were Beni-Souef, Fayoum, Galioubeh, Girgeh, Keneh, Menoufieh, Minieh, and Siout. The pneumonic form of plague occurred in 17 cases reported in the Province of Keneh from March 28 to April 5, 1917.

Gold Coast.—Plague was reported present at Akkra April 4, 1917.

Union of South Africa.—In the State of Cape of Good Hope an outbreak of plague occurred in the Uitenhage district in October, 1916, with 24 cases notified from October 23 to November 12, 1916. On June 16, 1917, a case of plague was notified at Queenstown. In the Transvaal an outbreak of the disease occurred in December, 1916. The area infected comprised two adjoining farms in the Potschefstroom district. In the Orange Free State a case of plague was reported at Odendaalsrust during the second week in April, 1917, and in the Winburg district from February 5 to March 18, 1917, 16 cases, occurring on five farms, were reported.

SOUTH AMERICA.

In South America plague was reported present in Brazil, Chili, Ecuador, and Peru.

Brazil.—Plague was reported present at Bahia from October 15 to December 16, 1916, with 17 cases, and from January 7 to May 5, 1917, with 14 cases. At Joazeiro, an interior town situated 250 miles from the city of Bahia, with which it is connected by rail, 67 cases were reported from June 1 to November 6, 1916. In the State of Pernambuco plague was present in September, 1916, at Garanhuns, an inland town having railway communication with the city of Pernambuco, distant 150 miles. From January 1 to April 27, 1917, 43 cases were reported in the State, occurring in the districts of Bom Conselho, Canhotinho, and Corrientes Garanhuns.

Chile.—Plague was present at Antofagasta in July, 1916, and again in March, 1917. At Tacna a case of plague was notified in March, 1917. At Tacopilla a fatal case was reported in September, 1916.

Ecuador.—At Guayaquil in July and August, 1916, 25 cases were reported; from September 1 to December 31, 1916, 347 cases, with 116 deaths; and in January, 1917, 104 cases, with 43 deaths. In Santa Rosa, a country district, in the vicinity of Manta, where plague was present in May, 1916, 1 case occurred in August and 1 case in September, 1916. At Milagro during the months of November and December, 1916, 4 cases were reported, and at Nobol 1 case occurred in October of that year. At Naranjal 1 case was reported in January, 1917, and at Taura 1 case.

Peru.—From July 1 to December 31, 1916, 150 cases of plague were reported in Peru, and from January 1 to May 31, 1917, 250 cases. The cases were distributed in the Departments of Ancachs, Arequipa, Cajamarca, Lambayeque, Libertad, Lima (including the Province of Callao), and Piura. The cases reported from the Department of Lima included 32 occurring in the city of Lima and the neighboring country, and 16 cases occurring at the port of Callao.

INSULAR.

Azores.—In November, 1916, plague was reported present on the island of Terceira, Azores.

Hawaii.—On March 7, 1917, a fatal case of plague was notified at Paauilo, Hawaii.

ON VESSELS.

Steamship Prothon.—On November 16, 1916, the steamship *Prothon*, employed in military service, arrived at Alexandria, Egypt, from Sidi Barani and Sollum, with a case of plague on board.

Steamship Santa Rita.—A case of plague was reported October 22, 1916, at Callao, Peru, occurring on the steamship *Santa Rita* from Caldera, Chile.

Steamship Sardinia.—The steamship *Sardinia* from Australian and oriental ports arrived at the port of London, England, May 2, 1917, with two cases of plague on board and a history of three other cases occurring en route between April 27 and May 2, 1917. During the period from May 3 to 8, 1917, two additional cases occurred among members of the crew of the *Sardinia.*

Steamship Sigmaringen.—A fatal case of plague occurred in November, 1916, on the steamship *Sigmaringen* en route from Karachi, India, for an Italian port. The *Sigmaringen* left Karachi October 9 and arrived in Catania, Italy, November 6, 1917.

RAT EXAMINATION AND PLAGUE IN RODENTS.

Rat destruction and examination were carried out during the period under report, but detailed reports of the actual number of rats examined are available only for the ports of Hongkong and Shanghai in China; Bristol, Hull, Liverpool, and London, in Great Britain; and Hawaii, the Philippine Islands, and Porto Rico in the insular possessions of the United States.

China.—At Hongkong from July 1 to December 31, 1916, 62,837 rats were examined, with 44 rats found plague infected, and from January 1 to June 16, 1917, 48,048 rats were examined, with 21 rats found infected. At Shanghai from November 25 to December 30, 1916, 1,882 rats were examined and from January 6 to June 30, 1917, 7,622 rats. No plague infection in rodents has been reported at Shanghai since May 6, 1916.

Great Britain.—At Bristol from August 1 to December 31, 1916, 1,675 rats were examined, with 1 plague-infected rat found during the month of August. At Hull from October 21 to December 30, 1916, 299 rats were examined; and from January 6 to May 18, 1917, 435 rats, with 2 plague-infected rats found March 17, 1917. These rats were found dead in the hold of the steamship *Venetia* from Bombay. At Liverpool from July 2 to December 30, 1916, 4,897 rats were examined and from December 31, 1916, to July 14, 1917, 4,972 rats. Four plague-infected rats were found at Liverpool from September 26 to October 21, 1916, and on March 17, 1917, a plague-infected rat was found. At London from October 5 to November 6, 1916, 601 rats were examined, of which 4 were found to be plague infected.

Hawaii.—In the Territory of Hawaii the work of rat examination continued to be carried on, with an average of about 400 rats ex-

amined weekly at Honolulu and about 1,500 at Hilo. A plague-infected rat was found on the property of the Hamakua Mill Co., November 7, and 1 on November 9, 1916. On November 8, 1916, a plague rat was found at Paauilo. At Paauhau 2 plague-infected rats were found on June 13 and 14, 1917, and on July 15, 1 rat.

Philippine Islands.—During the third quarter of the year 1916, 13,116 rats were examined, with 1 rat found positive for plague, the disease being of the chronic nonvirulent type. During the fourth quarter of 1916, 4,219 rats were examined.

Porto Rico.—During the period from July 8 to December 29, 1916, 1,711 rats and 236 mice were examined, and from December 30 to June 29, 1917, 987 rats and 68 mice.

In China plague in rodents was reported present in February, 1917, at Amoy and at Hing Ning.

In Cuba, from July 1 to September 28, 1916, 5,640 rats were examined.

In Zanzibar 3,900 rats were examined in July, 1916.

TYPHUS FEVER.

EUROPE.

Typhus-fever infection is present to a moderate degree throughout Europe. Cases occur, however, much more frequently in some localities than in others.

Reports of its prevalence during the past year are probably incomplete.

Austria-Hungary.—In Austria, from July 23 to October 22, 1916, 1,685 cases of typhus were reported, including 513 cases occurring in the Province of Galicia. From October 23 to December 17, 1916, 2,371 cases were reported, distributed as follows: Bohemia, 634 cases; Galicia, 809; Lower Austria, 47; Moravia, 617; Silesia, 16; Styria, 243; Upper Austria, 5. In the city of Prague from January 28 to March 10, 1917, 5 cases were notified; in Vienna, from July 2 to December 30, 1916, 35 cases, and from December 31, 1916, to March 24, 1917, 38 cases.

In Bosnia-Herzegovina from July 1 to October 22, 1916, 36 cases were reported; in Hungary, from November 20 to December 17, 1916, 36 cases; and from February 19 to March 25, 1917, 1,381 cases. In the city of Budapest from July 2 to October 28, 1916, 11 cases were reported, and from January 14 to March 31, 1917, 94 cases.

Belgium.—A case of typhus fever was notified at Ghent in October, 1916, and at Liege 1 case was reported in August and 1 case in October, 1916, and in January, 1917, 1 case.

Germany.—Typhus fever was reported mainly in cities with a few cases noted as occurring in prison camps. From July to December, 1916, 53 cases with 47 deaths were notified in cities. At Berlin 26 cases were notified, at Bremen 16 cases, at Breslau 4 cases, at Frankfort-on-the-Main 2 cases, at Hanover 7, at Königsberg 32, and at Stettin 3 cases. In 1917, 32 cases were reported as occurring in eight cities to March 10. From March 18 to April 28, 1917, 40 cases of typhus fever were reported in Germany, of which 13 occurred among the civil population, mainly in the district of Oppeln, and 27 in prison camps.

Great Britain.—In Great Britain 31 cases of typhus fever were reported from July to December, 1916. Of these, 1 case ocurred in England at Liverpool in October, in Ireland 12 cases at Belfast in July and September and 3 at Dublin in October; in Scotland, 1 case at Dundee in October and at Glasgow 14 cases occurring from July to December. From March 11 to May 12, 1917, 37 cases were reported at Belfast, and at Cork and Glasgow 1 case each was notified in January.

Greece.—In Greece typhus was reported in Athens with 2 fatal cases occurring in July and August, and at Saloniki with 242 cases. occurring from July 3 to December 25, 1916. From December 26, 1916, to May 19, 1917, 59 fatal cases were notified at Saloniki.

Italy.—In Bari Province, Italy, typhus fever was reported present at Andria in July, 1916, and at Corato in March, 1917, with 5 cases. At Palermo 1 case was notified in July, 1916.

Netherlands.—At Amsterdam 2 cases of typhus fever were reported from February 25 to March 3, 1917. At Rotterdam, from July 30 to December 30, 1916, 9 cases were reported; in February ,1917, there was 1 case.

Norway.—During the week ended August 5, 1916, a case of typhus was notified at Bergen.

Russia.—At Archangel typhus fever was present in November and December, 1916, with 29 reported cases; at Moscow, from July to December, 1916, with 548 cases; at Petrograd, July to December, 1916, with 206 cases. In Poland 1,533 cases, occurring in invaded regions, were reported from October 1 to December 2, 1916, 611 of these cases occurring at Warsaw. Typhus was again reported at Archangel from January to April, 1917, with 78 cases; at Moscow in January and February, 1917, with 141 cases; at Petrograd from December 31, 1916, to May 18, 1917, with 270 cases. At Riga 1 case was notified in April, 1917. From January 22 to March 21, 1917, 28 cases were notified at Vladivostok, in Asiatic Russia.

Spain.—Five fatal cases of typhus were reported at Madrid from August 1 to December 31, 1916, and for the year 1916, 35 fatal cases. From January 1 to May 31, 1917, 7 fatal cases were reported.

Sweden.—At Stockholm, 11 cases of typhus were reported from July 9 to December 4, 1916. During the week ended January 6, 1917, 3 cases were reported.

Switzerland.—In July and August, 1916, 8 cases were notified at Basel. At St. Gall, 1 case was reported in October, 1916, and at Zurich from July to December, 1916, 6 cases were reported. In February, 1917, 1 case was reported at Basel; and at Zurich, from July 1 to March 17, 1917, 4 cases were reported.

ASIA.

In Asia, typhus was reported present in China, Japan, the island of Java, Straits Settlements, and Asiatic Turkey. It undoubtedly had a much wider distribution.

China.—At Antung from July 22 to December 10, 1916, 12 cases were reported, and in January, 1917, 2 cases. At Hankow 1 case was reported in November, 1916, and at Harbin in July, 1916. At Tientsin the disease was present in October and November, 1916. At Tsingtao from December 28 to April 22, 1917, 10 cases were reported.

Japan.—In July, 1916, 2 cases of typhus were reported at Hakodate, and the disease was present at Tokyo. In July and August, 1916, 5 cases occurred among children at the summer resort of Karuizawa.

Java.—Typhus was reported in the three geographical divisions of the island of Java as follows: East Java, July 22 to December 16, 1916, 14 cases; January 8 to April 15, 1917, 22 cases. Mid-Java, July 1 to December 29, 1916, 163 cases; January 7 to April 30, 1917, 77 cases. West Java, July 7 to December 28, 1916, 293 cases; January 19 to May 10, 1917, 133 cases. In West Java, at the city of Batavia, from July 7 to December 28, 1916, 215 cases were reported, and from January 19 to May 10, 1917, 103 cases.

Straits Settlements.—At Penang, Straits Settlements, a case of typhus was reported March 5, 1917.

Turkey in Asia.—Typhus was reported in Asiatic Turkey at Adana, Haifa, Mersina, Tarsus, and Trebizond. At Adana the disease was reported present in April, 1917; at Haifa from July to October, 1916, 94 cases were reported; at Mersina, in April, 1917, 2 cases; at Tarsus, the disease was present in July, 1916, and again in April, 1917; at Trebizond, 3 cases were reported in August and September, 1916, and from December 31, 1916, to February 24, 1917, 7 cases. On February 7, 1917, 54 cases were reported in the Army of the Orient.

AFRICA.

In Africa typhus fever was reported present in Algeria, Egypt, and Tunisia.

Algeria.—From February 1 to April 2, 1917, 7 cases of typhus fever were reported.

Egypt.—Typhus was reported present at Alexandria, Cairo, and Port Said, Egypt. At Alexandria, from July to December, 1916, 220 cases were reported; and from January to April, 1917, 1,574 cases. At Cairo, July to December, 1916, 330 cases were reported; at Port Said during the same period there were 16 cases.

Tunisia.—At Tunis in December, 1916, there was reported 1 case.

CENTRAL AMERICA.

The only prevalence of typhus fever in Central America was reported in Mexico. The data were incomplete. Infection was reported in various localities as follows:

Aguascalientes.—July to October, 1916, 181 fatal cases reported. On December 22, 1916, the disease was reported epidemic.

Chihuahua.—On September 7, 1916, 40 cases were reported. On September 20, the number of cases present was estimated at 100. On October 31, 1916, the disease was declared epidemic.

Ciudad Juarez.—One hundred cases were estimated as having occurred from July, 1916, to February 5, 1917.

Durango.—Typhus was reported present in September and December, 1916, and in January and February, 1917, present with an estimated number of 25 fatalities occurring daily. The disease was stated to have been present throughout the year 1916.

Federal District.—In October, 1916, 334 cases of typhus were reported. At Mexico City from August 28 to December 2, 1916, 3,300 cases were stated to have occurred, and from June 3 to 16, 1917, 193 cases were reported.

Guanajuato.—In December, 1916, 80 cases were reported.

Leon.—In October, 1916, there were reported 25 cases of typhus.

Monterey.—One case was reported in April, 1917.

Nuevo Laredo.—During the period from July 1 to December 16, 1916, 28 cases were reported.

San Luis Potosi.—On October 21, 1916, typhus was stated to be epidemic.

Tampico.—Present in October, 1916.

Torreon.—Present in October, 1916.

Vera Cruz.—From July 24 to October 15, 1916, 9 fatal cases of typhus were reported.

Zacatecas, State.—From September 7 to October 25, 1916, typhus fever was reported prevalent.

NORTH AMERICA.

In North America typhus was reported in Canada, 4 cases being notified at St. John, New Brunswick, July 29, 1916, and 1 case at Ottawa, Ontario, in April, 1917.

SOUTH AMERICA.

In South America typhus was reported in Argentina, British Guiana, Colombia, and Venezuela.

Argentina.—At Rosario, during the month of November, 1916, 1 case of typhus was reported.

British Guiana.—At Georgetown 3 cases of typhus were reported in May, 1917.

Colombia.—At Medellin, in November, 1916, typhus fever was reported to be epidemic.

Venezuela.—At Maracaibo 3 cases of typhus were reported from April 15 to May 19, 1917.

INSULAR.

Typhus was reported present in the Canary Islands, Cuba, and Trinidad.

Canary Islands.—At Santa Cruz, from July 1 to August 5, 1 case was reported.

Cuba.—At Santiago there occurred a case of typhus in December, 1916.

Trinidad, West Indies.—Four cases of typhus were notified in the island of Trinidad during April, 1917.

YELLOW FEVER.

Yellow fever was reported present in Brazil, Ecuador, Mexico, and the West Indies.

Brazil.—In Brazil yellow fever was present in the State of Espirito Santo from January 27 to February 26, 1917, 18 cases with 4 deaths being reported. At Pernambuco 1 fatal case was notified in April, 1917.

Ecuador.—At Guayaquil from July 1 to December 31, 1916, 73 cases of yellow fever with 44 deaths were reported, and during the month of January, 1917, 17 cases with 7 deaths. The disease was present at Babahoyo and Chobo in November, 1916, with 1 case each; at Milagro from July 1 to October 31, 1916, with 6 cases, and in January, 1917, 1 case; at Naranjito, in August, 1916, with 2 cases.

Mexico.—At Campeche, Mexico, a fatal case of yellow fever was reported September 15, 1916. At Merida from July 1 to October 28, 1916, 29 cases were reported with 9 deaths; at Progreso, 2 cases, occurring in August and October, 1916. At Tuxpam the disease was present in October, 1916. On June 23 a fatal case of yellow fever was reported at Peto, State of Yucatan.

INSULAR.

West Indies—Barbados.—During the period from September 17 to December 2, 1917, 20 cases of yellow fever with 8 deaths were reported at Barbados.

Martinique.—On October 23, 1916, a fatal case of yellow fever was reported at Fort de France, Martinique.

Sanitary Legislation.

Court decisions and State and municipal laws, ordinances, and regulations pertaining to public health were published as in previous years until January 19, 1917, when their current publication in the Public Health Reports was discontinued owing to the scarcity of printing paper and the need for strict economy in printing. The collection and compilation of the laws, ordinances, and regulations, however, has been continued, and the material can be issued in annual volumes, as heretofore. This work is carried on for the information of legislators, officers of the Public Health Service, State, county, and city health officers, and others who are called upon to draft laws, ordinances, or regulations designed to protect the public against the ravages of preventable disease. The published volumes show the trend of legislation and make it possible to select laws and regulations which have proved workable and effective in actual practice. Requests for assistance in drafting public-health measures are complied with whenever possible.

SUMMARY OF STATE HEALTH LAWS AND REGULATIONS, 1916.

During the fiscal year ended June 30, 1917, the laws and regulations pertaining to public health, adopted in the several States during the calendar year 1916, were compiled and published in Reprint No. 406.

The series of these publications now includes five volumes, reprints numbered 200, 264, 279, 338, and 406. The laws and regulations were adopted during the period from July 1, 1911, to December 31, 1916.

The following is a summary of some of the more important public-health measures adopted during the calendar year 1916:

MORBIDITY REPORTS.

Laws or regulations requiring the reporting of communicable diseases were adopted, or existing laws modified, during the year 1916 in the following-named States: California, Colorado, Delaware, Illinois, Kansas, Maine, Maryland, Massachusetts, Mississippi, Minnesota, Montana, New Hampshire, New York, Rhode Island, Virginia, and West Virginia.

In Colorado the State board of health adopted regulations requiring the reporting of cases of communicable and occupational diseases to local health officers by physicians and other persons in attendance on patients. Local health officers are required to make and file copies of the reports and to forward the original reports without delay to the State board of health. (Public Health Reports, Sept. 29, 1916, p. 2730.) State institutions are required to report annually to the State board of health such information as that board may require. (Ibid., p. 2746.)

A Maryland law requires physicians to report immediately to local health officers cases of communicable diseases under their professional care. Local health officers must report to the State board of health within 24 hours. (Public Health Reports, Jan. 19, 1917, p. 160.)

A law passed in Rhode Island requires every physician or person having knowledge of cases of communicable disease to report immediately, upon blanks furnished by the State board of health, to the health officer of the town in which the patient is located. Town health officers are required to report weekly to the State board of health the number of cases notified and to make reports at other times if required by the State board of health. (Public Health Reports, Aug. 18, 1916, p. 2237.)

Tuberculosis.—A law passed in New York makes it the duty of every physician in the State of New York to report to the local health officer by telephone, or in person, or in writing on a form to be furnished, the name and address of every person known by said physician to have tuberculosis. Such reports are to be made within 24 hours after the physician secures knowledge of the case. (Public Health Reports, July 7, 1916, p. 1806.)

Registrars of vital statistics in the State of New York are required by law to report to the local health officers the names and addresses of persons reported to them as having died from tuberculosis. Local health officers are required to ascertain whether such persons have been previously reported as having tuberculosis, and, if it is found that physicians repeatedly fail to comply with the provisions of the law requiring the reporting of cases of tuberculosis, measures are to be taken to enforce the penalty for violation of the law. (Public Health Reports, July 7, 1916, p. 1807.)

A law of the State of Mississippi requires physicians, hospitals, and institutions for the treatment of tuberculosis to report within seven days all cases of the disease which they are called upon to examine or treat. Such reports must be made in accordance with the instructions of the State board of health. (Public Health Reports, Nov. 10, 1916, p. 3147.)

Poliomyelitis.—A regulation of the Virginia State Board of Health requires attending physicians immediately upon making a diagnosis

of poliomyelitis (infantile paralysis) to notify the local health officer and the State board of health of the existence and location of the case. (Public Health Reports, Oct. 27, 1916, p. 3022.)

A regulation of the State Board of Health of Montana requires physicians to report by the quickest possible method to local or county health officers all cases of poliomyelitis as soon as a diagnosis is made. Local health officers are required to report to the secretary of the State board of health by telegraph or telephone as soon as any case of the disease is reported to them, or as soon as they have made a diagnosis in a case attended by them. (Public Health Reports, Sept. 1, 1916, p. 2379.)

Ophthalmia neonatorum.—Laws or regulations requiring the reporting to local health officers of all cases of inflammation of the eyes of infants under two weeks of age were adopted during 1916 in Minnesota, Mississippi, and New Hampshire.

COMMUNICABLE DISEASES.

Quarantine.—Rules for the quarantining of communicable diseases were adopted during 1916 by the State boards of health of California, Colorado, Illinois, Kansas, Maine, Virginia, and West Virginia.

Tuberculosis.—Laws or regulations designed to protect communities against the spread of tuberculosis or to provide hospital treatment for sufferers from this disease were passed during the calendar year 1916 in California, the District of Columbia, Iowa, Massachusetts, Mississippi, New Jersey, New York, and Virginia.

In the District of Columbia a regulation adopted by the commissioners forbids the attendance at school of any person suffering from tuberculosis in a communicable form. (Public Health Reports, Oct. 27, 1916, p. 3017.)

The attendance at school of any person who is found upon examination of his sputum to have tuberculosis is forbidden by regulations adopted by the Iowa State Board of Health. These regulations also forbid the employment of tuberculous persons in places where foodstuffs are prepared or where "numbers of persons habitually congregate," as theaters, department stores, etc. (Public Health Reports, Dec. 22, 1916, p. 3479.)

The Legislature of the State of Massachusetts directed the State department of health to investigate "the matter of nonpulmonary tuberculosis with special reference to children and adolescents." (Public Health Reports, June 30, 1916, p. 1736.) Provision was made by law for paying to approved municipal or incorporated hospitals a subsidy of $5 per week for each patient who is unable to pay for his support. (Ibid., p. 1737.) Counties were required by law to provide hospital accommodations for tuberculous persons residing in towns or cities of less than 50,000 inhabitants, either by erecting hospitals or by making arrangements for the care of patients in existing hospitals. (Public Health Reports, Aug. 4, 1916, p. 2116.)

Regulations for the government of tuberculosis dispensaries were adopted by the Massachusetts State Department of Health. (Public Health Reports, Dec. 8, 1916, p. 3387.)

The Legislature of Mississippi made provision for the establishment of a State sanatorium for the treatment of tuberculosis, under

the management and control of the State board of health. (Public Health Reports, Nov. 10, 1916, pp. 3146–3147.)

A Virginia law authorizes circuit courts, upon the complaint of any member of a county or city board of health, to summon persons "suffering from tuberculosis who shall violate the laws prohibiting expectoration in public places and vehicles, or who shall deliberately and continuously place the health of any other person in danger of infection with such disease," and after a hearing to restrain such persons for a period not exceeding 12 months or place them under bond to cease the practices complained of. (Public Health Reports, Oct. 27, 1916, p. 3025.)

Provision was made by the Virginia Legislature for the establishment by counties or cities of tuberculosis sanitoria, to be under the control of the local board of health. (Ibid.)

The Virginia law authorizing cities and counties to provide funds for the purpose of assisting indigent persons to reach the State sanatorium and to help to maintain them while there was amended. (Ibid., p. 3026.)

ADVERTISING.

A number of States have recently adopted laws designed to prevent fraudulent advertising. The public-health feature of these laws has received little attention, but if enforced they will accomplish great good by preventing much of the advertising of so-called "patent" or "proprietary" medicines and by protecting the public against the consequences of extravagant statements of ability to cure venereal and other diseases, which are sometimes spread broadcast by quacks and unscrupulous practitioners. Laws of this nature were passed during the calendar year 1916 in Massachusetts, Virginia, and the District of Columbia.

MUNICIPAL HEALTH ORDINANCES AND REGULATIONS.

Another annual volume has been added to the series of Municipal Ordinances and Regulations Pertaining to the Public Health. The list now embraces seven volumes—reprints numbered 70, 121, 199, 230, 273, 364, and 388—which cover the period from January 1, 1910, to December 31, 1916.

While it is not possible, or perhaps desirable, to obtain all of the municipal enactments on the subjects included, the more important and carefully drawn ordinances and regulations are secured and published. In the annual volumes these are arranged by subjects, and the table of contents and index make it possible to secure ready access to the best measures relating to any phase of municipal public-health work.

SUMMARY OF COURT DECISIONS, 1916.

The publication of judicial opinions relating to matters affecting the public health was begun in the Public Health Reports in May, 1913. Their current publication was temporarily discontinued in January, 1917.

The opinions published prior to January 1, 1916, were compiled and published, with a digest, as Reprint from the Public Health

Reports, No. 342. Those published during the calendar year 1916 have been similarly compiled, indexed, a digest has been prepared, and they have been issued as Reprint No. 410.

The following is a digest of the more important opinions which were published during the calendar year 1916, omitting decisions which were referred to in the annual report of the Public Health Service for 1916:

HEALTH AUTHORITIES.

Powers of State legislature—Vaccination.—A State legislature has the power to authorize State or local boards of health to require vaccination of teachers and pupils as a condition to their being admitted to the public schools, even when smallpox is not present. [Ky.] (Public Health Reports, Dec. 29, 1916, p. 3551.)

Powers of State and local boards of health—Vaccination.—The Court of Appeals of Kentucky decided that when a smallpox epidemic threatens it is within the power of a State or local board of health to require all children attending school to be vaccinated. (Public Health Reports, Dec. 29, 1916, p. 3551.)

Powers of State board of health—Injunction.—Under the laws of Oregon the State board of health has authority to bring suit for an injunction to restrain the continuation of conditions which may endanger the health of the public. (Public Health Reports, Feb. 25, 1916, p. 465.)

Powers of State board of health—Taking of shellfish from contaminated waters.—A Massachusetts law prohibited the taking of shellfish from waters which had been declared by the State board of health to be contaminated by sewage or otherwise. The Supreme Judicial Court of Massachusetts decided that the law was constitutional and valid. (Public Health Reports, Sept. 1, 1916, p. 2377.)

Powers of cities and of local boards of health.—The Supreme Court of Oregon decided that the right of a State to enjoin a nuisance may be delegated to and exercised by a city or other power especially named for that purpose. (Public Health Reports, Feb. 25, 1916, p. 465.)

Employment of attorney by State board of health.—The Supreme Court of Illinois decided that the Illinois State Board of Health was without authority to employ an attorney and that an appropriation for this purpose made by the legislature was void. (Public Health Reports, Sept. 8, 1916, p. 2466.)

Orders of boards of health—Penalties must be fixed when order is made.—Under the law of the State of New York, local boards of health are authorized to make general and special orders for the protection of the public health and to prescribe and impose penalties for the violation of such orders. The board of health of the village of Carthage issued an order prohibiting a resident of the city from pumping the contents of his cesspool over the ground, but the board did not prescribe the penalty to be incurred if the order was violated. After the order had been disobeyed the board fixed the penalty at $50. The New York Court of Appeals decided that the board had no right after the commission of the offense to determine what the penalty should be. (Public Health Reports, Apr. 7, 1916, p. 911.)

Compensation of county health officer.—The North Carolina law authorized the county board of health to fix the salary of the county superintendent of health, subject to the approval of the board of county commissioners. The board of health of Harnett County elected a superintendent of health and fixed his salary at $600 per annum. The board of county commissioners refused to approve the salary for more than $300 per annum. He brought suit for the salary of $600. The court held that he could not recover more than $300. (Public Health Reports, May 5, 1916, p. 1147.)

LAWS, ORDINANCES, AND REGULATIONS—VALIDITY AND EFFECT.

To be valid as a health measure a statute or ordinance must provide real protection to the public health.—An ordinance of Nashville, N. C., prohibited the erection of a privy or stable nearer to a neighbor's residence than it was to the owner's. The North Carolina Supreme Court decided that the ordinance was void, as it failed to protect the health of the inhabitants of the town, "as under it stables may be kept with impunity obnoxiously near any number of dwellings if they are equally as near the dwelling of the owner of the stables. Thus, it is put within the power of the owner to annoy his neighbor at will if he is willing to endure the same annoyance himself." (Public Health Reports, Aug. 4, 1916, p. 2115.)

Subordinate city board can not nullify an ordinance of the city.—The municipality itself may, by ordinance, amend, alter, or repeal an ordinance; but a board, department, or commission of the municipal government can not, directly or indirectly, change the effect of an ordinance. (Public Health Reports, Jan. 14, 1916, p. 83.)

Ordinances must be reasonable and not unnecessarily burdensome.—An ordinance which prohibits the placing of tin cans, manure, ashes, or rubbish in a street or alley, or permitting such articles or substances to remain on a lot, is unreasonable and void, because the ordinance is unnecessarily burdensome and it makes no distinction between conditions which are harmful and those which would not affect health or comfort. [Kans.] (Public Health Reports, Sept. 8, 1916, p. 2465.)

Classifications must be reasonable.—Municipal rules must be reasonable; and a classification of apartment houses which excludes the inhabitants of certain apartments from the benefits of the removal of ashes because of the number of stories in the buildings and the fact that they have elevators is arbitrary and unreasonable. (Public Health Reports, Jan. 14, 1916, p. 83.)

DECISIONS RELATING TO CERTAIN COMMUNICABLE DISEASES.

Diphtheria—Diagnosis.—A physician is not liable for damages for failure to correctly diagnose a case of diphtheria unless he has been negligent or has displayed a lack of skill in his profession. [Wis.] (Public Health Reports, Sept. 8, 1916, p. 2466.)

Rabies—Prevention—Ordinance authorizing destruction of dogs not valid.—The Supreme Court of Oregon decided that an ordinance which provided for destroying impounded dogs without a judicial hearing, and in some cases without notice to the owners, was void as authorizing the taking of property without due process of law. (Public Health Reports, Feb. 4, 1916, p. 272.)

Typhoid fever—Evidence required to prove source of infection.—A city dump, where human excrement and bodies of dead animals were deposited, was located about 1,940 feet from plaintiff's dwelling. Members of the plaintiff's family contracted typhoid fever, but there was no evidence showing the source of the infection or that the bacillus typhosus existed at the dump. The Oklahoma Supreme Court held that the proof was insufficient to show that the dump was the cause of the disease. (Public Health Reports, Feb. 18, 1916, p. 396.)

Typhoid fever.—The contracting of typhoid fever by employees from drinking impure water furnished by the employer was held to be an accident arising out of the conduct of the business. (Public Health Reports, Aug. 18, 1916, p. 2235.)

Vaccination—School children—Power of legislature.—The legislature, in the exercise of its police power, may require or empower a local or administrative authority to require vaccination of teachers and pupils as a condition of their being admitted to the public schools, although smallpox be not prevalent or its outbreak be not apprehended. [Ky.] (Public Health Reports, Dec. 29, 1916, p. 3551.)

Syphilis.—The New Jersey Court of Chancery decided that the fact that one party to a marriage was afflicted with syphilis at the time of marriage is not sufficient to enable the court to annul the marriage in the absence of a statute authorizing such action. (Public Health Reports, Oct. 13, 1916, p. 2901.)

OCCUPATIONAL DISEASES AND WORKMEN'S COMPENSATION LAWS.

Connecticut—Occupational diseases not included in the Connecticut law.—The Supreme Court of Errors of Connecticut decided that it was not the intention of the Connecticut Legislature in passing the workmen's compensation law to make provision for paying compensation to workmen suffering from occupational diseases. (Public Health Reports, Oct. 6, 1916, p. 2797.)

Lead poisoning.—An employee of the American Steel & Wire Co., was incapacitated for a short time by lead poisoning which was contracted in the course of his employment. The Supreme Court of Errors of Connecticut decided that he was not entitled to compensation under the law of that State. (Public Health Reports, Oct. 6, 1916, p. 2797.)

Massachusetts—Occupational diseases not included in the Massachusetts law.—The Massachusetts workmen's compensation law as construed by the Massachusetts Supreme Judicial Court does not provide for compensation for occupational diseases as such. "Personal injury" is the only ground for compensation. But whatever is rightly described as a "personal injury," if received in the course of and arising out of the employment, becomes the basis for a claim. (Public Health Reports, July 14, 1916, p. 1877.)

Heart disease.—Under the Massachusetts workmen's compensation law, an employee who has a weak heart and whose work requires exertion which so aggravates and accelerates the disease as to incapacitate the employee is entitled to compensation. (Public Health Reports, July 14, 1916, p. 1877.)

Syphilis retarding recovery.—Claimant was injured and payments were made for some time under the Michigan workmen's compensation law. Recovery was retarded because the claimant was suffering from syphilis. The Michigan Supreme Court decided that it was impossible to determine what part of the period of disability was attributable to the injury and what part was caused by the disease. The order of the industrial accident board directing that payments be continued was affirmed. (Public Health Reports, Sept. 29, 1916, p. 2725.)

MILK.

License—Discrimination.—The Court of Appeals of Kentucky decided that an ordinance which imposes a license tax upon milk dealers is not void because it exempts from its provisions grocery stores selling milk where the grocery stores pay a license tax covering their entire business. (Public Health Reports, Sept. 29, 1916, p. 2727.)

Failure to register dairy—Penalty.—A California law required the registration of dairies. The defendant purchased milk from an unregistered dairy and refused to pay for it on the ground that the sale of milk from such a dairy was unlawful. The court held that the only penalty provided by the law for failure to register was fine or imprisonment; that the law did not make the sale of milk from an unregistered dairy unlawful; and that the milk must be paid for. (Public Health Reports, Sept. 15, 1916, p. 2523.)

FOODSTUFFS.

Shellfish from contaminated waters.—The Supreme Judicial Court of Massachusetts upheld a law which prohibited the taking of shellfish from waters which had been declared by the State board of health to be contaminated. (Public Health Reports, Sept. 1, 1916, p. 2377.)

Pork—Dealer held liable—Massachusetts.—Mrs. Gearing, acting as the agent of her husband, purchased from the defendants some pork chops. The chops were selected by one of the defendants, who sold them. They were eaten by Mrs. Gearing and her husband, and both were made ill. The findings of fact showed that the defendants had not been guilty of negligence. The court decided that under the laws of Massachusetts Mr. Gearing could recover damages for the breach of an implied warranty that the chops were sound and wholesome, but that the warranty did not extend to any person other than the purchaser. Consequently Mrs. Gearing could not recover. (Public Health Reports, Dec. 22, 1916, p. 3477.)

HABIT-FORMING DRUGS.

Oklahoma law—Unlawful selling.—The Criminal Court of Appeals of Oklahoma sustained a conviction under a State statute which prohibited the sale of habit-forming drugs except upon a physician's prescription. (Public Health Reports, Dec. 15, 1916, p. 3437.)

New York law—"Dispensing."—A physician who issues a prescription for narcotic drugs does not "dispense" the drugs within

the meaning of the New York public-health law. (Public Health Reports, Oct. 20, 1916, p. 2951.)

New York law—Physicians' records.—The New York public-health law requires persons who "sell, administer, prescribe, dispense, or dispose of" habit-forming drugs to keep a record of "the name and address of each person to whom such drug is dispensed." A physician issued prescriptions for habit-forming drugs and failed to keep records. The court held that he did not "dispense" them and that he was not required to keep records of such prescriptions. (Public Health Reports, Oct. 20, 1916, p. 2951.)

Texas law construed.—The Court of Criminal Appeals of Texas decided that it was not a violation of the Texas law for a physician to prescribe habit-forming drugs for the purpose of alleviating pain or curing a drug habit. (Public Health Reports, Sept. 15, 1916, p. 2525.)

DRUGS AND POISONS.

Sherley amendment.—The purpose of the Sherley amendment to the Federal pure food and drugs law was to punish false and fraudulent statements regarding the curative or therapeutic effects of drugs or any of their ingredients.

Jury found that statements on the label of a medicine which was shipped in interstate commerce were false and were intended to convey false impressions relative to the curative properties of the medicine. The court decided that the medicine was misbranded, and was liable to forfeiture, under the Sherley amendment to the Federal pure food and drugs law.

If the persons shipping medicines in interstate commerce honestly believe that the statements on the labels are true, the medicines are not misbranded within the meaning of the term "misbranded" as defined in the Sherley amendment. (Public Health Reports, Dec. 8, 1916, p. 3383.)

SEWAGE DISPOSAL—POLLUTION OF STREAMS.

Damages against city.—The New York Supreme Court held that the inhabitants of a city or village collectively have no more right to pollute the waters of a stream than has an individual, and if a city empties its sewage into a stream and injury results to owners of land along the stream, the city is liable for damages, and may be restrained by injunction. (Public Health Reports, Jan. 7, 1916, p. 29.)

Damages can be recovered against a city for discharging its sewage into a stream so as to pollute the water of the stream and injure lower property owners. (Public Health Reports, Dec. 15, 1916, p. 3431.)

No recovery for pollution from natural drainage.—When the natural surface drainage rendered the water of the stream unfit for use before the city discharged its sewage into the stream, damages could not be recovered against the city on the ground that the water could not be used after sewers were constructed. (Public Health Reports, Dec. 15, 1916, p. 3431.)

Law authorizing sewer system does not authorize the creation of a nuisance.—According to the Supreme Court of Wisconsin, legis-

lative authority to install a sewer system carries no implication of authority to create or maintain a nuisance, and if a nuisance be created by a city, the same remedies may be invoked as if the proprietor were an individual. (Public Health Reports, Dec. 8, 1916, p. 3385.)

Legislative authority to discharge sewage into a stream does not justify a city in creating a nuisance or in inflicting injuries which amount to the taking of property in a constitutional sense unless the city has acquired the right by condemnation and the payment of compensation. [Oreg.] (Public Health Reports, Feb. 25, 1916, p. 465.)

Distinction between navigable and small streams.—With legislative authority a city may discharge sewage into navigable or tidal streams if done in a proper manner, but it is doubtful if the legislature can authorize such use of a stream the bed and banks of which are in private ownership. (Public Health Reports, Feb. 25, 1916, p. 465.)

Time when suit must be begun.—Under the Kentucky statute limiting the time within which suits must be brought, damages can be recovered for pollution of streams if the injury was done within five years before the institution of the suit. (Public Health Reports, Dec. 15, 1916, p. 3431.)

The statute of Virginia required that such actions be brought within five years after the right of action accrued. Suit was begun within five years after sewage was discharged into the stream in sufficient quantity to work injury, but more than five years after the time when the first sewer was constructed. The Supreme Court of Virginia decided that the suit was begun in time. (Public Health Reports, Apr. 14, 1916, p. 970.)

Power of State board of health.—The Supreme Court of Oregon decided that the right of the State to enjoin a city from polluting a stream may be delegated to and exercised by the State board of health. (Public Health Reports, Feb. 25, 1916, p. 465.)

Damage to oyster beds.—The Supreme Court of Appeals of Virginia decided that a municipality has the right to discharge sewage into tidal waters, subject to the control of the State legislature, and a person who leases oyster beds from the State with knowledge of the polluted condition of the beds can not recover damages from the municipality because of such pollution. (Public Health Reports, Aug. 4, 1916, p. 2113.)

Damages and injunction against college.—A college constructed a sewer system which discharged into a small stream and polluted the water. Suit was brought by an owner of land on the stream. The court decided that the complainant was entitled to an injunction and to damages for the injury inflicted. [Va.] (Public Health Reports, Apr. 14, 1916, p. 970.)

MARINE HOSPITALS AND RELIEF.

RELIEF STATIONS.

During the fiscal year ended June 30, 1917, the service operated 19 marine hospitals, all of which are owned by the Government, and maintained 119 other relief stations where hospital and out-patient relief was furnished patients. In addition, the service maintained a sanatorium at Fort Stanton, N. Mex., for the care and treatment of patients suffering from tuberculosis. On account of the decrease in the number of patients treated at Pittsburgh, Pa., and Wilmington, N. C., the marine hospitals at those places were closed during the year and contracts made with local hospitals for the care of service patients.

RELIEF TO SEAMEN AND OTHER PATIENTS.

There were 64,033 patients treated at the various marine hospitals and relief stations of the service during the year, including the patients treated at the tuberculosis sanatorium at Fort Stanton, N. Mex. This number also includes patients treated by local physicians (93 in number) who were appointed to furnish professional services during the year to members of certain coast guard stations. Of the above-mentioned number 17,991 patients were treated in hospitals a total of 500,578 days, and 46,031 patients were treated at dispensaries a total of 102,228 times. During the same period 366 foreign seamen were furnished 8,220 days' hospital treatment. In addition to the foregoing, medical officers detailed for duty on board various vessels of the Coast Guard furnished a great deal of medical relief both to beneficiaries of the service and to the natives of Alaska.

PHYSICAL EXAMINATIONS.

The medical officers of the service made 28,356 physical examinations of candidates for various positions during the year, as noted under the special headings given below:

United States Coast Guard.—Three thousand one hundred and ninety-eight applicants were examined, of whom 1,230 were rejected.

Post Office Department.—Two hundred and forty-two applicants were examined, of whom 10 were rejected.

Coast and Geodetic Survey.—Two hundred and thirty-five applicants were examined, of whom 17 were rejected.

Lighthouse Service.—One hundred and four applicants were examined, of whom 14 were rejected.

Immigration Service.—One thousand seven hundred and sixty persons were examined on account of the Immigration Service, of whom 443 were rejected.

Civil Service Commission.—One thousand nine hundred and forty-two applicants were examined, of whom 212 were rejected.

Panama Canal.—One applicant was examined and passed.

Philippine Islands.—Twelve applicants were examined and passed.

Alaska Engineering Commission.—Six hundred and seventy applicants were examined, of whom 94 were rejected.

United States Navy.—Fourteen applicants were examined and passed.

United States Army.—One applicant was examined and passed.

Bureau of Education.—Four applicants were examined and passed.

Steamboat-Inspection Service.—Five thousand nine hundred and eighty-nine applicants were examined, of whom 125 were rejected.

Merchant seamen of the United States.—Eleven thousand three hundred and seventy-three American seamen were examined, of which number 1,225 were rejected.

Foreign seamen.—Two thousand eight hundred and five foreign seamen were examined for service, of whom 239 were rejected.

PURVEYING DEPOT.

The following statistics show the transactions of the purveying depot during the fiscal year:

Supplies purchased.

Drugs and chemicals	$23,551.92
Surgical instruments and appliances	13,453.58
Beds, bedding, etc	12,665.50
Dry goods	4,157.23
Furniture	3,058.68
Miscellaneous	3,310.96
Subsistence stores	2,923.83
Kitchen utensils and table ware	1,962.58
Rubber goods	1,290.97
Books and journals	940.85
Bacteriological supplies	766.70
Hardware	739.42
Alcohol, wines, etc	534.70
Glass bottles	449.37
Packing materials	440.47
Flags	305.40
Pharmacal implements	199.70
Electric lamps	89.28
Total	70,841.14

Credit.

By bills paid direct from funds:		
Maintenance	$7,276.32	
Care of seamen	1,038.05	
Furniture	878.84	
Quarantine	694.56	
Special studies of pellagra	519.73	
Prevention interstate spread of disease	487.50	
United States Immigration Service	448.62	
Field investigations	377.57	
Columbia River quarantine	104.22	
Epidemic	65.37	
		11,890.78
Total		58,950.36

By amounts reimbursed from other appropriations for supplies issued from stock:		
Quarantine	$2,546.63	
Medical Department, United States Navy	2,108.30	
Epidemic fund	2,051.61	
Columbia River quarantine	413.86	
United States Immigration Service	388.15	
Field investigations	249.65	
Special studies of pellagra	108.82	
Interstate quarantine	39.50	
Contingent expenses, miscellaneous, Treasury Department	19.05	
Rural sanitation	10.40	
Field investigations	7.50	
United States Coast Guard	7.09	
		$7,950.56
Net expenditures chargeable to appropriations for purveying depot (in amount $51,000)		50,999.80
Salaries	$6,897.33	
Operating expenses	209.65	
		7,106.98
Total net expenditures		58,106.78
Number of requisitions filled		766
Number of packages shipped from depot		2,409
Total weight of supplies shipped from depot (pounds)		185,945
Total weight of supplies shipped direct to stations by contractors (pounds)		121,297

TUBERCULOSIS SANATORIUM AT FORT STANTON, N. MEX.

REPORT FOR THE YEAR ENDED JUNE 30, 1917, BY F. H. M'KEON, SURGEON.

General information.

Number of patients present July 1, 1916	197
Number of patients admitted during the year	130
Total number treated during the year	327
Number of patients discharged during the year	109
Number of deaths (included in preceding item)	43
Number of bodies interred in sanatorium cemetery	42
Number of patients present June 30, 1917	218
Maximum number of patients during the year	234
Minimum number of patients during the year	187
Total number of days' treatment furnished patients	77,272
Number of officers and attendants	98
Number of patients who left against advice	35
Number of patients discharged for causes affecting discipline	1
Number of patients transferred to other stations	3
Number of physical examinations made during the year	1,273
Number of patients who returned at their own expense	19
Number of patients retransferred	9
Total number readmitted	28

Average duration of stay of patients discharged, 1 year 9 months 3 days.
Minimum stay, 3 days.
Maximum stay, 9 years 11 months 26 days.

Patients discharged during the year, with stage of disease and result of treatment.

	Apparently cured.	Arrested.	Improved	Not improved.	Quiescent.	Died.	Total.
Incipient	4						4
Moderately advanced	1	10	3	4	1	7	26
Far advanced		13	17	11	2	35	78
Not examined						1	1
Total	5	23	20	15	3	43	109
Average stay in days	425	665	402	352	496	771	

Eighty-one and five-tenths per cent of the cases were far advanced when received. Of the 43 who died, 17 remained over 2 years, 10 between 1 and 2 years, 7 between 6 and 12 months, 5 between 3 and 6 months, and 4 less than 3 months. One patient died on the third day after arrival. Twenty-six necropsies were performed.

Prognosis on arrival.

Favorable for apparent cure	1
Favorable for arrest	42
Favorable	12
Favorable for prolongation of life by living under proper conditions	41
Doubtful	3
Unfavorable	8
No prognosis	1
Not examined	1
Total	109

CAUSES OF DEATH.

Of the 43 deaths which occurred during the year, 4 were due to massive hemorrhage, 1 to septic pneumonia, 1 to tuberculous meningitis, 1 to tuberculosis of the pons, 1 to pulmonary embolism, and fibrous pericarditis, 2 to pericarditis, 2 to tuberculous enteritis, 3 to nephritis, 1 to suicide, and 2 to insanity. It will be understood that all the special cases of death mentioned above occurred in cases which were complicated by advanced pulmonary tuberculosis. Twenty-five deaths were registered as being caused by tuberculosis of the lungs, uncomplicated.

TREATMENT.

Methods of treatment in vogue during the fiscal year ending June 30, 1916, have not been materially altered during the fiscal year for which this report is made. Therapeutic pneumothorax has been continued in 17 selected cases, with results that have been generally satisfactory.

Continuing the policy inaugurated by Surg. F. C. Smith, only selected cases have been given this treatment, the selection being based upon the opinion of a board of medical officers. The total number of such treatments given during the year was 209, the largest number given to one patient being 17.

The investigation into pyorrhea alveolaris has been discontinued, for the reason that the results obtained by treatment with emetine

proved to be unsatisfactory. It is believed that this finding is in accord with the findings of physicans throughout the country who have pursued such investigations. However, an effort has been made to place every patient's mouth in such condition as would enable him to properly masticate his food, for the obvious reason that the tuberculous individual with poor teeth or insanitary dental condition must necessarily be greatly handicapped in benefiting by institutional treatment.

The station dentist rendered the usual institutional relief, which included 170 extractions, 248 fillings, and 1,397 other treatments.

Eye, ear, nose, and throat treatments numbered 1,974.

Forty-seven surgical operations were performed.

Routine sanatorium treatment consisted of rest, regulated diet, and in selected cases, exercise. Work squads, who performed special detail, performed 5,505 hours of labor, and those who took exercise in the form of walking, 578 hours. The earnings of patients privately employed amounted to $4,055.65, while patients convalescent or recovered, who were employed as attendants, received $13,031.04.

The work done by the laboratory was largely routine, consisting of examinations of sputa and urine. Specimens of blood have been taken by the laboratory force from a vein in the forearm for transmission to the Hygienic Laboratory for the Wassermann test. It has been found that a small percentage of patients under treatment at Fort Stanton are positive for the Wassermann test. In selected cases, antisyphilitic treatment with neo-salvarsan, salvarsan, and succinimide of mercury has been given with gratifying results.

AMUSEMENTS.

The moving-picture show of the Amusement Association has been continued, performances being given twice weekly for the benefit of patients and attendants. A number of special entertainments were provided during the year. In the summer of 1916, a baseball team, consisting of nontuberculous attendants, played a number of games with neighboring teams at such times as their duties permitted. A considerable number of patients have, with the permission of this office, organized themselves into a social club, not only with the idea of providing considerable social recreation but with the further idea of building up a spirit of loyalty to the sanatorium and to the Government.

This club operates a pool table and at times has given light entertainments in the way of vaudeville performances for the benefit of all patients at Fort Stanton.

ECONOMIES.

Forty-one and one-half gallons of liquid soap and 3,500 gallons of soft soap were made and used, waste tallow being generally used in the making. Sixty quarts of flavoring extracts for use in the bake shops and kitchen were made in the dispensary, which department also made most of the baking powder used in the station kitchens.

The practice of using powder and solid extracts and drugs in stock to make up tinctures has been continued. Twenty-one pillows were remade. Seventy-one hospital pajamas, as well as 328 sheets and 526 pillowcases and 202 kitchen aprons, were made by station labor.

An alteration to building No. 10, used as the station infirmary, consisting of a diet kitchen, was made by station labor and material under authority from the bureau and the Supervising Architect. This alteration fills a long-felt need, and the fact that it was made entirely from material on hand and with the station force, who were already quite well occupied with routine work, would seem to indicate that it constituted an economy.

The property and stock accounting system, which was developed by Surg. F. C. Smith, has been continued in force, and has resulted in considerable saving of property.

COST OF MAINTENANCE.

The cost per diem per patient was $1.7948, showing a slight decrease over the cost per diem per patient for the previous year. There has been no attempt to stint patients in the matter of diet, but reasonable economies have been effected wherever possible.

The figure given above is based on all items of expenditure, less reimbursements from officers and others for subsistence supplies ($2,997.44) and receipts from the sale of beef hides, cement and grain sacks, horses, and condemned rubber goods ($2,501.39). If reimbursements are not considered, the cost per patient per day amounts to $1.8665. The purchased ration cost $0.3599 per capita, and the cost of ration, including station products figured at market prices, amounted to $0.6785 per capita.

Repairs and renewals of mechanical equipment amounted to $5,188.43. The sum of $11,600 for concreting the south reservoir was charged on last year's report, and is not included in the amount given above. The concreting of the south reservoir was completed during the current fiscal year, and payment has been nearly completed. The transaction will be closed at the time there has been a depth of 6 feet of water in the reservoir for a sufficient length of time to determine that there is no leakage. When this construction was completed, it was expected that the tank would be filled by a pipe line to be put in by the E. P. & S. W. R. R. system; but since the railroad has taken no action, a filling has been begun from the station water supply, No. 3 pump being operated about 9 hours per day for this purpose. The process is necessarily slow, and at the time this report is made there is something less than a depth of 5 feet of water in the reservoir.

LIBRARY.

There is maintained at Fort Stanton for the benefit of officers, patients, and attendants, a circulating library without expense to the Government. On June 30, 1917, there were 3,398 bound volumes, comprising fiction, 2,606; miscellaneous subjects, including religion, travel, history, science, etc., 792.

From private funds contributed at this station, 26 magazines and 1 daily paper are subscribed for. During the fiscal year just ended, a donation of 80 bound volumes was received from the Syracuse Library of New York.

As will readily be understood, the circulating library has given a considerable amount of healthy recreation and instruction to patients

at this station. The magazines above referred to include a number of magazines devoted to tuberculosis work, and the information contained in these publications has had a salutary effect in impressing upon the patients the necessity of following the strict régime of the sanatorium.

It is to be regretted that the Government has never seen fit to contribute in any way to the support of the library.

FARM AND HERD.

On June 30 there were approximately 2,022 (range herd 1,832, dairy herd 190) cattle. The operations of the cattle and dairy herds, reckoning beef at market prices and milk at the cost of production, has shown a slight profit. The profit for the year ending June 30, 1917, has been cut down considerably because of weather conditions, the precipitation having been less during the months beginning January 1 and ending June 30 than has been the case for a number of years in this section of the country.

It may be stated that the number of cattle on hand as shown above does not include 23 registered Hereford bulls, received after July 1, 1917.

The hog herd has also shown considerable profit, and it is believed that during the fiscal year 1918 it will be possible to cure ham and bacon at considerable saving to the Government. There were on hand July 30, 642 hogs.

Poultry and garden products have been produced at a loss, but it is believed that owing to the facts that early in the summer it was possible to practice irrigation upon the station garden, and because of the bureau allowing the employment of three additional men, that the garden during the fiscal year 1918 will be operated at a profit rather than a loss, which has been the case heretofore.

The total number of horses and mules on hand June 30 was 70. While there was a considerable number of deaths during the year among the cattle, hogs, and horses, there were practically no deaths due to preventable diseases.

Items of expenditure

Item.	Amount.	Per patient per day.
Salaries:		
Medical officers and pharmacist	$9,325.84	$0.1231
Office force	4,826.16	.0138
Power plant	2,820.00	.0365
Mechanics	2,539.66	.0329
Nurses and orderlies	3,594.00	.0465
Cooks and waiters	5,998.67	.0762
Laundry	1,320.00	.0171
Dairy	2,008.84	.0260
General	2,252.17	.0291
Poultry and hogs	402.00	.0052
Range	840.00	.0109
Corral	420.00	.0054
Farm	4,977.00	.0644
Total	41,324.34	.5348

Items of expenditure—Continued.

Item.	Amount.	Per patient per day.
Materials and supplies:		
Subsistence supplies	$37,869.01	$0.4901
Forage	22,072.18	.2856
Power plant	11,038.04	.1429
Range	9,284.95	.1201
Wood	4,889.17	.0635
Mechanical equipment for public buildings	3,443.32	.0446
Repairs and preservation of public buildings	1,745.11	.0226
Laundry	3,020.21	.0391
Table and kitchenware	2,357.05	.0305
Miscellaneous	2,253.21	.0290
Freight and transportation	2,235.02	.0290
Corral	305.96	.0040
Farm	633.46	.0082
Care of insane seamen at State Asylum	444.00	.0058
Furniture	189.31	.0025
Dairy	420.00	.0054
Office equipment	181.20	.0023
Dispensary and laboratory	18.42	.0002
Telephone	36.85	.0005
Tools (other than for power plant)	32.98	.0004
Purveying depot supplies	436.33	.0056
Total	102,906.53	1.3317
Salaries	41,324.34	.5348
Total expenditures	144,230.81	1.8665
Reimbursements from officers and others for subsistence supplies. $2,997.44		
Receipts from sale of beef hides, cement sacks, horses, and condemned rubber goods 2,501.39		
	5,498.83	.0717
Net expenditure	138,732.04	1.7948

PERSONNEL.

Under authority of section 4 of the act of Congress approved July 1, 1902, the President issued an Executive order constituting the Public Health Service a part of the military forces in time of actual or threatened war, and the following bulletin was issued by the War Department:

Bulletin No. 21.

WAR DEPARTMENT,
Washington, April 21, 1917.

The following Executive order is published to the Army for the information and guidance of all concerned:

Executive order.

Under the authority of the act of Congress, approved July 1, 1902, and subject to the limitations therein expressed, it is ordered that hereafter in times of threatened or actual war the Public Health Service shall constitute a part of the military forces of the United States, and in times of threatened or actual war, the Secretary of the Treasury may, upon request of the Secretary of War or the Secretary of the Navy, detail officers or employees of said service for duty either with the Army or the Navy. All the stations of the Public Health Service are hereby made available for the reception of sick and wounded officers and men, or for such other purposes as shall promote the public interest in connection with military operations.

WOODROW WILSON.

THE WHITE HOUSE,
3 April, 1917.

By order of the Secretary of War:

H. L. SCOTT,
Major General, Chief of Staff.

Official:
H. P. MCCAIN,
The Adjutant General.

Under this authority, the Secretary of the Navy on June 13, 1917, made the following request:

SIR: Many of the experienced sanitarians of the Navy are now engaged upon important work with the fleet, and at other places, and the Navy Department desires to take advantage of the provisions of the act of July 1, 1902, by obtaining a detail of 15 sanitarians of the Public Health Service for duty with the Navy, and such detail of officers is hereby requested.

The Surgeon General of the Navy has discussed informally this matter with Surg. Gen. Blue, and acquainted him with the purposes of the services of these men.

Sincerely, yours,

JOSEPHUS DANIELS.

The honorable the SECRETARY OF THE TREASURY,
Washington, D. C.

In accordance with this request, 13 commissioned medical officers were detailed to that department, and 1 commissioned officer to the

Surgeon General of the Army upon the request of that department. These trained medical officers are acting as sanitary advisers at military cantonments and shore stations of the Navy.

In accordance with the act of June 27, 1914, 16 commissioned medical officers are serving upon Coast Guard cutters in the Navy upon outside patrol duty, and 1 officer, under the approval of the President, was detailed to the hospital relief ship *Surf*.

Congress, recognizing the fact that these officers were serving in actual warfare, and upon distant stations beyond the sea, passed the following joint resolution, which was approved by the President July 9, 1917:

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That when officers of the United States Public Health Service are serving on Coast Guard vessels in time of war, or are detailed in time of war for duty with the Army or Navy in accordance with law, they shall be entitled to pensions for themselves and widows and children, if any, as are now provided for officers of corresponding grade and length of service of the Coast Guard, Army or Navy, as the case may be, and shall be subject to the laws prescribed for the government of the service to which they are respectively detailed.

Certain questions having arisen as to the scope and protection afforded by this joint resolution, it was submitted to the Comptroller of the Treasury for decision, and under date of August 6, 1917, he stated as follows:

As this resolution was originally passed by the Senate it provided that officers serving under the prescribed details should be entitled to "all the rights, privileges, benefits, and allowances, including rights to pensions * * * as are now provided for officers of corresponding grade and length of service in the Coast Guard." But it was amended in the House and the provision granting "all the rights, privileges, benefits, and allowances" was stricken out so that the resolution as finally enacted into law makes these officers subject to the laws prescribed for the government of the service to which they are respectively detailed but gives them no rights, privileges, benefits, or allowances other than pensions. In this connection see Congressional Record of June 28, 1917.

You are advised, therefore, that commissioned officers of the Public Health Service, detailed for service with the Navy, are entitled to only the pay and allowances which they are entitled by law to receive when not so detailed, that is to say, when performing their regular duties under the direction of the Secretary of the Treasury.

It will therefore be seen that this resolution, originally intended to give these officers equal status and protection while serving at the front with the other military forces, failed to carry out the intention.

The subject is deserving of serious consideration and proper legislation, because all medical officers are liable to military service at the front, should the necessity arise.

COMMISSIONED MEDICAL OFFICERS.

At the commencement of the fiscal year, July 1, 1916, the commissioned corps consisted of the Surgeon General, 1 assistant surgeon general at large, 13 senior surgeons, 72 surgeons, 37 passed assistant surgeons, and 63 assistant surgeons.

The changes during the fiscal year were as follows: One surgeon was promoted to grade of senior surgeon to fill vacancy; 2 passed assistant surgeons were promoted to the grade of surgeon; 9 assistant surgeons to the grade of passed assistant surgeon; and 29 candidates, who passed the examination required by the Laws and Regulations

of the Service, were commissioned assistant surgeons. On account of physical disability, 1 senior surgeon, 3 surgeons, and 2 passed assistant surgeons continued on waiting orders, and 2 senior surgeons were placed on waiting orders. Of this number, 3 have died and 1 has resigned during the fiscal year.

At the close of the fiscal year the commissioned medical corps consisted of the Surgeon General, 1 assistant surgeon general at large, 14 senior surgeons, 70 surgeons, 44 passed assistant surgeons, and 82 assistant surgeons. One senior surgeon and 5 surgeons were upon detail in the bureau as assistant surgeons general, in accordance with the act approved July 1, 1902.

Assignments.—Among other assignments of commissioned medical officers during the fiscal year were the following: Twenty-four were assigned to exclusive immigration duty, their services being supplemented by employment of acting assistant surgeons; 4 to the quarantine service of the Philippine Islands; 16 to vessels of the Coast Guard; 23 to the quarantine stations in the continental United States, Porto Rico, and the Hawaiian Islands; 3 to duty in foreign countries to prevent the introduction of epidemic diseases into the United States.

Special details.—One commissioned medical officer continued on detail duty under the governor of the Panama Canal. Surg. John D. Long was continued as chief quarantine officer and director of health of the Philippine Islands.

Field investigations of Public Health.—In accordance with the act of Congress approved August 4, 1912, authorizing the service to study and investigate the diseases of man and conditions influencing the propagation and spread thereof, including sanitation and sewage and the pollution, either directly or indirectly, of the navigable streams and lakes of the United States, the following officers and corps of special assistants were detailed to make these special investigations:

RURAL SANITATION.

[Headquarters, U. S. Marine Hospital, St. Louis, Mo.]

Surg. L. L. LUMSDEN, in charge.
Asst. Surg. W. H. SLAUGHTER.
Asst. Surg. J. G. TOWNSEND.
Asst. Surg. R. E. WYNNE.
Asst. Surg. W. C. WITTE.
Asst. Surg. R. L. DE SAUSSURE.
Asst. Surg. THOS. PARRAN.
Asst. Surg. H. S. MUSTARD.
Asst. Surg. J. D. APPLEWHITE.
Asst. Surg. R. P. SANDIDGE.
Asst. Surg. M. V. ZIEGLER.
Sanitary Engineer W. G. STROMQUIST.
Asst. Epidemiologist C. C. APPLEWHITE.
Asst. Epidemiologist W. K. SHARP, Jr.
Field Investigator A. F. ALLEN.
Field Investigator G. S. BOTE.
Field Investigator F. T. FOARD, Jr.
Field Investigator M. F. HARALSON.
Field Investigator I. B. KRAUSE.
Field Investigator L. B. MATTHEWS.
Field Investigator S. R. MCKAY.
Field Investigator M. J. QUINN.
Field Investigator H. C. ROBLES.
Field Investigator P. L. RUSH.
Field Investigator SAM. SAUNDERS.
Field Investigator W. C. VERDERY.
Field Investigator J. B. WEBB.
Field Investigator QUINTARD TAYLOR.
Field Investigator K. R. GLENNAN.
Field Investigator W. L. WOOD.

MALARIA.

[Headquarters, Marine Hospital, New Orleans, La.]

Asst. Surg. Gen. H. R. CARTER, in charge.
Surg. L. D. FRICKS.
Asst. Surg. R. C. DERIVAUX.
Asst. Surg. L. L. WILLIAMS, Jr.
Sanitary Engineer J. A. A. LE PRINCE.
Asst. Sanitary Engineer C. P. RHYNUS.
Technical Asst. M. B. MITZMAIN.
Asst. Epidemiologist T. H. D. GRIFFITTS.
Asst. Epidemiologist J. C. GEIGER.

PELLAGRA.

[Headquarters, Hygienic Laboratory, Washington, D. C.]

Surg. JOS. GOLDBERGER, in charge.

Field Station, Spartanburg, S. C.

Asst. Surg. G. A. WHEELER, in immediate charge.
Asst. Surg. P. M. STEWART.
Asst. Surg. W. S. BEAN, Jr.
Asst. Surg. J. D. REICHARD.
Asst. Surg. R. E. DYER.
Asst. Surg. M. C. EDMUNDS.
Public Health Statistician EDGAR SYDENSTRICKER.
Public Health Statistician W. I. KING.
Field Investigator HOWELL B. COBB.

PELLAGRA—Continued.

Field Station, Spartanburg, S. C.—Contd.

Field Investigator GEORGE A. DECELL.
Field Investigator JOHNSON C. GOUGE.
Field Investigator W. W. JENKINS.
Field Investigator REX W. LAUCK.
Field Investigator JOHN M. MATHERS.
Field Investigator ARCHIE N. MEANS.
Field Investigator JESSE B. NORMAN.
Field Investigator JAMES W. PLYLER.
Field Investigator LINDSAY SWOFFORD.
Field Investigator JAY D. WAITE.
Field Investigator RALPH WALDEN.

State Sanatorium, Milledgeville, Ga.

Asst. Surg. W. F. TANNER, in charge.

Pellagra Hospital and Laboratory, Spartanburg, S. C.

Passed Asst. Surg. R. M. GRIMM, in charge.
Asst. Surg. C. H. WARING.
Pharmacist L. G. SMITH.
Biochemist M. X. SULLIVAN.
Asst. Biochemist PAUL DAWSON.
Food Analyst KENNETH K. JONES.
Physiological Chemist R. E. STANTON.
Dietitian MAUD FAUQUIER.

PREVENTION OF TRACHOMA.

[Headquarters, Post-office Building, Lexington, Ky.]

Surg. JOHN MCMULLEN, in charge.
Pharmacist CHAS. G. CARLTON.

Trachoma Hospital, Cocburn, Va.

Acting Asst. Surg. C. E. DOWNES, in charge.

Trachoma Hospital, Jackson, Ky.

Acting Asst. Surg. T. F. WICKLIFFE, in charge.

Trachoma Hospital, London, Ky.

Acting Asst. Surg. JOS. C. JOHNSTON, in charge.

Trachoma Hospital, Pikeville, Ky.

Acting Asst. Surg. R. W. RAYNOR, in charge.

Trachoma Hospital, Tazewell, Tenn.

Acting Asst. Surg. J. L. GOODWIN, in charge.

Trachoma Hospital, Welch, W. Va.

Asst. Surg. PAUL D. MOSSMAN, in charge.

INVESTIGATION OF NAVIGABLE WATERS.

[Headquarters, Third and Kilgour Streets, Cincinnati, Ohio.]

Surg. W. H. FROST, in charge.
Passed Asst. Surg. PAUL PREBLE.
Asst. Surg. H. F. SMITH.
Pharmacist F. A. SOUTHARD.
Epidemiologist A. W. FREEMAN.
Sanitary Engineer R. E. TARBETT.
Sanitary Engineer J. K. HOSKINS.
Sanitary Engineer H. W. STREETER.
Sanitary Engineer H. R. CROHURST.
Plankton Expert W. C. PURDY.
Sanitary Bacteriologist E. M. MEYER.
Sanitary Bacteriologist E. E. SMITH 2D.
Sanitary Bacteriologist C. T. BUTTERFIELD.

POLLUTION OF COASTAL WATERS.

[Headquarters, Hygienic Laboratory, Washington, D. C.]

Passed Asst. Surg. F. A. CARMELIA, in temporary charge.
Asst. Surg. C. E. WALLER.
Sanitary Engineer C. N. HARRUB.
Sanitary Bacteriologist SOL PINCUS.
Sanitary Bacteriologist C. H. SPAULDING.

SEWAGE DISPOSAL AND INDUSTRIAL WASTES INVESTIGATIONS.

[Headquarters, Hygienic Laboratory, Washington, D. C. Field laboratories at Cincinnati, Ohio, Luray, Va., Noblesville, Ind., Grove City, Pa., Amelia, Ohio, and Chevy Chase, Md.]
Prof. EARLE B. PHELPS, in charge.

SEWAGE DISPOSAL.

Sanitary Engineer L. C. FRANK.
Sanitary Bacteriologist H. L. SHOUB.

INDUSTRIAL WASTES INVESTIGATIONS.

Sanitary Chemist H. B. HOMMON.
Sanitary Chemist H. P. CORSON.
Sanitary Engineer H. H. WAGENHALS.
Asst. Sanitary Engineer A. W. FUCHS.
Sanitary Bacteriologist J. W. MCBURNEY.
Sanitary Bacteriologist E. J. THERIAULT.
Sanitary Bacteriologist M. V. VELDEE.

SCHOOL HYGIENE.

[Headquarters, 414 Winder Building, Washington, D. C.]

Surg. T. CLARK, in charge.
Asst. Surg. W. L. TREADWAY.

INDUSTRIAL HYGIENE.

[Headquarters, Marine Hospital, Pittsburgh, Pa.]

Surg. J. W. SCHERESCHEWSKY, in charge.
Passed Asst. Surg. ROBERT OLESEN.
Passed Asst. Surg. J. A. WATKINS.
Asst. Physicist D. H. TUCK.
Scientific Assistant WM. P. BRAMLETT.
Scientific Assistant F. N. CLIFF.
Scientific Assistant L. W. JOHNSON.
Scientific Assistant GRACE G. KEECH.
Scientific Assistant M. E. STEINBERG.

MINE SANITATION.

Passed Asst. Surg. A. J. LANZA, School of Mines, Butte, Mont.
Asst. Surg. J. F. WORLEY, Mine Rescue Car No. 1, with station at Reno, Nev.
Asst. Surg. R. R. SAYERS, Mine Rescue Car No. 5, with station at Butte, Mont.
Asst. Surg. R. C. WILLIAMS, Mine Rescue Car No. 2, with station at Raton, N. Mex.

INDUSTRIAL HYGIENE WITH REFERENCE TO HEALTH INSURANCE.

Surg. B. S. WARREN, 416 Winder Building, Washington, D. C.

COOPERATION WITH BUREAU OF CHEMISTRY IN ENFORCING PURE FOOD AND DRUGS ACT.

Surg. M. W. GLOVER.

COOPERATION WITH OFFICE OF PUBLIC ROADS AND RURAL ENGINEERING.

Passed Asst. Surg. W. F. DRAPER.

Plague-eradicative measures.—The following officers were detailed for duty in plague-eradicative measures in the States of Louisiana, California, and Washington:

LOUISIANA.

Passed Asst. Surg. F. SIMPSON, in charge.
Asst. Surg. W. C. TEUFEL, in charge of laboratory.

Officers in charge of districts.

Passed Asst. Surg. J. H. SMITH, Jr.
Asst. Surg. H. C. CODY.
Acting Asst. Surg. M. D. HOLLIS.
Acting Asst. Surg. PERCY AHRONS.
Acting Asst. Surg. PARK HOWELL.

LOUISIANA—Continued.

Acting Asst. Surg. G. McG. STEWART.

CALIFORNIA.

Passed Asst. Surg. C. L. WILLIAMS, in charge.

WASHINGTON.

Surg. B. J. LLOYD, in charge.
Passed Asst. Surg. E. KRULISH.

Public-health laboratories were established at different stations of the service for the prevention of the interstate spread of disease and the carrying out of sanitary measures, as follows:

ELLIS ISLAND, N. Y.

Passed Asst. Surg. C. W. CHAPIN, in charge.

PITTSBURGH, PA.

Marine Hospital.

Surg. J. W. SCHERESCHEWSKY, in charge.

CINCINNATI, OHIO.

Third and Kilgour Streets.

Surg. W. H. FROST, in charge.

CHICAGO, ILL.

Marine Hospital.

Surg. J. O. COBB, in charge.
Sanitary Engineer H. P. LETTON.

ST. LOUIS, MO.

Marine Hospital.

Surg. L. L. LUMSDEN, in charge.

SAVANNAH, GA.

Marine Hospital.

Passed Asst. Surg. J. R. RIDLON, in charge.

NEW ORLEANS, LA.

Marine Hospital.

Asst. Surg. Gen. H. R. CARTER, in charge.

163 Dryades Street (Plague).

Asst. Surg. W. C. TEUFEL, in charge.

FORT STANTON, N. MEX.

Surg. F. H. McKEON, in charge.

SEATTLE, WASH.

No. 416 Central Building.

Surg. B. J. LLOYD, in charge.

SAN FRANCISCO, CAL.

Army and De Haro Streets (Plague).

Passed Asst. Surg. C. L. WILLIAMS, in charge.

HONOLULU, HAWAII.

Surg. F. E. TROTTER, in charge.

Prevention of introduction of typhus fever from Mexico.—The following officers were detailed for duty in the prevention of the introduction of typhus fever from Mexico:

Surg. E. FRANCIS, Laredo, Tex.
Asst. Surg. C. R. ESKEY, Eagle Pass, Tex.
Asst. Surg. J. W. TAPPAN, El Paso, Tex.
Acting Asst. Surg. H. B. ROSS, Del Rio, Tex.
Acting Asst. Surg. LEA HUME, Eagle Pass, Tex.
Acting Asst. Surg. H. J. HAMILTON, Laredo, Tex.
Acting Asst. Surg. J. H. HUNTER, Rio Grande City, Tex.
Acting Asst. Surg. W. P. WOODALL, Hidalgo, Tex.
Acting Asst. Surg. G. D. FAIRBANKS, Brownsville, Tex.
Acting Asst. Surg. A. L. GUSTETTER, Nogales, Ariz.
Acting Asst. Surg. B. C. TARBELL, Naco, Ariz.
Acting Asst. Surg. E. W. ADAMSON, Douglas, Ariz.

Personnel, Hygienic Laboratory.—At the close of the fiscal year there were on duty in the Hygienic Laboratory, in addition to the director, 3 chiefs of divisions, 5 surgeons, 4 passed assistant surgeons, 4 assistant surgeons, 2 pharmacists, 1 artist, 6 technical assistants, 4 sanitary bacteriologists, 1 organic chemist, 1 sanitary chemist, 1 sanitary engineer, and 34 attendants.

Quarantine inspector.—One quarantine inspector served throughout the entire year.

Acting assistant surgeons.—The services of 24 acting assistant surgeons have been discontinued during the fiscal year, 1 has died, and

33 have been appointed, leaving on duty at the end of the fiscal year 258 such officers. In addition to this number, 76 physicians have been employed locally for the medical relief of superintendents, keepers, and surfmen of the United States Coast Guard.

Medical inspectors.—One female inspector served during the entire year for the inspection of women passengers at Honolulu, Hawaii.

Internes.—At the beginning of the fiscal year there were 19 internes on duty at the various marine hospital stations, 26 were appointed, and 28 were separated from the service by reason of resignation, leaving 17 on duty at the close of the fiscal year.

Pharmacists.—At the beginning of the fiscal year there were on duty 50 pharmacists, divided as follows: Pharmacists of the first class, 28; second class, 16; third class, 6. One pharmacist of the second class resigned, and one pharmacist of the third class was appointed. Two pharmacists of the second class and 2 of the third class were promoted, leaving at the close of the fiscal year 50 pharmacists on duty as follows: Pharmacists of the first class, 30; second class, 15; third class, 5.

Pilots and marine engineers.—At the beginning of the fiscal year there were on duty 16 pilots and 17 engineers; 1 pilot resigned and 2 were appointed; 5 marine engineers resigned and 6 were appointed. The number on duty at the close of the fiscal year was as follows: Pilots, 17; marine engineers, 18.

Hospital and quarantine attendants.—At the beginning of the fiscal year 1,420 attendants were employed at the various marine hospitals, quarantine stations, and on epidemic duty, including 65 such employees on duty in the Philippine Islands, and at the close of the fiscal year there were so employed as follows:

Marine hospitals	561	
Quarantine (including Porto Rico and Hawaii)	270	
Epidemic	288	
Field investigations of public health	75	
		1,194
Philippine Islands		65
Total		1,259

RECAPITULATION.

Commissioned medical officers	212
Chiefs of divisions, Hygienic Laboratory	3
Advisory board, Hygienic Laboratory	5
Artist	1
Technical assistants	6
Quarantine inspector	1
Acting assistant surgeons	258
Medical inspector	1
Collaborating epidemiologists	13
Physicians employed	76
Internes	17
Pharmacists	50
Pilots	17
Marine engineers	18
Chaplain	1
Expert farmer	1
Trained nurses	12
Technical employees, field investigations	93
Attendants	1,259
Total	2,044

BOARDS CONVENED.

Fifty-seven boards were convened at different times and at various stations throughout the United States for the physical examination of officers of the Coast Guard and applicants for entrance therein; 8 for the physical examination of detained aliens; 15 for the examination of commissioned officers to determine their fitness for promotion to the next higher grades of the service; 47 for examination of applicants for appointment as assistant surgeons, and 3 for the examination of pharmacists to determine their fitness for promotion to a higher grade.

The bureau sanitary board has been convened in 16 sessions to pass upon reports of inspections of establishments engaged in the manufacture of vaccines, serums, toxins, etc., prior to recommending a license, and to pass upon advertised remedies and appliances to determine if said advertisements should be excluded from the mails.

One board was convened under paragraph 56 of the service regulations for the physical examination of an officer of the service; 1 board of inquiry and 1 to amend instructions for medical inspection of aliens were convened.

MISCELLANEOUS DIVISION.

PUBLICATIONS.

The publication work of the service continued to increase during the fiscal year 1917. The growth and expansion of the service into new fields of activity was accompanied with increased interest on the part of the public in service work. This growing interest has been felt in the work of this division by reason of increased demand for publications of the service to such an extent that funds for the printing of literature were exhausted before the close of the fiscal year. This made necessary reference to the Public Printer of more requests for sales copies of publications than usual.

During the fiscal year 75 publications of the service were issued, the total editions aggregating 2,891,050 copies, an increase over the fiscal year 1916 of approximately 649,825 copies.

As in previous years, the literature of the service was classifiable into two general divisions. The first class includes those technical publications which are issued as Hygienic Laboratory Bulletins. Because of their character, these bulletins are not distributed to the public generally, but are supplied to libraries, scientists, and others whose especial needs require publications of this nature. However, this special distribution is limited on account of the restriction placed by law on the size of the edition (5,000) and number of bulletins (10) which can be issued in any one year.

In the second class is included the remaining literature of the service. The bulletins of this class are less technical in character and are particularly valuable to public-health officials in combating the introduction and prevalence of disease in their respective localities. The general public is likewise supplied with many documents of this series, popular in style and designed especially for the education of the people in hygiene, sanitation, and individual health, and their relation to national vitality and efficiency. However, this excellent educational work is handicapped by the lack of sufficient funds for printing and clerical force in the bureau.

The following list of service publications issued during the fiscal year 1917 affords a general idea of the scope and character of documents of the various series:

ANNUAL REPORT.

This report records the activities of the service for the year, summarizing its operations in the various fields of work, and making recommendations for the betterment of the service.

HYGIENIC LABORATORY BULLETINS.

This series comprises the technical bulletins of the service previously mentioned. Much aid is given by this series to laboratories and technical workers. The following were published during the fiscal year just ended:

106. **Studies in Pellagra.** I. Tissue Alteration, Malnutrition, and Pellagra. By John Sundwall. II. Cultivation Experiments with the Blood and Spinal Fluid of Pellagrins. By Edwin Francis.
107. **Changes in the Pharmacopœia and National Formulary.** Digest of the changes and requirements included in the Pharmacopœia of the United States, ninth decennial revision, and in the National Formulary, fourth issue, with reference to the titles not continued from the preceding edition. By Martin I. Wilbert.
108. **Experimental Studies with Muscicides and Other Fly-Destroying Agencies.** By Earle B. Phelps and Albert F. Stevenson.
109. I. **Pituitary Standardization.** The relative value of infundibular extracts made from different species of mammals and a comparison of their physiological activity with that of certain commercial preparations. By George B. Roth.
    II. **Pharmacological Studies with Cocaine and Novocaine.** A comparative investigation of these substances in intact animals and on isolated organs. By George B. Roth.

PUBLIC HEALTH BULLETINS.

These bulletins are less technical in character than the preceding series. Many are popular in style and have proved very useful for distribution to the general public in connection with campaigns to improve health in various localities. Practically all of the bulletins of this series are of value to health officers, who frequently find in them the solution of local health problems. The following were issued during the year:

77. **Rural School Sanitation,** including the physical and mental status of school children of Porter County, Ind. By Taliaferro Clark, G. L. Collins, and W. L. Treadway.
78. **Influence of Occupation on Health During Adolescence:** Report of a physical examination of 679 male minors under 18 in the cotton industries of Massachusetts. By M. V. Safford.
79. **Impounded Water:** Surveys in Alabama and South Carolina during 1915 to determine its effect on the prevalence of malaria. By H. R. Carter, J. A. A. Le Prince, and T. D. Griffitts.
80. **Transactions of Special Conference of State and Territorial Health Officers with the United States Public Health Service,** held at Salt Lake City, Utah, February 2 and 3, 1916.
81. **Studies in Vocational Diseases.** The effect of gas-heated appliances upon the air of workshops. By Charles Weisman.
82. **Transactions of the Fourteenth Annual Conference of State and Territorial Health Officers with the United States Public Health Service.** Held in Washington, D. C., May 13 and 15, 1916.
83. **Transactions of a Special Conference of State and Territorial Health Officers with the United States Public Health Service, for the consideration of the prevention of the spread of poliomyelitis.** Held at Washington, August 17 and 18, 1916.
84. **Is Mosquito or Man the Winter Carrier of Malaria Organisms?** By M. Bruin Mitzmain.
85. **Miners' Consumption.** A study of 433 cases of the disease among zinc miners in southwestern Missouri. By A. J. Lanza, with a chapter on Roentgen Ray Findings in Miners' Consumtpion, by Dr. Samuel B. Childs.

PUBLIC HEALTH REPORTS.

These reports are issued each week and in conformity with law are distributed to "health officers," "collectors of customs," and "other sanitarians." The reports of the occurrence and prevalence of disease, together with other public-health statistics, appearing each week in this series, give the health officer definite information of the existence and extent of epidemics of disease and thus materially aid him in protecting the health of his community. During the year the printing of State and municipal laws and ordinances, and court decisions relating thereto, was discontinued to economize in the use of print paper. However, this information is being collected for publication at a later date in another series. The weekly editions during the past year reached a maximum of 13,200 copies.

REPRINTS FROM THE PUBLIC HEALTH REPORTS.

These documents are reprints of the leading articles appearing each week in the Public Health Reports. By reissuing these articles in pamphlet form it is possible to distribute them much more extensively at a comparatively small cost. The scope and value of these reprints become evident from a reading of the following list of those issued during the past fiscal year:

343. **Cyanide Gas for the Destruction of Insects,** with special reference to mosquitoes, fleas, body lice, and bedbugs. By R. H. Creel and F. M. Faget.
344. **State and Insular Health Authorities, 1916.**
345. **The Notifiable Disease.** Reported prevalence during 1915 by States. Dengue, diphtheria, malaria, measles, epidemic cerebrospinal meningitis, poliomyelitis, rabies, Rocky Mountain spotted fever, scarlet fever, septic sore throat, smallpox, tuberculosis, typhoid fever, and typhus fever. Cases reported, indicated case rates per 1,000 population, and indicated fatality rates per 100 cases.
346. **Directory of City Health Officers,** containing the names and official titles of the health officers of cities having a population of over 10,000 in 1910.
347. **The Notifiable Diseases.** Prevalence during 1915 in cities over 100,000. Diphtheria, gonorrhea, malaria, measles, epidemic cerebrospinal meningitis, pellagra, poliomyelitis, rabies in man, rabies in animals, scarlet fever, smallpox, syphilis, tuberculosis, and typhoid fever. Cases reported indicated case rates per 1,000 population and indicated fatality rates per 100 cases.
348. **Public Health Administration in Nebraska.** By Carroll Fox.
349. **Hay Fever and Its Prevention.** By W. Scheppegrell, M. D., president American Hay-Fever Prevention Association, New Orleans, La.
350. **Poliomyelitis (Infantile Paralysis).** What is known of its cause and modes of transmission. By Wade H. Frost.
351. **Artificial Purification of Oysters.** A report of experiments upon the purification of polluted oysters by placing them in water to which calcium hypochlorite has been added. By William Firth Wells.
352. **Health Insurance.** Report of standing committee adopted by the conference of State and Territorial health authorities with the United States Public Health Service, Washington, D. C., May 13, 1916. Committee: William C. Woodward, M. D., health officer of the District of Columbia, and B. S. Warren, surgeon, United States Public Health Service.
353. **Pellagra.** The value of the dietary treatment of the disease. By J. R. Ridlon.
354. **Syphilis.** Some of its public health aspects. By L. L. Williams.
355. **Present-Day Control of Drugs and Medicines.** The variation in purity and strength of widely used drugs and preparations—a vexation to the physician and a menace to the patient. By Martin I. Wilbert.
356. **The Sanitation of Railway Cars.** By Thomas R. Crowder, Chicago.

357. **Diagnosis of Plague in Rats.** The advisability of making routine microscopic examinations of rats supplementary to the macroscopic examination. By C. L. Williams.
358. **Mental Examinations of School Children.** The school as a factor in the mental hygiene of rural communities. By Taliaferro Clark.
359. **Anopheles Infectivity Experiments.** An attempt to determine the number of persons one mosquito can infect with malaria. By M. Bruin Mitzmain.
360. **The Notifiable Diseases.** Prevalence during 1915 in cities of 10,000 to 100,000. Diphtheria, malaria, measles, epidemic cerebrospinal meningitis, pellagra, poliomyelitis, rabies in man, rabies in animals, scarlet fever, smallpox, tuberculosis, and typhoid fever. Cases reported, indicated case rates per 1,000 population, and indicated fatality rates per 100 cases.
361. **Poliomyelitis (Infantile Paralysis).** Its interstate and intrastate control. Minimum requirements for its control. Reports of committees adopted by the special conference of State and Territorial health authorities with the United States Public Health Service, Washington, D. C., August 17 and 18, 1916.
362. **The Sewage Pollution of Streams.** Its relation to the public health. By W. H. Frost.
363. **The Accuracy of Certified Causes of Death.** Its relation to mortality statistics and the International List. Report of a committee of the vital statistics' section of the American Public Health Association.
364. **Municipal Ordinances, Rules, and Regulations Pertaining to Public Health, 1915.**
365. **Public Health Administration in Youngstown, Ohio.** By Carroll Fox.
366. **The Physical Care of Rural School Children.** By Taliaferro Clark.
367. **A Sickness Survey of North Carolina.** By Lee K. Frankel, Ph. D., sixth vice president, and Louis I. Dublin, Ph. D., statistician, Metropolitan Life Insurance Co., New York.
368. **Drinking Water on Interstate Carriers.** A study of conditions on steam vessels engaged in interstate commerce in the sanitary district of the Great Lakes. By J. O. Cobb, C. L. Williams, and H. P. Letton.
369. **Mottled Enamel and Brown Stain.** A condition affecting the teeth in certain localities. By F. C. Smith.
370. **Destroying Lice on Typhus Fever Suspects.** By S. B. Grubbs.
371. **Sanitation in the Philippine Islands.** Work of the sanitary commissions. By J. D. Long.
372. **The new editions of the U. S. P. and the N. F.** A review of the Pharmacopœia of the United States of America, ninth decennial revision, and of the National Formulary, fourth edition. By M. I. Wilbert.
373. **Poliomyelitis (Infantile Paralysis).** Present knowledge of its cause and manner of spread.
374. **Fly Poisons.** Studies on sodium salicylate, a new muscicide, and on the use of formaldehyde. By Earle B. Phelps and Albert F. Stevenson.
375. **Public Health Administration.** City of Birmingham and county of Jefferson, Ala. By Carroll Fox.
376. **The Transmissibility of Pellagra.** Experimental attempt at transmission to the human subject. By Joseph Goldberger.
377. **Mental Status of Rural School Children.** Report of preliminary sanitary survey made in New Castle County, Del., with a description of the tests employed. By E. H. Mullan; also includes:
The Mental Status of Rural School Children of Porter County, Ind. By Taliaferro Clark and W. L. Treadway. Reprinted from Public Health Bulletin No. 77.
378. **Prevalence of Syphilis.** As indicated by the routine use ofthe Wassermann reaction. By Wm. M. Bryan and Jas F. Hooker.
379. **The Feeble-Minded.** Their prevalence and needs in the school population of Arkansas. By Walter L. Treadway.
380. **Relationship of Milk Supplies to Typhoid Fever.** By W. H. Frost.
381. **Case Fatality in Typhoid Fever.** By A. W. Freeman.
382. **Malaria.** A public health and economic problem in the United States. By John W. Trask.
383. **Public Health Administration in Colorado.** By Carroll Fox.
384. **Control of Pollution of Streams.** The International Joint Commission and the Pollution of Boundary Waters. By Earle B. Phelps.

385. **Laundries and the Public Health.** A sanitary study including bacteriologic tests. By M. C. Schroeder and S. G. Southerland, Bureau of Laboratories, Department of Health, New York City.
386. **Commission on Milk Standards.** Third report of the commission on milk standards appointed by the New York Milk Committee.
387. **Climate and Tuberculosis.** The relation of climate to recovery. By John W. Trask.
388. **Municipal Ordinances, Rules, and Regulations Pertaining to Public Health, 1916.**
389. **Interstate Sanitary Districts as Revised February 12, 1917. Interstate Quarantine Regulations.** Amendments promulgated February 12, 1917.
390. **Public Health Administration.** With special reference to towns and rural communities. By Paul Preble.
391. **The Activity of Wild American Digitalis.** By George B. Roth.
392. **A Program of Public Health for Cities.** By W. C. Rucker.
393. **Anopheline Mosquitoes.** Their distribution and infection under field conditions. By M. Bruin Mitzmain.
394. **The Notifiable Diseases.** Prevalence in large cities, 1916.
395. **Typhoid Fever and Municipal Administration.** By A. W. Freeman.
396. **Flight of Mosquitoes.** Studies on the distance of flight of Anopheles quadrimaculatus. By J. A. A. Le Prince and T. H. D. Griffitts.
397. **Drinking Fountains.** Investigation of Fountains at the University of Minnesota. By H. A. Whittaker, Director, Division of Sanitation, Minnesota State Board of Health.
398. **Mental Examination of Immigrants.** Administration and line inspection at Ellis Island. By E. H. Mullan.
401. **Biological Products.** Establishments licensed for the propagation and sale of viruses, serums, toxins, and analogous products.
402. **Morbidity Statistics of Hospitals.** The need for morbidity statistics of general hospitals, special hospitals, sanatoria, etc., and means for their collection and publication. By Edwin W. Kopf, Assistant Statistician, Metropolitan Life Insurance Company, New York.
403. **Poliomyelitis. (Infantile Paralysis.)** Prevalence and geographic distribution during 1916.
404. **Chemical Closets.**

SUPPLEMENTS TO THE PUBLIC HEALTH REPORTS.

These publications are not published in the Public Health Reports, nor distributed as a part thereof. They are popular in style and especially designed for distribution to the general public. Only one supplement was issued during the year, partly due to the lack of funds, but a number of other manuscripts, to be issued in this series, are now in press or being prepared. The following was published during the year:

30. **Common Colds.** By W. C. Rucker.

MISCELLANEOUS PUBLICATIONS.

This series comprises certain documents of the service, such as administrative regulations, lists of reference, etc.

12. **List of Publications, Public Health Service.** July, 1916.
16. **Nomenclature of Diseases and Conditions.** For use of the Public Health Service.

LIBRARY.

The library of the bureau was enlarged materially during the fiscal year by the purchase of many new and valuable works on medicine, hygiene, sanitation, and kindred subjects. A number of volumes were also donated.

The bureau kept acquainted with the progress of the medical sciences through subscriptions to 49 scientific journals.

NEEDS OF THE SERVICE.

National quarantine.—The question of making complete the national quarantine system by the acquisition of the few remaining stations not under Federal control is considered sufficiently important to be classified as one of the most important needs of the Public Health Service. During the fiscal year a resolution was passed by the New York Legislature authorizing the transfer to the Federal Government of the quarantine station of the port of New York, on the condition that reasonable compensation, to be arrived at by competent appraisement, should be paid to the State for the property. The city authorities of Baltimore also passed an ordinance indicating their willingness to turn over to the Government the station at that port at a reasonable rate of reimbursement to the city. These two points are the sole remaining ports of importance where quarantine measures are not under Federal control, and their acquisition awaits only appropriations by Congress for their purchase, as contemplated in the act of February 15, 1893, in the following language:

> That whenever the proper authorities of the State shall surrender to the United States the use of buildings and disinfecting apparatus at a State quarantine station, the Secretary of the Treasury shall be authorized to receive them and to pay a reasonable compensation to the State for their use * * *.

Quarantine procedure at American ports is closely interwoven with other Federal activities, such as customs and immigration, and uniform quarantine methods are necessary in the interest of facilitating commerce, protecting the country as a whole from the introduction of disease, and adjusting international questions involving quarantine practice. In the past, although the United States Government has been signatory to several international sanitary agreements, its representatives have not had control of quarantine procedure at several of the largest and and most important ports. The gradual enlargement of the national quarantine system, however, and the protection afforded all ports through its operation, have demonstrated its practicability and its necessity. Commercial interests have been quick to recognize the advantage of one set of quarantine regulations over numerous requirements at as many ports.

Since the outbreak of the war in Europe, more serious epidemics of typhus fever, smallpox, and cholera have occurred on the Continent than have been recorded. The alteration of established trade channels has resulted in the appearance of rodent plague at several British ports, four or five of them having reported the finding of plague-infected rats during the past fiscal year. The return of troops and the resumption of commerce with European ports after the war may well constitute a serious menace to the health of this country,

to guard against which the control of quarantine procedure at all ports should be in the hands of the Federal Government.

Additional commissioned officers.—A recommendation that appropriations be provided which will permit of an increased number of commissioned medical officers in the Public Health Service is respectfully renewed. The need of additional trained men has at all times been felt in the development of the service during the past few years. The commissioned officers, serving under permanent appointment, enter the service as a life work, and their value to the Government increases with their years of training and experience.

Recent legislation has added materially to the duties which will henceforth constitute a permanent and growing responsibility. Under the immigration act, examination of arriving aliens by two medical officers is specifically required at many places where the work has heretofore been performed by one. This act also requires the physical examination of all alien sailors on vessels arriving at American ports. The hospitals and relief stations of the service have been opened to Government employees suffering injuries in the course of their employment. All seamen who apply for rating as able seamen are now required to pass a physical examination by service officers. Applicants for certain positions in the classified civil service are also given physical examination at the request of the Civil Service Commission. It is believed that the enlargement of the permanent medical corps should keep pace with the increasing activities of the service, and favorable consideration of increased commissioned personnel is earnestly recommended to Congress.

Proposed Sanitary Reserve Corps.—A bill to establish a Sanitary Reserve Corps of the Public Health Service (S. J. Res. 63) was passed by the Senate on June 18, 1917. The text of the measure follows:

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purpose of securing a reserve for duty in the Public Health Service in time of national emergency there shall be organized, under the direction of the Secretary of the Treasury, under such rules and regulations as the President shall prescribe, a reserve of the Public Health Service. The President alone shall be authorized to appoint and commission as officers in the said reserve such citizens as, upon examination prescribed by the President, shall be found physically, mentally, and morally qualified to hold such commissions, and said commissions shall be in force for a period of five years, unless sooner terminated in the discretion of the President, but commission in said reserve shall not exempt the holder from military or naval service. Said officers shall consist of sanitarians, senior assistant sanitarians, and assistant sanitarians, and when ordered to active duty in the service of the United States shall receive the rank, pay, allowances, and leaves of absence of surgeons, passed assistant surgeons, and assistant surgeons, repectively.

SEC. 2. That for the purpose of carrying out the provisions of this act the sum of $300,000 be appropriated out of any money in the United States Treasury not otherwise appropriated.

In the House of Representatives, the joint resolution was referred to the Committee on Interstate and Foreign Commerce, which Committee on August 30, 1917, reported a substitute measure, reading as follows:

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby established a Reserve Corps of the United States Public Health Service to be composed of officers of State, county, and municipal health organizations and other persons skilled in sanitary science.

Sec. 2. That appointments to the Reserve Corps of the United States Public Health Service shall be made by the President upon the recommendation of the Surgeon General of the United States Public Health Service with the approval of the Secretary of the Treasury and commissioned with grade of assistant surgeons, passed assistant surgeons, surgeons, or senior surgeons in the Reserve Corps of the Public Health Service for four years or during the war in which the United States is now engaged in accordance with rules and regulations prescribed by the President: Provided, That no person shall be appointed as a member of the Reserve Corps as aforesaid until his voluntary application for appointment has been filed with the Surgeon General of the United States Public Health Service.

Sec. 3. That said officers when ordered to active duty as members of the Reserve Corps of the United States Public Health Service shall be subject to the orders of the Surgeon General of said service and while so serving shall receive from the United States the same salaries and allowances of officers of the corresponding grade in the Public Health Service: Provided, That officers of State, county, and municipal health organizations shall not be commissioned in said Reserve Corps without the assent of the proper executive officers of their respective States, counties, or municipalities. Officers in the Reserve Corps of the Public Health Service may be promoted successively to the higher grades of the Reserve Corps of the Public Health Service under rules and regulations prescribed by the President.

Sec. 4. That when any person other than a commissioned medical officer of the Public Health Service shall be appointed chief of either the Division of Chemistry, Zoology, or Pharmacology of the Hygienic Laboratory he shall be commissioned by the President as zoologist, chemist, pharmacologist, or assistant pharmacologist, as the case may be, in the Public Health Service. Sanitary engineers, assistant sanitary engineers, epidemiologists, and assistant epidemiologists may, on the recommendation of the Surgeon General, with the approval of the Secretary of the Treasury, be commissioned as such by the President. The respective grades and order of promotion of such officers shall be prescribed by regulations of the Public Health Service.

Sec. 5. That the duties of the Reserve Corps of the United States Public Health Service shall be performed under instructions issued by the Surgeon General of such service, with the approval of the Secretary of the Treasury, and shall be directed toward the proper sanitation of ports and places within the United States or within the jurisdiction of the United States Government, including especially places in and near which industrial forces are or are to be mobilized and places in which military forces are to be mobilized and places near which military forces are mobilized.

Sec. 6. That it shall be the duty of the United States Public Health Service to cooperate with State, county, and municipal health organizations and with officials in charge of industrial establishments, with a view to coordinating the activities and making effective the work of the health organizations of the United States.

The purpose of the proposed legislation is evident from a reading of the text of the two measures. The necessity for an organization of trained sanitarians and health officers whose services could be utilized in the occurrence of epidemics or other emergencies of a public health character is one that has been felt on numerous occasions in the past. This need has been urgent in the work recently undertaken for the sanitation of areas adjacent to military cantonments and industrial establishments—work of vital importance that suddenly confronted the service with the entrance of the United States into the war. As indicated in the measure, the personnel of the reserve would be enrolled, but would receive compensation only when called upon to perform active duty. The resolution as orginally introduced had the endorsement of the bureau, the Treasury Department, and the Council of National Defense, and was strongly urged in resolutions unanimously adopted by the Conference of State and Territorial Health Officers at their meeting held in Washington

last April. It is believed that through the establishment of an organization such as outlined, a strongly organized and efficient force for the protection of the public health could be maintained under the supervision of the Federal Government, at an expense that would be comparatively small, and thoroughly justified by such circumstances as would result in its call to active duty.

Information of disease prevalence.—In estimates submitted to Congress for the fiscal year 1919 request has been made for an appropriation of $25,000 for the purpose of securing better and more complete information of the prevalence of disease in the United States. There is nothing of such fundamental importance in public-health work and disease control as dependable information of the localities where diseases are present, their relative prevalence in such localities, and the conditions under which cases are occurring. At this time the need of such information is especially acute, in order that diseases occurring among the civil population may be prevented from spreading to the military forces.

Publications.—Another need of the service that is at all times present is additional funds for the printing of publications. The increased activities along many lines of public-health work has stimulated the demand for literature on health subjects. There is no other way in which the Federal health agency can be of greater service to the public at large than by the publication and dissemination of information that will enable the individual to intelligently cooperate with the authorities, National, State, and local, who are striving to better health conditions. Although the number of publications distributed during the fiscal year has been larger than in any preceding year, the number of requests which could not be filled has also increased. Because of limited editions it has been necessary to refer many applicants for publications to the Superintendent of Documents, from whom copies could be purchased.

Bureau personnel.—In estimates submitted to Congress request has been made for several additional employees for the bureau. The assistance provided for administrative work has not kept pace with the increased work of the service in the field. The estimates submitted have been held down to what is considered minimum requirements, and it is earnestly hoped that the increase will be allowed.

RUPERT BLUE, *Surgeon General.*

APPENDIX.

Financial Statement.

Receipts and expenditures, Public Health Service, for the fiscal year ended June 30, 1917.

APPROPRIATION: "PUBLIC HEALTH SERVICE, 1917."

Subheads of appropriations.	Appropriations and repayments.	Expenditures.	Balance June 30, 1917.
Pay, etc., commissioned officers and pharmacists	$786,550.00	$697,999.01	$88,550.99
Pay of acting assistant surgeons	200,000.00	191,522.00	8,478.00
Pay of other employees	517,106.00	501,620.28	15,485.72
Freight, transportation, etc	30,000.00	27,885.43	2,114.57
Fuel, light, and water	80,000.00	78,882.21	1,117.79
Furniture, etc	8,000.00	7,992.67	7.33
Purveying depot supplies (appropriation, $51,000)	58,956.20	58,950.36	5.84
Maintenance, Hygienic Laboratory	20,000.00	19,998.91	1.09
Maintenance marine hospitals (appropriation, $276,000)	292,907.29	285,404.54	7,502.75
Care of seamen, etc. (appropriation, $185,000)	193,732.97	188,713.48	5,019.49
Books	500.00	489.01	10.99
Disbursements		[1] 2,033,688.40	
Encumbrances		25,769.50	
Total (appropriation, $2,154,156)	2,187,752.46	2,059,457.90	128,294.56

[1] Includes $1,400 transferred to "Contingent expenses, Treasury Department, stationery, 1917."

NOTE.—For expenditures by stations under marine hospitals and relief, see Statistical Table 2.

APPROPRIATION: "PREVENTING THE SPREAD OF EPIDEMIC DISEASES, 1917."

Amount of appropriation		$400,000.00
Expenditures:		
Disbursements	[1] $382,676.14	
Encumbrances	1,700.25	
As follows—		
Plague eradicative measures—		
Louisiana	201,483.72	
California	58,684.29	
Washington	5,864.43	
Prevention of trachoma—		
Kentucky	25,560.19	
Tennessee	7,155.72	
Virginia	5,146.12	
West Virginia	6,865.66	
Typhus-fever prevention—		
Texas border	54,786.18	
Preventive measures:		
Cuba, South America	7,587.85	
China, Italy	1,940.72	
Travel	1,412.32	
Vaccine	5,590.44	
Telegrams, stationery, etc	2,298.75	
		384,376.39
Balance June 30, 1917		15,623.61

NOTE.—Payments amounting to $78,167.04 were made from pay items of appropriation "Public Health Service, 1917," account of epidemic duty.

[1] Includes $200 transferred to "Contingent expenses, Treasury Department, stationery, 1917."

APPROPRIATION: "QUARANTINE SERVICE, 1917."

Amount of appropriation		$185,000.00
Repayments		2,841.86
Total		187,841.86
Expenditures:		
Disbursements	[1] $179,904.72	
Encumbrances	7,932.63	
		187,837.35
Balance June 30, 1917		4.51

Expenditures by stations.

Name of station.	Pay and allowances, officers and employees.[2]	Maintenance.	Total maintenance, pay, and allowances.
Alaska	$220.00	$240.00	$460.00
Alexandria, Va.	.....	.25	.25
Beaufort, S. C.	750.00	329.74	1,079.74
Biscayne Bay, Fla.	1,548.00	.....	1,548.00
Boca Grande, Fla.	1,725.00	511.72	2,236.72
Boston, Mass.	20,504.39	19,449.36	39,953.75
Brunswick, Ga.	2,220.00	1,434.31	3,654.31
Cape Charles, Va.	10,057.82	8,806.82	18,864.64
Cape Fear, N. C.	4,500.01	3,553.00	8,053.01
Cedar Keys, Fla.	300.00	.....	300.00
Charleston, S. C.	8,765.00	3,194.48	11,959.48
Columbia River, Oreg.	11,867.00	3,871.92	15,738.92
Cumberland Sound, Fla.	3,180.00	72.00	3,252.00
Darien, Ga.	120.00	.....	120.00
Delaware Bay and River	10,094.34	3,939.49	14,033.83
Delaware Breakwater, Del.	3,966.67	1,698.60	5,665.27
Eagle Pass, Tex.	1,975.00	69.85	2,044.85
Eastport, Me.	1,266.66	.....	1,266.66
El Paso, Tex.	.....	50.00	50.00
Eureka, Cal.	346.00	23.85	369.85
Galveston, Tex.	16,071.83	9,248.82	25,320.65
Georgetown, S. C.	255.00	10.00	265.00
Gulf, Miss.	6,260.78	2,271.14	8,531.92
Hawaii	28,351.00	12,668.68	41,019.68
Key West, Fla.	3,679.99	764.84	4,444.83
Laredo, Tex.	2,040.00	429.87	2,469.87
Miscellaneous	.....	1,628.37	1,628.37
Mobile, Ala.	10,244.66	5,786.68	16,031.34
New Orleans, La.	28,293.72	16,200.96	44,494.68
Pascagoula, Miss.	835.00	.....	835.00
Pensacola, Fla.	8,036.15	14,378.83	22,414.98
Perth Amboy, N. J.	1,625.00	1,260.70	2,885.70
Port Harford, Cal.	410.00	.....	410.00
Portland, Me.	8,142.22	1,922.53	10,064.75
Porto Rico	27,770.17	13,362.36	41,132.53
Port Royal, S. C.	300.00	.....	300.00
Port Townsend	15,704.34	6,776.83	22,481.17
Providence, R. I.	8,604.01	3,379.66	11,983.67
Reedy Island, Del.	5,024.00	4,778.31	9,802.31
St. Andrews, Fla.	680.00	295.50	975.50
St. Georges Sound, Fla.	296.67	117.00	413.67
St. Johns River, Fla.	2,180.00	574.27	2,754.27
St. Joseph, Fla.	160.00	146.70	306.70
San Diego, Cal.	7,779.18	3,384.61	11,163.79
San Francisco, Cal.	29,887.52	24,224.19	54,111.71
San Pedro, Cal.	933.50	429.88	1,363.38
Savannah, Ga.	8,494.81	6,264.77	14,759.58
Tampa Bay, Fla.	6,859.83	5,817.03	12,676.86
Leprosy Hospital, Hawaii	14,953.00	4,469.43	19,422.43
Total	327,278.27	187,837.35	515,115.62

[1] Includes $500 transferred to "Contingent expenses, Treasury Department, stationery, 1917."
[2] Paid from pay items appropriation "Public Health Service, 1917."

APPROPRIATION: "FIELD INVESTIGATIONS OF PUBLIC HEALTH, 1917."[1]

Amount of appropriation		$250,000.00
Repayments		117.09
Total		250,117.09
Expenditures:		
Disbursements	[1]$232,615.66	
Encumbrances	5,897.79	
As follows—		
Filariasis	1,339.49	
Industrial hygiene	21,164.55	
Industrial hygiene (health insurance)	1,945.94	
Industrial wastes	18,197.62	
Investigations of navigable waters	35,664.64	
Malaria	19,270.99	
Mine sanitation	423.20	
Pellagra	35,762.63	
Poliomyelitis	13,955.35	
Pollution of coastal waters	27,272.41	
Public health organization and administration	2,345.46	
Rural sanitation	43,399.67	
School hygiene	7,478.25	
Sewage disposal	7,349.33	
Stationery, telegrams, etc	2,943.92	
		$238,513.45
Balance June 30, 1917		11,603.64

NOTE.—Payments amounting to $52,860.64 were made from the appropriation "Pay, etc., commissioned officers and pharmacists, Public Health Service, 1917," on account of field investigations.

APPROPRIATION: "NATIONAL QUARANTINE AND SANITATION."

Balance July 1, 1916		$1,427.97
Expenditures	$0.84	
Transferred to Supervising Architect	616.50	
		617.34
Balance June 30, 1917		810.63

APPROPRIATION: "INTERSTATE QUARANTINE SERVICE, 1917."

Amount of appropriation		$100,000.00
Expenditures:		
Disbursements	$58,738.52	
Encumbrances	27,025.34	
		85,763.86
Balance June 30, 1917		14,236.14

NOTE.—Payments amounting to $17,982.02 were made from appropriation "Pay, etc., commissioned officers and pharmacists, Public Health Service, 1917," on account of interstate quarantine.

APPROPRIATION: "SPECIAL STUDIES OF PELLAGRA, PUBLIC HEALTH SERVICE, 1917."

Amount of appropriation	$40,000.00
Expenditures	[2]27,789.66
Balance June 30, 1917	12,210.34

NOTE.—Payments amounting to $7,027.56 were made from appropriation "Pay, etc., commissioned officers and pharmacists, Public Health Service, 1917," on account of special studies of pellagra.

APPROPRIATION: "STUDIES OF RURAL SANITATION, PUBLIC HEALTH SERVICE, 1917."

Amount of appropriation		$25,000.00
Expenditures:		
Disbursements	$24,871.76	
Encumbrances	113.04	
		24,984.80
Balance June 30, 1917		15.20

NOTE.—Payments amounting to $6,390.54 were made from appropriation, "Pay, etc., commissioned officers and pharmacists, Public Health Service, 1917," on account of studies of rural sanitation.

[1] Includes $800 transferred to "Contingent expenses, Treasury Department, stationery, 1917."

[2] Includes $100 transferred to "Contingent expenses, Treasury Department, stationery, 1917."

APPROPRIATION: "CONTROL OF BIOLOGIC PRODUCTS, PUBLIC HEALTH SERVICE, 1917."

Amount of appropriation		$10,000.00
Expenditures		9,929.86
Balance June 30, 1917		70.14

APPROPRIATION: "RELIEF AND TRANSPORTATION OF AMERICAN CITIZENS IN MEXICO, PUBLIC HEALTH SERVICE."

Balance July 1, 1916		$565.28
Expenditures	$284.54	
Reverted to Treasury Department allotment	280.74	
		565.28

APPROPRIATION: "SALARIES, OFFICE OF SURGEON GENERAL, PUBLIC HEALTH SERVICE, 1917."

Amount of appropriation	$61,550.00
Expenditures	60,998.93
Balance June 30, 1917	551.07

APPROPRIATION: "NATIONAL HOME FOR LEPERS."

Amount of appropriation	$250,000.00
Expenditures	66.48
Balance June 30, 1917	249,933.52

CONSTRUCTION APPROPRIATIONS.

LEPROSY HOSPITAL, HAWAII.

Balance June 30, 1917 (act of Mar. 3, 1905)	$16,956.35

MARINE HOSPITALS.

(Balances June 30, 1917.)

Cleveland, Ohio (act Mar. 4, 1909)	$100.00
Cleveland, Ohio (act Mar. 4, 1907)	374.95
Cleveland, Ohio (act July 26, 1916)	1,000.00
Fort Stanton, N. Mex. (act Aug. 24, 1912)	3.20

QUARANTINE STATIONS.

Columbia River (act July 1, 1916)	5,000.00
Expenditures	735.81
Balance June 30, 1917	4,264.19
New Orleans (act July 1, 1916)	30,200.00
Transferred to Supervising Architect	5,200.00
Balance June 30, 1917	25,000.00

(Balances June 30, 1917.)

Boston (act July 1, 1916)	150,000.00
Brunswick (act June 25, 1910)	1,708.87
Charleston (act Mar. 4, 1909)	634.46
Columbia River (act June 25, 1910)	745.47
Delaware Breakwater (act Mar. 4, 1907)	857.00
Gulf (act Mar. 4, 1907)	353.35
Honolulu (act Sept. 8, 1916)	10,000.00
Honolulu (act Mar. 4, 1907)	390.52
Mobile (act July 1, 1916)	10,000.00
Pensacola (act Mar. 4, 1907)	18.02
Reedy Island (act Mar. 4, 1909)	66.71
San Francisco (act May 27, 1908)	180.75
San Francisco (act June 30, 1906)	1,511.71
Savannah (act Mar. 4, 1909)	410.85

Statistical Tables.

Table 1.—*Comparative table of number of patients annually treated, 1868 to 1917.*

Fiscal year.	Sick and disabled seamen furnished relief.	Fiscal year.	Sick and disabled seamen furnished relief.
Prior to reorganization:		After reorganization—Continued.	
1868	11,535	1893	53,317
1869	11,356	1894	52,803
1870	10,560	1895	52,643
After reorganization:		1896	53,804
1871	14,256	1897	54,477
1872	13,156	1898	52,709
1873	13,529	1899	55,489
1874	14,356	1900	56,355
1875	15,009	1901	58,381
1876	16,808	1902	56,310
1877	15,175	1903	58,573
1878	18,223	1904	58,556
1879	20,922	1905	57,013
1880	24,860	1906	54,363
1881	32,613	1907	55,129
1882	36,184	1908	54,301
1883	40,195	1909	53,704
1884	44,761	1910	51,443
1885	41,714	1911	52,209
1886	43,822	1912	51,078
1887	45,314	1913	50,604
1888	48,203	1914	53,226
1889	49,518	1915	55,782
1890	50,671	1916 [1]	68,398
1891	52,992	1917 [2]	64,022
1892	53,610		

[1] Includes patients treated at trachoma hospitals.
[2] Does not include patients treated at trachoma hospitals.

TABLE 2.—*Transactions at marine hospitals and other relief stations, fiscal year 1917.*

	Total number of patients treated.	Patients in hospital July 1, 1916.	Admitted during the year.	Total number treated in hospital.	Discharged.	Died.	Remaining in hospital June 30, 1917.	Number of days' relief in hospital.	Number of patients furnished office relief.	Number of times office relief was furnished.	Number persons examined physically, including pilots.	Number of foreign seamen treated	Days hospital relief furnished foreign seamen.	Amount expended.
Grand total	**64,033**	**1,173**	**16,818**	**17,991**	**16,218**	**517**	**1,256**	**500,578**	**46,031**	**102,228**	**28,356**	**366**	**8,220**	**$1,008,726.56**
First-class stations.														
Baltimore, Md	2,936	62	719	781	671	38	72	31,968	2,155	3,543	1,428	2	74	44,147.66
Boston, Mass	2,471	61	793	854	779	22	53	26,051	1,617	2,753	1,553	.....	.....	46,008.74
Buffalo, N. Y	2,249	25	444	469	431	18	20	9,240	1,780	3,292	954	.....	.....	21,207.03
Chicago, Ill	1,633	59	713	772	707	20	45	22,334	861	1,209	1,794	1	12	43,699.83
Cleveland, Ohio	2,077	25	486	511	460	22	29	12,753	1,566	2,408	755	1	2	26,230.46
Detroit, Mich	1,237	26	474	500	477	9	14	12,094	737	1,056	1,405	1	10	29,977.56
Evansville, Ind	1,234	12	114	126	118	5	3	3,415	1,108	1,820	28	.....	.....	15,243.97
Fort Stanton, N. Mex	327	197	130	327	66	43	218	77,272	.....	.....	.....	.....	.....	138,648.77
Key West, Fla	475	6	141	147	125	4	18	3,168	328	446	62	6	167	16,315.80
Louisville, Ky	669	11	154	165	148	8	9	4,763	504	1,190	56	.....	.....	12,649.30
Memphis, Tenn	1,465	20	383	403	381	9	13	8,511	1,062	1,549	.....	.....	.....	18,110.38
Mobile, Ala	1,118	20	395	415	384	10	21	9,910	694	908	559	30	719	18,435.50
New Orleans, La	2,858	64	719	783	690	30	63	24,058	2,075	4,361	894	132	3,793	33,475.58
New York, N. Y	5,225	93	1,826	1,919	1,775	50	94	43,509	3,306	5,926	5,702	24	323	69,210.82
Portland, Me	587	25	228	253	232	9	12	6,721	334	543	360	44	935	22,275.93
Port Townsend, Wash	361	56	219	275	221	10	44	18,362	86	224	28	2	28	22,999.28
St. Louis, Mo	976	30	263	293	239	20	34	12,157	683	1,238	95	.....	.....	24,398.97
San Francisco, Cal	5,873	105	1,690	1,795	1,636	45	114	48,474	4,078	9,282	1,361	22	654	63,363.11
Savannah, Ga	1,122	22	384	406	351	11	44	11,158	716	957	761	25	511	18,647.08
Vineyard Haven, Mass	279	11	120	131	118	3	10	5,254	148	214	5	5	50	11,377.94
Total	35,172	930	10,395	11,325	10,009	386	930	391,172	23,836	42,919	17,800	295	7,278	696,423.71
Second, third, and fourth class stations.														
Albany, N. Y	93	.....	20	20	19	1	.....	579	73	146	.....	.....	.....	1,303.60
Ancon and Colon Canal Zone	207	14	193	207	193	1	13	4,961	.....	.....	.....	.....	.....	10,312.50
Apalachicola, Fla	127	2	26	28	28	.....	.....	252	99	279	.....	.....	.....	982.97
Ashland, Wis	177	.....	41	41	38	.....	3	701	136	164	.....	.....	.....	1,718.43
Ashtabula, Ohio	377	.....	38	38	34	1	3	395	339	514	15	.....	.....	1,856.75
Astoria, Oreg	154	.....	36	36	33	1	2	361	118	172	38	.....	.....	1,107.93
Bangor, Me	33	.....	11	11	9	.....	2	109	18	22	74	.....	.....	663.50
Barnstable, Mass	5	.....	.....	.....	.....	.....	.....	.....	5	19	.....	.....	.....	21.50
Bay City, Mich	39	.....	9	9	9	.....	.....	119	30	58	28	.....	.....	336.94
Beaufort, N. C	237	.....	1	1	1	.....	.....	53	236	855	.....	.....	.....	1,144.62
Beaufort, S. C	4	.....	.....	.....	.....	.....	.....	.....	4	4	.....	.....	.....	5.00
Bellingham, Wash	78	.....	10	10	9	.....	1	126	68	262	.....	.....	.....	525.80

Boothbay Harbor, Me	70		16	16	15		1	175	54	146	31			555.15
Bridgeport, Conn	11		11	11	10	1		149						150.00
Brunswick, Ga	79		16	16	16			103	63	75	11	2	11	790.50
Burlington, Iowa	79	1	36	37	37			484	42	56				846.75
Cairo, Ill	618	3	104	107	104	1	2	1,345	511	701	12			6,388.55
Cambridge, Md	41	1	32	33	30		3	662	8	8				927.00
Cedar Keys, Fla	13								13	13				54.60
Charleston, S. C	590	1	88	89	85	2	2	1,498	501	777	130	1	6	6,815.68
Chattanooga, Tenn	10		10	10	10			148						335.25
Cincinnati, Ohio	104	1	27	28	23	4	1	316	76	121	42			1,014.78
Cordova, Alaska	63		10	10	8		2	190	53	73				1,425.90
Crisfield, Md	79	2	7	9	9			104	70	108	4			439.95
Delaware Breakwater, Del	163	1	7	8	6	2		56	155	189	30	1	14	
Duluth, Minn	542		38	38	33		5	510	504	539	307			1,352.50
Eastport, Me	56								56	69				56.90
Edenton, N. C	24		1	1	1			4	24	50				141.50
Elizabeth City, N. C	166		2	2	2			32	164	267	196	1	7	594.00
Ellsworth, Me														12.00
Erie, Pa	217		47	47	45		2	920	170	245	32			1,201.50
Escanaba, Mich	44		9	9	9			57	35	35	2			394.00
Eureka, Cal	46		10	10	10			81	36	36				505.00
Fernandina, Fla	8								8	16	2			300.00
Gallipolis, Ohio	170	2	50	52	48	1	3	1,022	118	216	26			1,955.25
Galveston, Tex	1,584	19	487	506	486	2	18	6,674	1,078	1,589	365			16,001.58
Georgetown, S. C	237		24	24	22		2	247	213	249				1,049.00
Gloucester, Mass	210	1	28	29	24	5		363	181	363	33			1,163.24
Grand Haven, Mich	75	1	19	20	20			190	55	115	102			670.80
Green Bay, Wis	65		9	9	8	1		80	56	75	16			434.10
Gulfport, Miss	97		5	5	4	1		60	92	167	17			564.53
Hancock, Mich	4		2	2	2			41	2	3				263.40
Hartford, Conn	9	2	7	9	9			425			9			422.69
Honolulu, Hawaii	580	12	184	196	181	3	12	4,336	384	891	273	32	573	7,398.50
Hoquiam, Wash	75		21	21	21			473	54	121	24			1,556.15
Irvington, Va	24		1	1	1			15	23	28				328.00
Jacksonville, Fla	324	1	75	76	73	2	1	937	248	292	227			3,145.43
Juneau, Alaska	159	2	47	49	43	3	3	1,023	110	293				3,151.00
Kansas City, Mo	55	3	13	16	16			186	39	50	20			693.36
Ketchikan, Alaska	143	1	22	23	21		2	208	120	169	6			1,433.00
La Crosse, Wis	31		5	5	4		1	63	26	34	16			428.00
Little Rock, Ark	26		10	10	10			102	16	20	2			342.00
Los Angeles, Cal	631	6	209	215	198	4	13	3,822	416	570	127	2	25	14,674.61
Ludington, Mich	121		27	27	25	2		298	94	206	43			1,070.95
Machias, Me	53		12	12	12			193	41	73	30			595.45
Manistee, Mich	40		11	11	9	1	1	237	29	48	50			732.24
Manitowoc, Wis	168	2	74	76	73	1	2	903	92	178	21			1,655.00
Marquette, Mich	66		7	7	7			179	59	62	53	2	88	649.00
Marshfield, Oreg	33		14	14	13		1	258	19	27				894.05
Menominee, Mich	25		5	5	4	1		80	20	32	4			457.75
Milwaukee, Wis	694	6	80	86	78	6	2	1,442	608	991	574			8,621.69
Nantucket, Mass											11			379.29
Nashville, Tenn	42		4	4	4			36	38	134	16			401.35
Natchez, Miss	97		2	2	2			32	95	298	1			332.00

TABLE 2.—*Transactions at marine hospitals and other relief stations, fiscal year 1917*—Continued.

	Total number of patients treated.	Patients in hospital July 1, 1916.	Admitted during the year.	Total number treated in hospital.	Discharged.	Died.	Remaining in hospital June 30, 1917.	Number of days' relief in hospital.	Number of patients furnished office relief.	Number of times office relief was furnished.	Number persons examined physically, including pilots.	Number of foreign seamen treated	Days hospital relief furnished foreign seamen.	Amount expended.
Second, third, and fourth class stations—Continued.														
New Bedford, Mass	103	1	20	21	17	1	3	244	82	119	41			$739.35
Newbern, N. C	190		77	77	72	2	3	720	113	183	49			1,997.00
New Haven, Conn	31	3	12	15	14	1		185	16	19	80			647.77
New London, Conn	96	3	22	25	22		3	332	71	76	93			1,889.87
Newport, Ark	116		6	6	6			49	110	159				582.36
Newport, Oreg	35		1	1	1			5	34	118				362.14
Newport, R. I	141	1	54	55	51	2	2	718	86	119	6			1,316.00
Newport News, Va														300.00
Nome, Alaska	2								2	4				8.75
Norfolk, Va	5,012	29	1,025	1,054	966	22	66	15,079	3,958	6,951	1,468	9	108	32,981.07
Ogdensburg, N. Y	74		14	14	13	1		131	60	212	1			499.50
Oswego, N. Y	9		8	8	8			118	1	1				680.48
Paducah, Ky	90	1	11	12	10	2		124	78	142	23			570.40
Pensacola, Fla	360	3	84	87	81	4	2	1,098	273	939	211			2,061.85
Perth Amboy, N. J	92	2	15	17	15	2		246	75	111	2			416.34
Philadelphia, Pa	1,425	1	270	271	247	6	18	3,187	1,154	1,906	1,396			16,455.88
Pittsburgh, Pa	398	5	149	154	145	4	5	2,934	244	361	72			14,067.57
Ponce, P. R	34	2	5	7	7			165	27	81				193.00
Port Angeles, Wash	176		1	1	1			4	175	229				212.16
Port Arthur, Tex	300	2	56	58	57	1		463	242	750	48			900.20
Port Huron, Mich	87		4	4	4			42	83	278	154			322.50
Portland, Oreg	732	8	131	139	125	2	12	4,155	593	967	493	2	5	10,537.47
Portsmouth, N. H	18		1	1	1			14	17	24	34			54.50
Providence, R. I	376	4	131	135	123	5	7	2,210	241	343	314			4,320.48
Provincetown, Mass	62		10	10	10			62	52	161	41			477.48
Reedville, Va														248.35
Richmond, Va	30		10	10	9	1		161	20	32	5			601.16
Rockland, Me	225								225	360	23			499.25
St. Elizabeth's Hospital, Washington, D. C	77	53	24	77	10	5	62	20,135						12,963.93
St. Paul, Minn	5								5	19				26.55
Saginaw, Mich	55	1		1	1			38	54	91	18			348.65
Salem, Mass	1								1	1				1.00
San Diego, Cal	240	17	172	189	177	3	9	2,131	51	86	5	13	84	6,632.50
Sandusky, Ohio	44		6	6	5		1	146	38	48	28			346.25
San Juan, P. R	834	7	121	128	122	4	2	3,037	706	785	160			2,555.35

Sault Ste Marie, Mich	312	2	129	131	118	3	10	1,701	181	261	51	1	4	2,737.38
Seattle, Wash	1,958	6	347	353	345	6	2	3,311	1,605	3,943	1,762	3	7	16,420.97
Seward, Alaska	56		12	12	12			176	44	51				1,193.35
Sheboygan, Wis	16		6	6	6			208	10	20	9			612.85
Solomons, Md	226		6	6	6			43	220	272				548.11
Superior, Wis	203	3	54	57	55		2	970	146	177				1,880.49
Tacoma, Wash	139		16	16	15	1		117	123	194	167	2	10	1,170.80
Tampa, Fla	100		67	67	64		3	1,102	33	40	70			2,897.25
Toledo, Ohio	377	3	112	115	109	4	2	1,512	262	727	284			2,677.00
Unalaska, Alaska	17		9	9	9			138	8	8				545.00
Valdez, Alaska	11		1	1	1			4	10	10				616.10
Vicksburg, Miss	172	1	68	69	68	1		623	103	225	17			1,728.04
Washington, D. C	150		45	45	41		4	431	105	166	39			2,452.49
Washington, N. C	91		9	9	8		1	129	82	117	5			813.75
Wilmington, N. C	139		44	44	39	1	4	479	95	139	22			2,921.93
Total	25,699	242	5,675	5,917	5,460	131	326	107,292	19,908	55,338	10,211	71	942	271,777.03
Relief furnished other than noted above:														
Coast Guard cutter Androscoggin	555	1	16	17	17			89	538	1,077				22,533.20
Other Coast Guard vessels	422								422	1,051	36			
Keepers and surfmen, United States Coast Guard [1]	1,834		732	732	732			2,025	1,102	1,492	267			17,992.62
Quarantine stations	351								224	351	42			
Total	3,162	1	748	749	749			2,114	2,286	3,971	345			40,525.82

[1] Treatment furnished by private physicians and a visit to a patient is counted as a day's treatment in hospital.

Total expenditures for first-class stations	$696,423.71
Total expenditures for second, third, and fourth class stations	271,777.03
Washington, D. C.:	
Bureau	55,354.85
Hygienic Laboratory	165,497.43
Purveying depot	67,062.89
Coast Guard cutters and other duty	40,525.82
Immigration	225,675.61
Railroad transportation, freight charges, etc	18,947.49
Miscellaneous	28,487.00
Total expenditures	1,569,751.83

NOTE.—In some cases the full pay of an officer may be included in the cost of operation of a relief station, though not devoting his entire time to that work, being also engaged on work under other branches of the service.

TABLE 3.—*Summary of physical examinations made by officers of the United States Public Health Service during the fiscal year ended June 30, 1917, exclusive of immigrants.*

Summary of examinations and rejections.	Total.	Pilots.	Merchant seamen.	Coast Guard Service.	Post Office Department.	Coast and Geodetic Survey.	Lighthouse Service.	Foreign seamen.	Immigration Service.	Civil Service Commission.	Panama Canal.	Philippine Islands.	Alaskan Engineering Commission.	Public Health Service.	United States Navy.	United States Army.	Bureau of Education.
Total number examined	28,356	5,989	11,373	3,198	242	235	104	2,805	1,760	1,942	1	12	670	6	14	1	4
Number passed	24,747	5,864	10,148	1,968	232	218	90	2,566	1,317	1,730	1	12	576	6	14	1	4
Number rejected	3,609	125	1,225	1,230	10	17	14	239	443	212	.....	.....	94	.....	.....	.....	.....
Causes of rejections.																	
Abdominal scar due to operation	18	.....	1	17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Abnormal temperature	3	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Abnormal temperature and pulse	2	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Abnormal temperature and bronchitis	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Abscess of teeth	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Abscess of jaw	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Abscess of toes and poor physique	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Acne	6	.....	.....	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Adenoids	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alcoholism	32	.....	9	22	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
Albuminuria	67	.....	2	63	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....
Albuminuria and varix vein of leg	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Albuminuria and curvature of spine	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Albuminuria and shreds in urine	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Albuminuria and hernia, inguinal	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Amputation of toes and defective hearing	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aneurysm of aorta and valvular disease of heart	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aneurysm of artery	2	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Anemia and poor physique	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ankylosis of finger	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ankylosis of elbow	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
Ankylosis of shoulder	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arterial sclerosis	6	.....	2	2	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....
Arrhythmia of heart	4	.....	1	1	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....
Artificial foot	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Artificial eye and defective vision	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aphasia	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Atrophy of muscle of arm	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Atrophy of muscle of leg	2	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Blepharitis	1			1													
Blind in one eye	22		15					3	1				3				
Bronchitis, chronic	1			1													
Bronchitis and phimosis	1		1														
Burn of forearm	1			1													
Burn of face, neck, and ears	1							1									
Cataract of eye	1	1															
Cataract of eye and defective vision	1							1									
Caput medusæ	1			1													
Caries of teeth	4			4													
Casts in urine	1			1													
Chancroid of penis	25		10	6						8				1			
Cleft palate, complete	1		1														
Congestion of lung	1		1														
Consolidation of lungs	1		1														
Conjunctivitis, chronic	4			4													
Contusion of toes	1			1													
Contusion of arm	1		1														
Contracture of chest and curvature of spine	1			1													
Curvature of spine	2		1			1											
Defective color sense	457	55	296	47		4	1	50		4							
Defective hearing	35		19	13			1			1			1				
Defective hearing and underweight	1			1													
Defective hearing and hernia	1		1														
Defective hearing and bronchitis	1		1														
Defective hearing and teeth	1		1														
Defective vision	964	63	482	203	6	3	4	112		90			1				
Defective and missing teeth	162		18	136		1							7				
Defective vision and hearing	3		1	1						1							
Defective vision and flat feet	5			3			1			1							
Defective vision and psoriasis	1		1														
Defective vision and shreds in urine	1			1													
Defective vision and color sense	6	1	5														
Defective vision and syphilis	1		1														
Defective vision and necrosis of teeth	1		1														
Defective vision and varix	1									1							
Defective vision and overweight	1			1													
Defective speech	1		1														
Defective teeth and phimosis	1		1														
Deformity of foot	1		1														
Deformity of thumb and cleft palate	1			1													
Deformity of hand	1												1				
Deformity of chest	1			1													
Deformity of ear	2			2													
Deformity of arm	1			1													
Deformity of face	1			1													
Deformity of nose	1			1													
Deficient teeth	1												1				
Deficient chest expansion	2			2													
Deflected nasal septum	2			2													
Dental plate	6			6													
Diabetes mellitus	5			4			1										
Diabetes insipidus	1			1													

TABLE 3.—*Summary of physical examinations made by officers of the United States Public Health Service during the fiscal year ended June 30, 1917, exclusive of immigrants*—Continued.

Summary of examinations and rejections.	Total.	Pilots.	Merchant seamen.	Coast Guard Service.	Post Office Department.	Coast and Geodetic Survey.	Lighthouse Service.	Foreign seamen.	Immigration Service.	Civil Service Commission.	Panama Canal.	Philippine Islands.	Alaskan Engineering Commission.	Public Health Service.	United States Navy.	United States Army.	Bureau of Education.
Causes of rejections—Continued.																	
Diarrhea, acute	1		1														
Diphtheria, suspected	1		1														
Disease of lung (unclassified)	2			2													
Diseased tonsils	1			1													
Displacement of ocular lens	1			1													
Eczema	6		1	4									1				
Eczema and sore throat	1			1													
Ectropion	1			1													
Emaciated and poor physique	1								1								
Enlarged thyroid glands	1			1													
Enlarged epitrochlear glands	1			1													
Enlarged tonsils	22		1	20						1							
Enlarged heart and albuminuria	1			1													
Enlarged glands (unclassified)	1			1													
Enlarged inguinal glands	3			3													
Enlarged lymph glands	2			2													
Enlarged heart	1		1														
Epididymitis, acute	1							1									
Epididymitis, chronic	1			1													
Epithelioma of lip	1		1														
Excessive fat	1			1													
Feeble-minded	3			3													
Favus	1			1													
Fever (unclassified)	4		1	2						1							
Flat feet	13		2	10						1							
Flat feet and varix of vein	7		2	2						2			1				
Flat feet and hammertoe	1			1													
Fracture of arm, old	1			1													
Fracture of tibia, old	1		1														
Fracture of ulna	1	1															
Fracture of ankle, old	1		1														
Fistula in ano	2			2													
Fibre-lipoma, sacral region	1		1														

Fraudulent impersonation	1		1													
General debility and defective vision	1									1						
Glucosuria	1			1												
Gonorrhea	96		30	24				9	32				1			
Gonorrhea adenitis	1		1													
Gonorrhea and phimosis	2		2													
Heart disease (unclassified)	20		2	18												
Hernia, inguinal	153	1	88	10			2	20	16	14			2			
Hernia, umbilical	15		10	3						2						
Hernia, ventral	5		4	1												
Hernia, unclassified	62		28	5	2			5		6			16			
Hernia, incomplete	1			1												
Hernia, inguinal, and dental plate	1						1									
Hernia and defective vision	1							1								
Hernia and ingrowing toenails	1			1												
Hernia, inguinal, and asthma	1								1							
Hemorrhoids, external	2			2												
Hemorrhoids (unclassified)	8			4						1			3			
Hemorrhoids, mixed, and dental plate	1		1													
Hydrocele of tunica vaginalis	15		9	3				2					1			
Hydrocele and varicocele	3		2							1						
Hypertrophy of heart	13			12						1						
Hammertoe	5			5												
High blood pressure	7			7												
Herpes zoster	1			1												
History of convulsions	1			1												
History of insanity on family	1			1												
Hypertrophied turbinates	2		2													
Hypertrophy of tonsils	3			3												
Hypertrophic rhinitis	2			2												
Idiocy	1								1							
Injury of toes	1			1												
Injury of hand	1									1						
Influenza	5		1	4												
Infected bunion	1			1												
Inguinal adenitis	2								2							
Inflammation of tonsils	1			1												
Inflammation of lymph glands, groin	1		1													
Inflammation of eyelids, chronic and gonorrhea	1		1													
Inflammation of middle ear, supperative	11		5	6												
Incomplete examination	16	1	2	13												
Impetigo contagiosa	1			1												
Irregular heart action	2			1						1						
Laryngitis, chronic	1			1												
Loss of eye	1								1							
Loss of fingers	5		2	3												
Loss of thumb	1			1												
Locomotor ataxia	3			3												
Low blood pressure	1			1												
Lymphadenitis, acute, inguinal	6		2	2					1	1						
Lymphadenitis and gonorrhea	1			1												
Marked baldness	1			1												
Mentally deficient	12			12												

TABLE 3.—*Summary of physical examinations made by officers of the United States Public Health Service during the fiscal year ended June 30, 1917, exclusive of immigrants*—Continued.

Summary of examinations and rejections.	Total.	Pilots.	Merchant seamen.	Coast Guard Service.	Post Office Department.	Coast and Geodetic Survey.	Lighthouse Service.	Foreign seamen.	Immigration Service.	Civil Service Commission.	Panama Canal.	Philippine Islands.	Alaskan Engineering Commission.	Public Health Service.	United States Navy.	United States Army.	Bureau of Education.
Causes of rejections—Continued.																	
Measles	1									1							
Mitral insufficiency	1			1													
Mouth breather	2			2													
Myocarditis	4			2					2								
Myositis, lumbar	1		1														
Nasal catarrh	1			1													
Nasal obstruction	4			4													
Necrosis middle ear	1			1													
Nervousness	1												1				
Nephritis, chronic interstitial	3			3													
Neurotic heart	1			1													
Neurasthenia and defective vision	1												1				
Obesity	1			1													
Orchitis and hydrocele	1					1											
Ostemoyelitis	1												1				
Osteoma of tibia	1									1							
Overweight	3			3													
Overweight and weak heart	1		1														
Perforation of membrana tympani	1			1													
Permanent baldness	1			1													
Pharyngitis, chronic	1			1													
Pharyngitis, acute	4		1	3													
Phimosis	2			2													
Pleurisy, chronic	1		1														
Poor physique	38		1	16						13			8				
Poor physique and valvular disease of the heart, cardiac	1												1				
Poor physique and defective teeth	1												1				
Poor physique and varix of vein	2												2				
Poor physique and weak heart	1												1				
Practically blind in both eyes	1		1														
Psoriasis	2		1	1													
Ptosis of eyelid	2			2													

Pulmonary stenosis	1			1													
Pus in urine	2			2													
Pyorrhea alveolaris	8			8													
Rapid heart action	3			3													
Râles over lungs	3			3													
Refused examination	10		3	7													
Refused vaccination	1			1													
Rheumatism, muscular	1		1														
Rhinitis, atrophic	1			1													
Ringworm	3		2	1													
Scabies	13		8	3						1				1			
Senility	2		1								1						
Senility and defective vision	1		1														
Sclerosis of ears	1		1														
Shortened leg, due to old fracture	1													1			
Shortened leg and curvature of spine	2			1										1			
Shortened leg	2		1					1									
Shreds in urine	39			39													
Shreds in urine and albuminuria	1			1													
Skin disease, chronic	2			1				1									
Sprain of back	1							1									
Spinal curvature and flat feet	1					1											
Spinal curvature and fracture of ribs	1			1													
Stuttering	1			1													
Stiff knee	1		1														
Stricture of urethra	2			2													
Stiff hand	1		1														
Soft chancre	4		2							2							
Syphilis	54		17	13		2		4		17	1						
Syphilis of skin	3		2					1									
Syphilis of mouth	4		1					1		2							
Syphilis and flat feet	1		1														
Systolic murmur	3		1	2													
Systolic murmur and albuminuria	1			1													
Synovitis of knee	1		1														
Tachycardia	1			1													
Tenosynovitis and hammer toe	1			1													
Tinea versicolor	1													1			
Tobacco heart and varix of vein	1		1														
Tonsillitis, syphilitic	1			1													
Trachoma	2							1		1							
Tumor of bone of leg	1			1													
Tumor of tonsil	1										1						
Tuberculosis of lungs	22		3	4	1					7	5			2			
Ulcer of leg	2		1								1						
Ulcer of foot	2		1	1													
Underweight	152		1	148							3						
Underweight and defective vision	1		1														
Underweight and poor physique	3			3													
Underweight and varix of legs	1			1													
Underweight and scabies	1			1													
Underheight	15			15													

TABLE 3.—*Summary of physical examinations made by officers of the United States Public Health Service during the fiscal year ended June 30, 1917, exclusive of immigrants*—Continued.

Summary of examinations and rejections.	Total.	Pilots.	Merchant seamen.	Coast Guard Service.	Post Office Department.	Coast and Geodetic Survey.	Lighthouse Service.	Foreign seamen.	Immigration Service.	Civil Service Commission.	Panama Canal.	Philippine Islands.	Alaskan Engineering Commission.	Public Health Service.	United States Navy.	United States Army.	Bureau of Education.
Causes of rejections—Continued.																	
Underheight and overweight	1			1													
Undescended testicle	5			5													
Urinary fistula and defective vision	1									1							
Unable to read or write any language	2							2									
Valvular disease of heart, cardiac, mitral	34		8	14		1	2	3	1	4			1				
Valvular disease of heart, cardiac, aortic	8		1	4		1		1		1							
Valvular disease of heart, mitral and aortic	1		1														
Valvular disease of heart, cardiac (unclassified)	38		12	12		1	1			10			2				
Varicose ulcers	1			1													
Varicose veins, leg	16		2	8									6				
Varicose veins (unclassified)	26		7	8				1		4			6				
Varicose veins and ulcer of leg	1		1														
Varicose veins and necrosis of teeth	1									1							
Varicose veins and hydrocele	1									1							
Varicose veins and mitral regurgitation	1		1														
Varicose veins and scabies	1												1				
Varicose veins and hernia	1		1														
Varicose veins and varicocele	2									1			1				
Varicose veins and underweight	1			1													
Varicose veins, leg, and underweight	1			1													
Varicocele	36		5	14	1	1		4		4			7				
Varicocele and defective teeth	2												2				
Varicocele and hernia	1			1													
Varicocele and hammer toe	1			1													
Varicocele and flat feet	1		1														
Varicocele and bronchitis	1		1														
Varicocele and pharyngitis, chronic	1		1														
Venereal warts	1							1									
Venereal disease (unclassified)	5		2					2					1				
Weak abdominal wall, due to operation	5			5													
Web fingers, bilated	1		1														
Weight-lifting test	11									11							

Wound of hand, infected	1							1									
Wound of finger, infected	1		1														
Wound of leg, operation	1		1														
Wound of groin, operation	1		1														
Wound of knee	1									1							

TABLE 4.—*Tabular statement of diseases and injuries treated during the fiscal year ended June 30, 1917.*

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Abscess about rectum	52	.....	36	21	11	.....	1	3	16
Abscess about urethra	9	.....	2	1	1	.....	.....	.....	7
Adscess, alveolar	104	.....	25	11	11	2	.....	1	79
Abscess in male perineum	10	.....	2	1	.....	.....	.....	1	8
Abscess of:									
Axilla	39	.....	8	4	3	1	.....	.....	31
Abdominal wall	1	.....	1	1	.....	.....	.....	.....	.....
Arm	51	.....	14	12	2	.....	.....	.....	37
Ankle	3	.....	2	2	.....	.....	.....	.....	1
Brain	1	.....	1	.....	.....	.....	1	.....	.....
Back	14	1	1	.....	1	1	.....	.....	12
Buttock	3	.....	3	2	1	.....	.....	.....	.....
Bone	4	.....	.....	.....	.....	.....	.....	.....	4
Barthelin's gland	2	.....	.....	.....	.....	.....	.....	.....	2
Cowper's gland	1	.....	.....	.....	.....	.....	.....	.....	1
Eye and annexa	10	.....	4	3	1	.....	.....	.....	6
Elbow	3	.....	1	1	.....	.....	.....	.....	2
Epididymis	1	.....	.....	.....	.....	.....	.....	.....	1
Face	18	.....	5	3	2	.....	.....	.....	13
Finger	31	.....	4	1	3	.....	.....	.....	27
Foot	18	.....	7	4	3	.....	.....	.....	11
Hand	100	1	28	21	5	1	.....	2	71
Hip	2	.....	2	1	.....	.....	1	.....	.....
Ischio-rectal	2	.....	2	.....	2	.....	.....	.....	.....
Jaw	10	.....	2	2	.....	.....	.....	.....	8
Kidney	1	.....	1	1	.....	.....	.....	.....	.....
Knee	10	.....	6	6	.....	.....	.....	.....	4
Leg	14	1	7	4	3	.....	.....	.....	6
Liver	2	.....	2	1	.....	.....	1	.....	.....
Lip	3	.....	2	2	.....	.....	.....	.....	1
Larynx	1	.....	.....	.....	.....	.....	.....	.....	1
Lung	6	1	2	1	2	.....	.....	.....	3
Lymph nodes	41	2	25	19	5	1	1	1	14
Mammary gland	3	.....	1	1	.....	.....	.....	.....	2
Muscle	28	.....	14	5	8	.....	1	.....	14
Nasal septum	4	.....	.....	.....	.....	.....	.....	.....	4
Neck	20	1	5	4	2	.....	.....	.....	14
Palmar	12	.....	2	1	1	.....	.....	.....	10
Parotid region	1	.....	1	.....	1	.....	.....	.....	.....
Perineum	2	.....	2	1	.....	.....	.....	1	.....
Perinephritic	3	.....	3	1	1	.....	.....	1	.....
Peritonsillar	4	.....	4	3	1	.....	.....	.....	.....
Perirectal	1	.....	1	1	.....	.....	.....	.....	.....
Pharynx	5	.....	3	3	.....	.....	.....	.....	2
Prostate gland	3	.....	2	2	.....	.....	.....	.....	1
Salivary gland or duct	1	.....	1	.....	1	.....	.....	.....	.....
Scrotum	11	.....	6	5	1	.....	.....	.....	5
Shoulder	3	.....	1	.....	1	.....	.....	.....	2
Subphrenic	1	.....	1	.....	.....	.....	.....	1	.....
Submammary	1	.....	.....	.....	.....	.....	.....	.....	1
Testicle	1	.....	1	1	.....	.....	.....	.....	.....
Tendon sheath	16	.....	5	5	.....	.....	.....	.....	11
Thigh	6	.....	3	1	2	.....	.....	.....	3
Thyroid gland	1	.....	1	1	.....	.....	.....	.....	.....
Thumb	3	.....	2	1	1	.....	.....	.....	1
Toe	6	1	2	1	2	.....	.....	.....	3
Tonsillar	44	.....	28	26	2	.....	.....	.....	16
Unclassified	250	2	53	31	22	1	.....	1	195
Acne	107	.....	5	2	3	.....	.....	.....	102
Acidosis, nondiabetic	2	.....	.....	.....	.....	.....	.....	.....	2
Achylia gastrica	2	.....	1	.....	1	.....	.....	.....	1
Acromegaly	1	.....	1	.....	.....	.....	.....	1	.....
Actinomycosis	2	.....	2	.....	1	.....	.....	1	.....
Adenoids	8	.....	4	1	.....	3	.....	.....	4
Adherent pericardium	2	.....	1	.....	1	.....	.....	.....	1
Adhesions about gall bladder	2	.....	1	.....	1	.....	.....	.....	1
Adhesions of peritoneum	11	.....	7	1	5	.....	.....	1	4
Adhesions, unclassified	9	1	2	.....	2	1	.....	.....	6
Adenoma	4	.....	.....	.....	.....	.....	.....	.....	4
Adiposis dolorosa	3	.....	1	.....	1	.....	.....	.....	2
Albuminuria	19	.....	2	1	1	.....	.....	.....	17
Alopecia	1	.....	.....	.....	.....	.....	.....	.....	1

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Alopecia areata	2								2
Amaurosis	2		1		1				1
Amblyopia	9		1			1			8
Amaebiasis	5		4		3		1		1
Amputation of stump	10	1	3	2		1		1	6
Amygdalitis, acute, follicular	688	5	233	184	45	5	1	3	450
Amygdalitis, chronic, follicular	97		60	53	12	3	1	1	37
Amenorrhea	1								1
Amygdalolith	1								1
Anemia, pernicious	9		8		4		3	1	1
Anemia, simple	128		10	1	8	1			118
Anemia, splenic	1		1					1	
Aneurysm of artery	17	1	15	2	4	4	2	4	1
Angina ludovici	3		2	2					1
Angina pectoris	13		8		4	1	1	2	5
Ankylosis of joint	7	1	3		2	1		1	3
Anti-inoculation, typhoid and smallpox	1,250								1,250
Anemia of brain	1								1
Aneurysm of heart	1								1
Angioma	4								4
Angiospatic edema	2								2
Aortitis	1		1				1		
Aphasia	2	1	1	1				1	
Appendicitis, acute	208	11	156	129	10	2	5	21	41
Appendicitis, chronic	108	4	53	39	10	2	1	5	51
Arterial sclerosis, cerebral	5	1	2		1			1	2
Arterial sclerosis, general	118	3	43		29	3	7	7	72
Arthritis, acute	78		27	6	20	1			51
Arthritis, chronic	33	1	11	1	9	1		1	21
Arthritis, deformans	16	8	6		3	2		9	2
Asthma	157	2	59	10	46			5	96
Astigmatism	18		3		3				15
Atrophy of liver, acute, yellow	1		1					1	
Atrophy of testicle	1								1
Antony of stomach	31		4	4					27
Antony of muscle	4	1	1		1	1			2
Atrophy of optic nerve	5	1	2			1		2	2
Autointoxication, intestinal	293	1	85	70	14	1		1	207
Bacteriuria	1								1
Balanoposthitis	57		4	2	2				53
Beriberi	9	3	2	2	3				4
Blastomycosis	2	1	1	1	1				
Blepharitis	9								9
Bromidrosis	5	1		1					4
Bronchiectasis	6		5		4	1			1
Bradycardia	2								2
Bronchitis, acute	2,178	4	235	172	61	5		1	1,939
Bronchitis, chronic	304	7	94	21	63	9	4	4	203
Bursitis, acute	54	1	17	8	10				36
Bursitis, chronic	33		13	7	3			3	20
Calculus in bladder	14		8	1	6	1			6
Calculus in ureter, impacted	9		5	2	2	1			4
Calculus in urethra, impacted	1								1
Calculus of pancreas	1								1
Callositas	9								9
Cardiospasm	4								4
Carbuncle of:									
Arm	14		3		3				11
Back	11		4	3	1				7
Buttock	4		1	1					3
Chest	1		1	1					
Face	3		1		1				2
Forearm	6		1	1					5
Leg	6		4	2	2				2
Lip	4		1	1					3
Neck	82	1	29	22	8				52
Jaw	1		1	1					
Scalp	1		1			1			
Unclassified	51		2	1	1				49
Carcinoma of:									
Abdominal wall	2		1	1					1
Bladder	4	1	2			3			1
Cervical lymph glands	1		1					1	

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Carcinoma—Continued.									
Caecum	1		1			1			
Face	3	1					1		2
Intestines	1		1			1			
Liver	6		5				4	1	1
Lip	2		1			1			1
Neck	2		2			1	1		
Oesophagus	1		1		1				
Stomach	26	2	18		1	9	9	1	6
Sigmoid flexure	1		1		1				
Side	1		1			1			
Soft palate	1		1				1		
Tongue	3		3			2	1		
Thigh	1		1			1			
Unclassified	22	1	7	2		1	3	1	14
Caries of bone	7		5		3			2	2
Caries of teeth	110		6	1	5				104
Cataract	29	1	14	2	8	3		2	14
Cellulitis of:									
Arm	51		6	5				1	45
Elbow	5		5	3	2				
Chest	1		1	1					
Face	27		8	6	2				19
Foot	21		7	3	2	1		1	14
Finger	19		4	2	2				15
Forearm	4		2	2					2
Hand	100	1	34	27	7			1	65
Knee	6		4	3	1				2
Leg, neck, and arm	3		3	3					
Leg	80		14	10	2			2	66
Neck	18		3		3				15
Perineum	3		2		1		1		1
Pelvis	1		1		1				
Thumb	10		1		1				9
Thigh	1		1		1				
Toe	5		2	2					3
Unclassified	73		15	11	2			2	58
Cerebrospinal fever	3		3	1			1	1	
Cerumen, accumulation of	139		2	2					137
Cestodiasis, unclassified	1								1
Chalazion	16		1		1				15
Chancroid	81		7	1	4			2	74
Chancroid of penis	1,774	26	438	217	212	9		26	1,310
Chancroid of vulva	1								1
Cholasma	3								3
Cholangitis, chronic	1								1
Chicken pox	7	1	5	6					1
Chilblain	15	1	5	5	1				9
Chylocele, nonfilarial	1								1
Chyluria, nonfilarial	1								1
Cholangitis, acute	16		10	4	3	1		2	6
Cholecystitis, acute	32		16	10	4		2		16
Cholecystitis, chronic	10		6	1	2	1	1	1	4
Cholelithiasis	22	1	11	7	2	1	2		10
Chorea	4		3		1	1	1		1
Choroiditis	2		1					1	1
Cicatrical contraction of skin	2		1	1					1
Cicatrix of skin	3		2	2					1
Cirrhosis of liver, atrophic	15		11		6	1	2	2	4
Cirrhosis of liver, hypertrophic	26	1	18		7	4	8		7
Clavus	30		4	4					26
Colitis, acute	35		14	10	3			1	21
Colitis, chronic	9		4	1	3				5
Color blindness	7								7
Comedo	5								5
Congestion of lung, acute	12		5	5					7
Congestion of kidney	1								1
Conjunctivitis, acute	372		24	11	10	2		1	348
Conjunctivitis, chronic	41		4		3	1			37
Conjunctivitis, phlyctenular	6								6
Contraction of muscle	7								7
Constipation	1,337	3	75	45	23	5		5	1,259
Cramp of muscle	28		8	5	3				20
Cribbing (pneumophagia)	1								1
Cretinism	1		1				1		

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Curvature of spine	4		1	1					3
Cyst, retention	117	1	27	21	6	1			89
Cyst, unclassified	31		8	6	2				23
Cystitis, acute	156	4	24	12	14			2	128
Cystitis, chronic	109	4	24	6	15	3	2	2	81
Darcyocystitis	13		7	3	3	1			6
Deafness	14	1	2		3				11
Deformity of nose, acquired	1		1		1				
Deformity of penis	1		1					1	
Deformity, unclassified	2		2		2				
Dementia, paralytica	1		1			1			
Dementia, cause unknown	7		5		1	4			2
Dementia precox	41	26	15	8	2	2	2	27	
Dementia precox, catatonia	2		2			2			
Dementia precox, paranoid form	9	5	3		1	2	1	4	1
Dementia, traumatic	1		1					1	
Dementia, arteriosclerotic	4	2	2				2	2	
Dementia post apoplectic	2	2						2	
Degeneration of posterior column of spinal cord	1	1						1	
Dengue	5		2	2					3
Dermatitis exfoliation	6		1		1				5
Dermatitis venenata	29		5	5					24
Dermatitis traumatic	10		2		2				8
Dermatitis herpetiformis	13		2	1	1				11
Dermatitis, unclassified	50		6	3	3				44
Deviation of nasal septum	63		20	13	3	4			43
Dentition	1								1
Degeneration of muscle	2								2
Depression undifferentiated	2	2		1				1	
Diabetes mellitus	120	1	30	2	20	1	4	4	89
Diabetes insipidus	11								11
Diarrhea, flagellate	148		33	24	7	2			115
Dilatation, acute, cardiac	4								4
Dilatation, chronic, cardiac	8	1	5		5			1	2
Dilatation of stomach, acute	3		1		1				2
Dilatation of stomach, chronic	2	1				1			1
Diphtheria	23		21	15	2		2	2	2
Displacement of uterus, puerperium	2		1			1			1
Duodentitis	35		1	1					34
Dupuytren's contraction	4								4
Dysentery, amoebic	43	1	16	8	6	1	1	1	26
Dysentery, bacillary	17	1	4	5					12
Dysentery, unclassified	83	1	25	16	6	3		1	57
Ecthyma	2		1	1					1
Eczema	475		28	7	21				447
Eczema, seborrhoicum	3		1		1				2
Edema of lung	1		1				1		
Elongation of uvula	7								7
Embolism	3		2				2		1
Embolism of coronary artery	2								2
Emphysema, pulmonary, interlobular	1		1		1				
Endocarditis, acute	15	1	8	1	2		4	2	6
Endocarditis, chronic	7		4		3	1			3
Endometritis, chronic	1		1	1					
Endothelioma of parotid region	2		2	1				1	
Enlargement of prostate gland	32	2	11	2	8	1	2		19
Enteritis, acute	294	4	67	53	15	1		2	223
Enteritis, chronic	26		6	4	2				20
Enterocolitis	76		9	6	3				67
Enuresis, functional	2		2			2			
Endemic meat poisoning	1		1	1					
Entropion	2								2
Epididymitis, acute	59	1	25	18	8				33
Epididymitis, chronic	17		6		6				11
Epilepsy	43	2	22		19	3		2	19
Epilepsy, Jacksonian	1								1
Epistaxia	14		5	4	1				9
Epiglottiditis	1								1

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Epithelioma of:									
Cheek and lip	1		1		1				
Face	5		2		1	1			3
Eyelid	4		2		2				2
Lip	14		5	3	1	1			9
Lip and face	2		2	1				1	
Nose	3		1	1					2
Unclassified	11	2	6	2	3	1		2	3
Erythema nodosum	1								1
Esophagitis	1								1
Extravasation of urine	1								1
Erysipelas	49		36	32	2	1		1	13
Erythema multiforme	12		4	3		1			8
Erythema simplex	27		1	1					26
Exophthalmic goiter	2		2			2			
Fatty heart	3								3
Fermentation, gastric	66		3	2	1				63
Fermentation, intestinal	12	1		1					11
Fever of unknown cause	20		12	7	4	1			8
Fibroma	11		5	3	1			1	6
Fissure of anus	15		2	1	1				13
Fissure of skin	2								2
Fistula, fecal	2		2		1		1		
Fistula, perirectal	1		1	1					
Fistula in ano	98	2	52	29	19	4	1	1	44
Fistula of kidney	1	1			1				
Fistula of urethra	13	1	7	4	3	1			5
Fistula of bladder	1		1					1	
Fistula, recto-urethral	4		4	1	3				
Fistula, unclassified	2								2
Functional derangement of liver	204		8	2	5		1		196
Furunculosis	769		81	53	21	4		3	688
Gangrene	7	1	5	2	3	1			1
Gangrene of lung	1		1			1			
Gastritis, acute, catarrhal	566	6	112	84	31	2	1		448
Gastritis, chronic, catarrhal	262	4	53	15	33	3	1	5	205
Gastritis, acute, phlegmonous	45		8	3	5				37
Gastroduodenitis	24		9	6	2			1	15
Gastroenteritis	134	1	35	27	7		1	1	98
Gastroptosis	4		3	1		1		1	1
German measles	10		8	8					2
General paralysis of the insane	21	8	10	3				15	3
Gingivitis	19		1	1					18
Genu recurvatum	1								1
Glaucoma, acute	3		1			1			2
Glaucoma, chronic	2		2		2				
Glossitis, acute	16	1	1	1	1				14
Glossitis, chronic	13								13
Goiter	6								6
Gonecystitis, acute	4		1	1					3
Gonecystitis, chronic	1		1		1				
Gonococcus infection of:									
Bladder	44		7		7				37
Cowper's gland	1								1
Epididymis	266	5	170	93	75	1		6	91
Eye	8		5	3		1		1	3
Joint	184	5	90	21	58	4		12	89
Fallopian tube	1								1
Lymph nodes	147	2	74	30	38	2		6	71
Penis	1,104	8	66	18	54	1		1	1,030
Prostate gland	46	1	23	3	14	4		3	22
Spermatic cord	2		2		2				
Seminal vesicle	87		2		2				85
Testicle	110		40	13	26			1	70
Urethra	4,487	27	573	173	3[illegible]	17		27	3,887
Ureter	24								24
Vagina	1								1
Gout, acute	3								3
Gout, chronic	2		2		2				
Hallux, valgus	16		5	2	1			2	11
Hammertoe	8		5	3	2				3
Hay fever	5		1	1					4
Headache	65	2	6	4	2	2			57
Hematoma, unclassified	5		2	2					3

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Hematuria, renal	12	1	4	.....	3	2	.....	.....	7
Heart block	2	.....	.....	.....	.....	.....	.....	.....	2
Hemophelia	6	.....	1	.....	1	.....	.....	.....	5
Hemoptysis	7	.....	3	.....	3	.....	.....	.....	4
Hemorrhage from rectum	3	.....	2	1	1	.....	.....	.....	1
Hemorrhage into cerebrum	52	7	31	3	8	3	11	13	14
Hemorrhage, subdural	1	1	.....	.....	1	.....	.....	.....	.....
Hemorrhage, intestinal	1	.....	.....	.....	.....	.....	.....	.....	1
Hemorrhage under conjunctiva	1	.....	.....	.....	.....	.....	.....	.....	1
Hemorrhage, urethral	1	.....	1	1	.....	.....	.....	.....	.....
Hemorrhage, unclassified	3	.....	.....	.....	.....	.....	.....	.....	3
Hemorrhoids, external	189	1	32	21	9	3	.....	.....	156
Hemorrhoids, internal	82	1	39	22	10	6	.....	2	42
Hemorrhoids, mixed	97	1	48	36	9	1	.....	3	48
Hernia, femoral	11	.....	7	5	1	1	.....	.....	4
Hernia, inguinal	787	24	358	304	31	30	.....	17	405
Hernia, inguinal, strangulated	14	1	12	13	.....	.....	.....	.....	1
Hernia, epigastric	1	.....	.....	.....	.....	.....	.....	.....	1
Hernia of muscle	1	.....	.....	.....	.....	.....	.....	.....	1
Hernia, umbilical	6	.....	3	.....	2	.....	1	.....	3
Hernia, umbilical, strangulated	1	.....	1	.....	1	.....	.....	.....	.....
Hernia, ventral	15	.....	8	7	1	.....	.....	.....	7
Hernia, unclassified	6	.....	5	4	1	.....	.....	.....	1
Herpes	105	.....	2	.....	2	.....	.....	.....	103
Hiccough	8	.....	.....	.....	.....	.....	.....	.....	8
Hodgkin's disease	3	1	1	.....	1	.....	.....	1	1
Hordeolum	51	.....	1	1	.....	.....	.....	.....	51
Hydrocele of round ligament	1	.....	.....	.....	.....	.....	.....	.....	1
Hydrocele of spermatic cord	13	.....	7	4	3	.....	.....	.....	6
Hydrocele of tunica vaginalis	99	.....	50	36	12	.....	.....	2	49
Hydronephrosis	4	.....	3	1	1	.....	1	.....	1
Hyperchlorhydria	50	.....	7	6	1	.....	.....	.....	43
Hyperchlia gastrica	6	.....	.....	.....	.....	.....	.....	.....	6
Hypermetrophia	6	.....	2	.....	1	1	.....	.....	4
Hypertrophy of bone	13	.....	3	1	2	.....	.....	.....	10
Hypertrophy of heart	1	.....	1	.....	1	.....	.....	.....	.....
Hypertrophy of lymph nodes	4	.....	1	1	.....	.....	.....	.....	3
Hypertrophy of tonsil	59	1	34	32	2	1	.....	.....	24
Hyperidrosis	3	.....	1	.....	1	.....	.....	.....	2
Hypochondriasis	36	.....	8	4	4	.....	.....	.....	28
Hysteria	8	.....	5	3	1	1	.....	.....	3
Ichthyosis	2	.....	.....	.....	.....	.....	.....	.....	2
Impacted feces	7	.....	6	6	.....	.....	.....	.....	1
Impetigo contagiosa	11	.....	6	4	2	.....	.....	.....	5
Impetigo herpetiformis	2	.....	1	1	.....	.....	.....	.....	1
Impetigo simplex	10	.....	1	1	.....	.....	.....	.....	9
Impotence	16	.....	.....	.....	.....	.....	.....	.....	16
Incontinence of urine	23	.....	4	1	2	1	.....	.....	19
Inflammation of salivary gland or duct	4	.....	2	1	1	.....	.....	.....	2
Inflammation of spermatic cord	5	2	2	2	2	.....	.....	.....	1
Influenza	1,455	3	341	275	60	5	1	2	1,112
Infantilism	1	.....	.....	.....	.....	.....	.....	.....	1
Ingrowing nail	38	.....	13	8	3	.....	.....	2	25
Insanity, variety not ascertained	16	1	8	.....	2	7	.....	.....	7
Insomnia	15	.....	1	.....	.....	1	.....	.....	14
Intertrigo	1	.....	.....	.....	.....	.....	.....	.....	1
Iriodocyclitis	3	.....	3	2	1	.....	.....	.....	.....
Iritis	43	.....	16	8	7	1	.....	.....	27
Jaundice, acute infective	49	1	15	12	3	.....	.....	1	33
Keratitis	19	.....	6	5	1	.....	.....	.....	13
Keratitis, phlyctenular	1	.....	.....	.....	.....	.....	.....	.....	1
Keratoiritis	1	.....	.....	.....	.....	.....	.....	.....	1
Keratosis	1	.....	.....	.....	.....	.....	.....	.....	1
Laceration of cervix uteri, old	1	.....	1	.....	.....	.....	.....	1	.....
Laryngitis, acute	153	.....	28	19	8	.....	1	.....	125
Laryngitis, chronic	22	.....	2	.....	2	.....	.....	.....	20
Lichen planus	1	.....	.....	.....	.....	.....	.....	.....	1
Lipoma of:									
Back	1	.....	1	1	.....	.....	.....	.....	.....
Lip	1	.....	1	.....	.....	.....	.....	1	.....
Scalp	1	.....	1	1	.....	.....	.....	.....	.....
Shoulder	1	.....	1	1	.....	.....	.....	.....	.....
Unclassified	11	.....	4	4	.....	.....	.....	.....	7

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Disease and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Loose body in joint	1								1
Lukemia	2		2		2				
Lupus erythematosus	5		3		2			1	2
Lymphadenitis, acute, inguinal	1,027	21	292	135	141	11		26	714
Lymphadenitis, chronic, inguinal	52	1	13	4	7	2		1	38
Lymphingitis	34		10	8	2				24
Malaria, estivo-autumnal	382	4	220	138	81	1	1	3	158
Malaria, quartan	86		29	17	12				57
Malaria, tertian	1,420	9	503	375	121	3	2	11	908
Malformation of:									
Lower jaw	1		1		1				
Nails	2		1		1				1
Nose	2								2
Penis	2		2		1			1	
Salivary gland or duct	1		1		1				
Testicle	4		3	2	1				1
Uvula	1								1
Malingering	60		27	8	2	17			33
Malnutrition	38								38
Mastoiditis, acute	10		9	4	4		1		1
Mastoiditis, chronic	17	1	5		4	1	1		11
Mastitis, acute	4								4
Masturbation	1		1			1			
Measles	276	3	237	212	12	6		10	36
Melancholia, involutional	13	5	7	1	3	2		6	1
Meningitis, cerebral	2		2		1		1		
Meningitis, cerebrospinal	6		6	3			1	2	
Meniere's disease	2								2
Metritis, chronic	2								2
Migrane	35								35
Miliaria	12		1	1					11
Miliary fever	1								1
Mumps	141		116	107	2			7	25
Myelitis, disseminated	1	1					1		
Myelitis, transverse	3		2		2				1
Myocarditis, acute	7	3	2		4	1			2
Myocarditis, chronic	68		29		17	3	5	4	39
Myopia	9		1		1				8
Myositis, acute	47		8	5	2			1	39
Myositis, chronic	5		2		1	1			3
Myositis, traumatic, ossifying	4		1		1				3
Myringitis, acute	1		1	1					
Myxoma of nose	1	1		1					
Myxedema	5		1		1				4
Necrosis of bone	34	7	18	7	11	3	1	3	9
Necrosis of cartilage	1								1
Nephritis, acute	87	2	31	8	15	6	3	1	54
Nephritis, chronic, interstitial	197	7	112	8	78	4	18	11	78
Nephritis, chronic, parenchymatous	84	6	57	2	38	5	11	7	21
Nephrolithiasis	11		7	1	5	1			4
Nephroptosis	2								2
Nervous dyspepsia	42	1	2	1		1		1	39
Neuralgia of:									
Facial nerve	31		3		3				28
Intercostal nerve	77	1	6	3	4				70
Cranial nerve, fifth	22		1		1				21
Median nerve	5		1			1			4
Sciatic nerve	28	1	6	3	4				21
Supraorbital nerve	9		2	1	1				7
Trifacial nerve	20		1	1					19
Unclassified	120	3	18	11	8			2	99
Neurasthenia	295		49	13	30	5		1	246
Neuritis, multiple	62	1	21	10	11			1	40
Neuritis of:									
Anterior tibial nerve	1		1		1				
Anterior and posterior tibial nerve	1		1	1					
Brachial plexus	16	1	2		2	1			13
Median nerve	5		1		1				4
Leg and arm	4		4	3	1				
Intercostal nerve	20		2	1				1	18
Musculo-cutaneous nerve	4		3		3				1
Popliteal nerve	2		1		1				1

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Neuritis of—Continued.									
Pudic nerve	1		1			1			
Sciatic nerve	62	7	33	14	20	3		3	22
Ulna nerve	6		2	1				1	4
Cervical, fifth	6		1	1					5
Unclassified	58								58
Neuritis, optic	2		1	1					1
Neurosis, intestinal	37		10	7	3				27
Neurosis, occupational	5		3		3				2
Neurosis, traumatic	5		2		1	1			3
Neurosis of bladder	6								6
Neuroma	1								1
Nevus	3		1		1				2
Obesity	5		1	1					4
Obstruction, acute, intestinal	4		3		2		1		1
Obstruction, chronic, intestinal	5	1	2	2	1				2
Onychia	28		2	1	1				26
Onychauxis	1								1
Oophoritis, chronic	2								2
Opacity of cornea	2								2
Opacity of vitreous humor	2								2
Orchitis, acute	58		21	12	7	2			37
Orchitis, chronic	22		4	2	2				18
Osteoarthropathy, hypertrophic	3	1	1		1			1	1
Osteitis deformans	6								6
Osteomyelitis, acute	10		6	1	4		1		4
Osteomyelitis, chronic	11		5	1	3	1			6
Osteoma	9	1	5	3		3			3
Otitis externa	52	1	7	4	4				44
Otitis interna, chronic	5		2		2				3
Otitis media, acute	133		25	7	17			1	108
Otitis media, chronic	107	2	23	3	17	1		4	82
Oxyuriasis	3		2	1		1			1
Palpitation, cardiac	4		1	1					3
Papilloma	50		4	1	3				46
Pancreatitis, chronic	1		1					1	
Panophthalmitis	2		1			1			1
Paralysis, acute, ascending	2		2	1	1				
Paralysis, agitans	6		2			1		1	4
Paralysis, Brown-Sequard's	1		1			1			
Paralysis, infantile spastic	1	1						1	
Paralysis of muscle, ischemic	3		2		1			1	1
Paralysis of nerve	26		12	2	9	1			14
Paralysis of ocular muscle	3		2	1	1				1
Paralysis of spinal nerve	1		1		1				
Paranoid	1	1						1	
Paramyoclonus, multiplex	2		1		1				1
Paraphimosis	31		18	13	4			1	13
Paraplegia, ataxia	2	1	1					2	
Paraplegia, hereditary spastic	4	1	3		2		1	1	
Paronychia	19		7	4	3				12
Pellagra	8	1	5		4		1	1	2
Pericarditis	8		8		5	2		1	
Periositis, acute	58	1	20	9	10	2			37
Periostitis, chronic	10		4		2	1		1	6
Pes planus	38	1	10	1	6	1		3	27
Pemphigus	2								2
Perichondritis of auricle	2								2
Perichondritis	1								1
Perversion of appetite	11								11
Pharyngitis, acute	421		37	28	7	1		1	384
Pharyngitis, chronic	79		5		4	1			74
Phimosis, acquired	123	2	45	33	10	3		1	76
Phimosis, congenital	68	2	51	36	14	2		1	15
Phimosis, unclassified	15		15	13	2				
Phlebitis of:									
Femoral vein	2		2	2					
Long saphenous vein	8		8	3	4	1			
Posterior tibial vein	1		1		1				
Right basilic vein	1		1		1				
Unclassified	3		3		3				
Pityriasis rosea	3		1	1					2
Pityriasis simplex	2								2

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Pityriasis versicolor	16	.....	1	.....	1	.....	.....	.....	15
Pleurisy, acute, fibrinous	174	3	75	50	20	.....	3	5	96
Pleurisy, chronic, fibrinous	39	1	15	1	13	.....	.....	2	23
Pleurisy, serofibrinous	45	2	27	11	15	.....	1	2	16
Pleurisy, suppurative	10	.....	7	2	3	.....	.....	2	3
Pleuritic adhesions	10	.....	3	1	2	.....	.....	.....	7
Pneumonia, broncho	36	1	33	24	4	1	4	1	2
Pneumonia, interstitial	3	1	2	2	.....	.....	1	.....	.....
Pneumonia, lobar	206	7	186	124	17	1	42	9	13
Poliomyelitis, anterior, acute	4	.....	4	2	.....	.....	2	.....	.....
Polypus, nasal	27	.....	11	6	4	.....	.....	1	16
Prepuce, redundant	45	.....	31	27	2	1	.....	1	14
Proctitis	8	.....	2	1	1	.....	.....	.....	6
Prolapse of rectum	3	.....	2	1	1	.....	.....	.....	1
Presbyopia	3	.....	.....	.....	.....	.....	.....	.....	3
Prolapse of urethra	3	.....	.....	.....	.....	.....	.....	.....	3
Proctatitis, acute	11	.....	4	2	.....	1	.....	1	7
Proctatitis, chronic	52	1	6	1	5	1	.....	.....	45
Prurigro	4	.....	1	.....	1	.....	.....	.....	3
Pruritus ani	26	.....	1	1	.....	.....	.....	.....	25
Pruritus	13	.....	.....	.....	.....	.....	.....	.....	13
Psoriasis	65	.....	14	3	10	.....	.....	1	51
Psychosthenia	7	.....	3	.....	2	.....	.....	1	4
Psychosis, exhaustive, infective, and toxic	3	.....	2	.....	1	1	.....	.....	1
Psychosis, intoxication	97	2	49	31	13	4	.....	3	46
Psychosis, maniac depressive	17	12	5	.....	4	.....	.....	13	.....
Psychosis, senile	4	.....	4	.....	2	.....	1	1	.....
Psychosis, epileptic	1	1	.....	.....	.....	.....	.....	1	.....
Psychosis, hysterical	3	.....	.....	.....	.....	.....	.....	.....	3
Psychosis, unclassified	6	2	4	1	.....	.....	.....	5	.....
Pterygium	22	.....	8	4	.....	2	.....	2	14
Purpura	4	1	1	1	1	.....	.....	.....	2
Pyelitis	14	1	7	3	5	.....	.....	.....	6
Pyelonephritis	1	.....	1	1	.....	.....	.....	.....	.....
Pylorospasm	2	.....	.....	.....	.....	.....	.....	.....	2
Pyloric incontinence	1	.....	.....	.....	.....	.....	.....	.....	1
Pyopneumothorax	2	.....	1	.....	1	.....	.....	.....	1
Pyorrhea alveolaris	31	.....	5	1	3	.....	.....	1	26
Rabies	1	.....	1	.....	.....	.....	1	.....	.....
Retention of urine	7	.....	3	1	2	.....	.....	.....	4
Retinitis	4	1	1	.....	1	1	.....	.....	2
Rheumatic fever, acute	236	11	153	104	44	2	1	13	72
Rheumatic fever, subacute	83	1	50	32	15	1	.....	3	32
Rheumatism, chronic articular	505	12	132	51	72	5	.....	16	361
Rheumatism, muscular	2,092	10	266	138	116	6	2	14	1,816
Rhinitis, acute	378	.....	14	8	5	1	.....	.....	364
Rhinitis, atrophic	30	.....	1	.....	1	.....	.....	.....	29
Rhinitis, hypertrophic	74	1	13	5	8	1	.....	.....	60
Rhinoscleroma	2	.....	.....	.....	.....	.....	.....	.....	2
Salphingitis, acute	1	.....	.....	.....	.....	.....	.....	.....	1
Salphingitis, chronic	1	.....	1	.....	.....	1	.....	.....	.....
Sarcoma	5	.....	3	2	.....	1	.....	.....	2
Scabies, Norwegian	62	.....	4	2	2	.....	.....	.....	58
Scabies, sarcoptic	231	.....	35	27	7	1	.....	.....	196
Scarlet fever	19	.....	19	17	1	.....	.....	1	.....
Sclerosis, amyotropic, lateral	3	.....	1	.....	1	.....	.....	.....	2
Sclerosis, disseminated	4	.....	1	.....	.....	1	.....	.....	3
Sclerosis, lateral	6	2	2	.....	.....	2	.....	2	2
Sclerosis, unclassified	1	.....	.....	.....	.....	.....	.....	.....	1
Scleritis	2	.....	.....	.....	.....	.....	.....	.....	2
Seasickness	16	.....	1	1	.....	.....	.....	.....	15
Seborrhea	5	.....	.....	.....	.....	.....	.....	.....	5
Seminal emissions	8	.....	.....	.....	.....	.....	.....	.....	8
Senility	29	3	13	3	6	4	.....	3	13
Septicemia	25	.....	6	3	2	.....	.....	1	19
Septicemia, puerperium	1	.....	1	1	.....	.....	.....	.....	.....
Shock	1	.....	1	.....	.....	.....	1	.....	.....
Sinusitis, frontal	25	1	14	6	8	1	.....	.....	10
Sinusitis, maxillary	3	.....	.....	.....	.....	.....	.....	.....	3
Sinus, unclassified	8	.....	6	2	3	.....	.....	1	2
Skin donor	1	.....	1	.....	1	.....	.....	.....	.....
Smallpox	26	.....	16	10	.....	3	.....	3	10

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Somnambulism	1								1
Splanchnoptosis	3		3	1	1	1			
Sprue (psilosis)	1		1		1				
Spermatocele	1								1
Spermatorrhea	9								9
Spur of nasal septum	3								3
Stomatitis	41	1	4	4	1				36
Stomatitis, gangrenous	1								1
Stricture of intestine	1	1		1					
Stricture of uterine canal	1								1
Stricture of rectum	2		2		2				
Stricture of urethra	248	1	72	15	52	3		3	175
Staphyloma of cornea	1		1		1				
Synovitis, acute	64	2	24	16	7		1	2	38
Synovitis, chronic	25	1	12	2	8	1		2	12
Syphilis of—									
Anus	11		4		4				7
Blood vessels	5		3		2		1		2
Bone	34		13		13				21
Brain	28		19		11	4	3	1	9
Cerebral meninges	3	1	1		2				1
Cerebrospinal meninges	6		4		2		1	1	2
Cerebral	1	1					1		
Epididymis	2		2		2				
Eye and annexa	45	2	28	4	23			3	15
Heart	6		5		3		1	1	1
Joint	18		13		12			1	5
Larynx	17		8	1	6	1			9
Liver	2		1		1				1
Lip	5		5		3	1		1	
Lung	1		1		1				
Lymph nodes	100		40	1	38			1	60
Mouth	100	2	34		34	1	1		64
Muscle	1		1		1				
Nasal passage	11	1	6		6			1	4
Palate	9		5		5				4
Pancreas	2		2		2				
Penis	404	7	183	12	161	2		15	214
Pharynx	67		12		11			1	55
Rectum	2		2		2				1
Scrotum	3		3	1	2				
Skin	1,215	11	345	8	325	8		15	859
Spinal cord	37	2	24		21		2	3	11
Spinal nerve	7		3		3				4
Stomach	5		3		2	1			2
Tongue	30		6	1	4			1	24
Tonsil	58	1	42	2	40			1	15
Testicle	11	1	5	1	5				5
Uvula	3		1		1				2
Urethra	2								2
Unclassified	3,528	23	901	24	860	22	2	16	2,604
Syringomyelia	1	1						1	
Tabes dorsalis	106	26	40		27	9		30	40
Tachycardia	30	1	5		5			1	24
Taeniasis	40	1	17	13	4	1			22
Tenosynovitis	20		3	3					17
Teratoma of back	1		1					1	
Teratoma	1								1
Tetanus	1								1
Thyroiditis, acute	1		1		1				
Thyroiditis, chronic	2								2
Thrombosis of middle cerebral artery	2		2		1			1	
Thrombosis of eye and annexa	1								1
Tracheitis	7		1	1					6
Trachoma	7	1	2	2	1				4
Trichophytosis	94		9	5	3	1			85
Tic, convulsive	1								1
Torsion of spermatic cord	1								1
Toxemia of pregnancy	1								1
Trichiasis	1								1

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Tuberculosis:									
Abdominal	3	.....	1	.....	1	.....	.....	.....	2
Acute broncho-pneumonic	4	.....	2	.....	.....	2	.....	.....	2
Acute general	5	.....	4	.....	2	.....	2	.....	1
Acute pneumonic	18	.....	13	.....	8	1	2	2	5
Acute pulmonary miliary	41	1	9	.....	3	4	3	.....	31
Chronic pulmonary	1,044	299	641	4	435	62	146	293	104
Tuberculosis of—									
Bladder	3	.....	2	.....	.....	2	.....	.....	1
Bone	10	2	5	.....	4	.....	.....	3	3
Bronchus	1	.....	1	.....	.....	1	.....	.....	.....
Epididymis	5	1	3	3	.....	.....	.....	1	1
Eye and annexa	1	.....	1	.....	1	.....	.....	.....	.....
Intestines	1	.....	1	.....	.....	.....	1	.....	.....
Joint	18	2	13	.....	10	2	.....	3	3
Kidney	2	.....	2	1	1	.....	.....	.....	.....
Larynx	6	.....	4	.....	.....	4	.....	.....	2
Lymph nodes	23	3	13	4	10	1	.....	1	7
Peritoneum	3	.....	3	.....	2	.....	.....	1	.....
Pharynx	1	.....	1	.....	1	.....	.....	.....	.....
Pleura	1	.....	1	.....	.....	1	.....	.....	.....
Skin	9	.....	5	1	3	.....	1	.....	4
Tendon sheath	1	1	.....	.....	1	.....	.....	.....	.....
Testicle	8	.....	4	1	3	.....	.....	.....	4
Unclassified	5	1	2	1	.....	1	1	.....	2
Tuberculous abscess of vertebra	1	1	.....	.....	.....	.....	.....	1	.....
Tuberculous abscess, unclassified	2	.....	1	.....	1	.....	.....	.....	1
Tumor, mixed, benign	29	2	7	2	3	3	1	.....	20
Tumor, mixed, malignant	4	1	2	.....	.....	.....	2	1	1
Typhoid fever	269	19	226	189	21	.....	22	13	24
Typhoid bacillus carrier	1	1	.....	.....	.....	.....	.....	1	.....
Typhus fever	1	.....	1	1	.....	.....	.....	.....	.....
Ulcer of—									
Coronea	16	.....	9	2	5	.....	.....	2	7
Duodenum	11	.....	3	.....	2	1	.....	.....	8
Duodenum, perforating	4	1	3	2	2	.....	.....	.....	.....
Epiglottis	1	.....	1	.....	1	.....	.....	.....	.....
Eye and annexa	2	.....	2	.....	2	.....	.....	.....	.....
Mouth	40	1	3	1	2	.....	.....	1	36
Nasal passage	10	.....	3	.....	3	.....	.....	.....	7
Rectum	7	.....	1	1	.....	.....	.....	.....	6
Skin	516	18	167	71	96	4	.....	14	331
Skin, varicose	134	1	50	16	30	.....	.....	5	83
Stomach	74	4	35	14	19	3	2	1	35
Stomach, perforating	3	.....	3	2	.....	.....	.....	1	.....
Phagedenic	13	1	9	5	4	1	.....	.....	3
Uncinariasis, Necator americanus	8	.....	6	4	2	.....	.....	.....	2
Union of bone, faulty	5	.....	4	1	.....	.....	.....	3	1
Ureteral colic	10	.....	9	6	1	.....	.....	2	1
Ureteritis	15	.....	10	5	5	.....	.....	.....	5
Urethral fever, traumatic	3	.....	3	2	1	.....	.....	.....	.....
Urethritis, acute	62	.....	3	2	1	.....	.....	.....	59
Urethritis, chronic	19	.....	1	.....	.....	.....	1	.....	18
Urticaria	75	.....	12	9	2	1	.....	.....	63
Vaccinia	351	.....	15	11	3	1	.....	.....	336
Valvular disease, chronic cardiac, mitral	229	9	108	2	69	7	23	16	112
Valvular disease, chronic cardiac, aortic	50	1	14	.....	9	2	4	.....	35
Valvular disease, chronic cardiac, aortic, and mitral	13	2	11	.....	8	1	2	2	.....
Valvular disease, chronic cardiac, unclassified	89	10	59	4	38	.....	19	8	20
Varicocele	161	3	69	62	4	5	.....	1	89
Varix	170	7	83	39	38	5	.....	8	80
Vertigo	17	.....	3	1	1	1	.....	.....	14
Vincent's angina	8	.....	4	3	1	.....	.....	.....	4
Wart	114	.....	10	4	4	2	.....	.....	104
Zoster	58	1	9	3	7	.....	.....	.....	48

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Affections due to poisonings and intoxications.									
Alcohol	332	5	204	155	43	8	2	1	123
Chloral hydrate, acute	2	.....	2	2	.....	.....	.....	.....	.....
Copabia	4	.....	2	2	.....	.....	.....	.....	2
Creatoxismus	14	.....	10	9	1	.....	.....	.....	4
Lead, acute	4	.....	1	.....	1	.....	.....	.....	3
Gasoline	2	.....	.....	.....	.....	.....	.....	.....	2
Fish	12	.....	4	4	.....	.....	.....	.....	8
Mercury, acute	5	.....	3	1	2	.....	.....	.....	2
Mercury, chronic	2	.....	2	2	.....	.....	.....	.....	.....
Morphine, acute	2	.....	2	.....	.....	1	1	.....	.....
Morphine, chronic	6	.....	6	.....	3	2	1	.....	.....
Nicotine, chronic	5	.....	1	.....	1	.....	.....	.....	4
Opium, chronic	4	.....	3	.....	2	1	.....	.....	1
Quinine	1	.....	1	1	.....	.....	.....	.....	.....
Trional	1	.....	1	.....	.....	.....	1	.....	.....
Tobacco, chronic	11	.....	1	.....	1	.....	.....	.....	10
Injuries (wounds, etc.).									
Abrasion of:									
Abdominal wall	3	.....	3	3	.....	.....	.....	.....	.....
Arm	13	.....	2	.....	1	.....	1	.....	11
Back	4	.....	.....	.....	.....	.....	.....	.....	4
Breast	1	.....	.....	.....	.....	.....	.....	.....	1
Chest wall	1	.....	.....	.....	.....	.....	.....	.....	1
External ear	1	.....	1	1	.....	.....	.....	.....	.....
Eye	2	.....	.....	.....	.....	.....	.....	.....	2
Eyelid	3	.....	.....	.....	.....	.....	.....	.....	3
Finger	28	1	3	3	1	.....	.....	.....	24
Foot	25	.....	5	2	2	1	.....	.....	20
Face	11	.....	1	1	.....	.....	.....	.....	10
Forearm	4	.....	.....	.....	.....	.....	.....	.....	4
Hand	41	.....	2	2	.....	.....	.....	.....	39
Leg	51	.....	9	7	1	.....	.....	1	42
Lip	3	.....	.....	.....	.....	.....	.....	.....	3
Knee	1	.....	1	1	.....	.....	.....	.....	.....
Mouth	1	.....	.....	.....	.....	.....	.....	.....	1
Neck	1	.....	.....	.....	.....	.....	.....	.....	1
Nose	1	.....	1	.....	.....	1	.....	.....	.....
Penis	14	.....	.....	.....	.....	.....	.....	.....	14
Rectum	1	.....	.....	.....	.....	.....	.....	.....	1
Scalp	9	.....	1	.....	1	.....	.....	.....	8
Scrotum	3	.....	.....	.....	.....	.....	.....	.....	3
Thigh	5	.....	1	1	.....	.....	.....	.....	4
Toe	4	.....	1	.....	1	.....	.....	.....	3
Unclassified	2	.....	.....	.....	.....	.....	.....	.....	2
Avulsion of:									
Arm, complete	1	.....	1	1	.....	.....	.....	.....	.....
Finger, complete	5	.....	1	.....	1	.....	.....	.....	4
Finger, partial	6	.....	4	3	1	.....	.....	.....	2
Finger nail	11	.....	.....	.....	.....	.....	.....	.....	11
Foot, partial	1	.....	1	.....	.....	.....	.....	1	.....
Leg, partial	1	.....	1	.....	.....	.....	.....	1	.....
Burn of:									
Abdominal wall	8	.....	3	1	1	.....	.....	1	5
Arm	149	2	24	20	6	.....	.....	.....	123
Back	15	.....	4	3	1	.....	.....	.....	11
Breast	2	.....	1	1	.....	.....	.....	.....	1
Buttock	7	.....	3	3	.....	.....	.....	.....	4
Chest wall	8	1	3	4	.....	.....	.....	.....	4
Eye	17	.....	3	3	.....	.....	.....	.....	14
Eyelid	2	.....	.....	.....	.....	.....	.....	.....	2
External ear	2	.....	.....	.....	.....	.....	.....	.....	2
Face	56	2	24	18	8	.....	.....	.....	30
Finger	22	.....	2	1	1	.....	.....	.....	20
Foot	82	3	33	24	11	1	.....	.....	46
Forearm	71	.....	11	8	3	.....	.....	.....	60
Hand	119	.....	21	13	8	.....	.....	.....	98
Leg	109	2	22	13	8	.....	.....	3	85
Mouth	1	.....	.....	.....	.....	.....	.....	.....	1
Neck	2	.....	.....	.....	.....	.....	.....	.....	2
Penis	4	.....	2	.....	2	.....	.....	.....	2
Scalp	3	.....	1	1	.....	.....	.....	.....	2

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Injuries (wounds, etc.)—Contd.									
Burn of—Continued.									
Shoulder	23	.....	4	1	2	.....	.....	1	19
Thigh	25	.....	4	3	1	.....	.....	.....	21
Unclassified	11	.....	4	2	2	.....	.....	.....	7
Burns, multiple	33	.....	26	11	12	.....	2	1	7
Contusion of:									
Abdominal wall	34	.....	13	8	4	.....	.....	1	21
Arm	88	.....	18	12	6	.....	.....	.....	70
Ankle	2	.....	2	.....	1	1	.....	.....	.....
Back	174	2	61	37	23	.....	.....	3	111
Bone	12	.....	5	1	3	.....	.....	1	7
Breast	6	.....	2	1	1	.....	.....	.....	4
Buttock	6	.....	.....	.....	.....	.....	.....	.....	6
Brachial plexus	1	.....	1	.....	1	.....	.....	.....	.....
Chest wall	243	.....	56	36	18	1	.....	1	187
Eyeball	8	.....	3	2	1	.....	.....	.....	5
Eyelid	31	.....	6	5	1	.....	.....	.....	25
External ear	4	.....	.....	.....	.....	.....	.....	.....	4
Face	60	.....	27	13	12	1	.....	1	33
Finger	199	1	20	8	12	1	.....	.....	178
Foot	326	5	107	60	46	4	.....	2	214
Forearm	38	.....	4	2	2	.....	.....	.....	34
Hand	165	1	27	12	13	2	.....	1	137
Joint	139	5	59	35	29	.....	.....	.....	75
Leg	292	4	84	48	36	2	.....	2	204
Lip	6	.....	2	.....	2	.....	.....	.....	4
Mouth	4	.....	1	.....	1	.....	.....	.....	3
Muscle	12	.....	2	.....	2	.....	.....	.....	10
Neck	19	.....	3	2	1	.....	.....	.....	16
Nerve	9	.....	2	.....	.....	2	.....	.....	7
Nose	8	.....	2	2	.....	.....	.....	.....	6
Perineum	6	.....	4	3	1	.....	.....	.....	2
Peritoneum	1	.....	1	.....	1	.....	.....	.....	.....
Scalp	31	.....	10	8	2	.....	.....	.....	21
Scrotum	5	.....	1	1	.....	.....	.....	.....	4
Shoulder	118	4	35	16	18	2	1	2	79
Stomach	3	.....	2	2	.....	.....	.....	.....	1
Testicle	37	.....	11	6	4	.....	.....	1	26
Thigh	61	.....	22	10	12	.....	.....	.....	39
Toe	63	1	15	10	6	.....	.....	.....	47
Unclassified	67	1	9	8	2	.....	.....	.....	57
Contusions, multiple	25	1	22	13	9	.....	.....	1	2
Crush of:									
Finger	40	.....	5	3	2	.....	.....	.....	35
Foot	3	.....	.....	.....	.....	.....	.....	.....	3
Hand	9	.....	4	1	3	.....	.....	.....	5
Leg	3	.....	3	1	1	.....	.....	1	.....
Thigh	1	.....	1	1	.....	.....	.....	.....	.....
Toe	15	.....	5	3	1	.....	.....	1	10
Unclassified	1	.....	1	.....	1	.....	.....	.....	.....
Dislocation of:									
Ankle	3	1	2	3	.....	.....	.....	.....	.....
Clavicle	6	.....	3	.....	3	.....	.....	.....	3
Coccyx	2	.....	1	.....	.....	1	.....	.....	1
Elbow	7	.....	5	3	2	.....	.....	.....	2
Finger	15	.....	6	3	3	.....	.....	.....	9
Hip	5	1	4	3	1	1	.....	.....	.....
Inter-articular cartilage	4	1	3	.....	2	.....	.....	2	.....
Knee	4	.....	3	1	2	.....	.....	.....	1
Metacarpus	2	.....	1	.....	1	.....	.....	.....	1
Metatarsus	2	.....	.....	.....	.....	.....	.....	.....	2
Nasal cartilage	3	.....	3	2	1	.....	.....	.....	.....
Shoulder	58	2	31	23	10	.....	.....	.....	25
Tarsus	2	.....	1	.....	1	.....	.....	.....	1
Thumb	17	.....	5	2	1	2	.....	.....	12
Toe	1	.....	.....	.....	.....	.....	.....	.....	1
Vertebra	2	.....	.....	.....	.....	.....	.....	.....	2
Wrist	14	1	7	2	6	.....	.....	.....	6
Emphysema, traumatic	1	.....	1	1	.....	.....	.....	.....	.....
Exhaustion from overexertion and exposure	4	.....	4	2	.....	.....	.....	2	.....
Foreign body in:									
Auditory canal	21	.....	1	.....	1	.....	.....	.....	20
Arm	6	.....	.....	.....	.....	.....	.....	.....	6

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Injuries (wounds, etc.)—Contd.									
Foreign body in—Continued.									
Eye	233		10	7	3				223
Bone	2								2
Esophagus	1								1
Foot	5		1	1					4
Forearm	3		1	1					2
Finger	21								21
Hand	29		2		2				27
Joint	1								1
Leg	1								1
Lip	3								3
Urethra	1								1
Pharynx	2								2
Salivary gland	1								1
Unclassified	4		1			1			3
Fracture about ankle joint, simple	28		24	11	9			4	4
Fracture about wrist joint, simple	32		18	11	7				14
Fracture of bones of:									
Face, compound	5	1	3	3	1				1
Face, simple	21	1	5	1	4	1			15
Foot, compound	4	1	3	2	2				
Foot, simple	64	4	45	32	14			3	15
Forearm, compound	7	1	4	1	3	1			2
Forearm, simple	95	3	48	17	31			3	44
Hand, compound	53	1	21	7	14	1			31
Hand, simple	89	5	30	19	13	2		1	54
Leg, compound	50	6	37	18	15	1	1	8	7
Leg, simple	155	18	89	56	37	3		11	48
Fracture of:									
Clavicle, simple	37	2	24	17	9				11
Costal cartilage, simple	2		1	1					1
Femur, compound	5		4	2	1		1		1
Femur, simple	50	13	29	15	13	4	1	9	8
Humerus, compound	3		3	1	2				
Humerus, simple	25	2	16	11	6	1			7
Inferior maxilla, compound	14		11	6	4	1			3
Inferior maxilla, simple	13		9	7	2				4
Nasal septum	15		6	5	1				9
Patella, simple	16	3	8	7	2			2	5
Pelvis, simple	9		9	4	1			4	
Rib, compound	3		2	2					1
Rib, simple	171	4	67	39	31			1	100
Scapula, compound	2		1		1				1
Scapula, simple	3		1	1					2
Skull, compound	12		9	2	1		5	1	3
Skull, simple	19		14	8	2		4		5
Sternum, simple	1		1		1				
Vertebra, simple	8	3	3				1	5	2
Unclassified	16	1	12	9	4				3
Frostbite of:									
External ear	6		1		1				5
Finger	8		4		4				4
Foot	16	1	4	2	3				11
Hand	5		1	1					4
Toe	5		5	4	1				
Heat cramps	9		5	4	1				4
Heat exhaustion	36	1	20	18	2		1		15
Hematoma, unclassified	25		3		2	1			22
Hemorrhage under conjunctiva, traumatic	4		1		1				3
Intracraneal injury	27		22	10	9	1	1	1	5
Intraspinal injury	7		3	2		1			4
Multiple injuries, extreme	19	2	15	9	4		4		2
Operation wounds	54		2	1	1				52
Rupture of:									
Bladder	1		1				1		
Eyeball	2		1		1				1
Ligament	2								2
Muscle	5		3	1	2				2
Nerve	1								1
Tendon	1								1
Tympanum, traumatic	5		3	3					2
Unclassified	7	1	5	2	2		1	1	1

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Injuries (wounds, etc.)—Contd.									
Sprain of:									
Ankle	277	10	116	76	42	2	.....	6	151
Back	169	.....	52	32	19	.....	.....	1	117
Elbow	22	.....	5	2	2	.....	.....	1	17
Finger	29	.....	4	2	2	.....	.....	.....	25
Forearm	1	.....	1	.....	1	.....	.....	.....	.....
Hand	28	.....	1	1	.....	.....	.....	.....	27
Hip	11	1	3	2	2	.....	.....	.....	7
Joint	56	.....	12	7	4	1	.....	.....	44
Knee	100	4	33	15	18	1	.....	3	63
Shoulder	47	.....	9	7	2	.....	.....	.....	38
Tendon	1	.....	.....	.....	.....	.....	.....	.....	1
Thumb	9	.....	.....	.....	.....	.....	.....	.....	9
Toe	6	.....	.....	.....	.....	.....	.....	.....	6
Wrist	119	1	22	15	8	.....	.....	.....	96
Unclassified	17	.....	1	.....	1	.....	.....	.....	16
Strain of muscle	151	2	21	13	8	1	.....	1	128
Strain of knee	3	.....	2	2	.....	.....	.....	.....	1
Submersion	3	.....	2	1	1	.....	.....	.....	1
Sunstroke (heat stroke)	14	.....	14	13	1	.....	.....	.....	.....
Sunburn of legs	9	.....	1	1	.....	.....	.....	.....	8
Synovitis, traumatic	7	.....	5	2	1	2	.....	.....	2
Thermic fever	2	.....	1	1	.....	.....	.....	.....	1
Inhalation of smoke	2	.....	1	1	.....	.....	.....	.....	1
Wounds, incised:									
Arm	31	.....	7	2	4	1	.....	.....	24
Back	4	.....	.....	.....	.....	.....	.....	.....	4
Buttock	1	.....	.....	.....	.....	.....	.....	.....	1
Bursa	1	.....	1	1	.....	.....	.....	.....	.....
Chest wall	3	.....	1	1	.....	.....	.....	.....	2
Eyelid	5	.....	1	1	.....	.....	.....	.....	4
Face	22	.....	2	2	.....	.....	.....	.....	20
Finger	91	.....	7	4	3	.....	.....	.....	84
Foot	22	.....	7	4	2	1	.....	.....	15
Forearm	11	.....	1	.....	1	.....	.....	.....	10
Hand	58	.....	7	3	3	1	.....	.....	51
Leg	30	.....	9	6	3	.....	.....	.....	21
Lips	6	.....	2	2	.....	.....	.....	.....	4
Muscle	2	2	.....	1	.....	1	.....	.....	.....
Neck	9	.....	1	.....	1	.....	.....	.....	8
Nerve	1	.....	.....	.....	.....	.....	.....	.....	1
Nose	1	.....	.....	.....	.....	.....	.....	.....	1
Perineum	1	.....	1	.....	1	.....	.....	.....	.....
Scalp	38	.....	9	7	2	.....	.....	.....	29
Scrotum	1	.....	1	1	.....	.....	.....	.....	.....
Thigh	4	.....	1	1	.....	.....	.....	.....	3
Wounds, infected:									
Finger	4	.....	4	2	2	.....	.....	.....	.....
Foot	4	.....	4	2	2	.....	.....	.....	.....
Hand	3	.....	1	.....	1	.....	.....	.....	2
Leg	4	.....	4	3	1	.....	.....	.....	.....
Wounds, gunshot:									
Arm	4	.....	3	3	.....	.....	.....	.....	1
Breast	2	.....	2	2	.....	.....	.....	.....	.....
Buttock	1	.....	1	1	.....	.....	.....	.....	.....
Face	3	.....	2	1	1	.....	.....	.....	1
Finger	4	.....	2	.....	2	.....	.....	.....	2
Foot	3	.....	3	2	1	.....	.....	.....	.....
Forearm	1	.....	1	.....	1	.....	.....	.....	.....
Leg	2	.....	2	2	.....	.....	.....	.....	.....
Lung	2	.....	2	1	1	.....	.....	.....	.....
Neck	1	.....	1	.....	1	.....	.....	.....	.....
Thigh	3	.....	2	1	1	.....	.....	.....	1
Wounds, lacerated:									
Arm	59	.....	13	7	5	.....	.....	1	46
Back	2	.....	1	1	.....	.....	.....	.....	1
Abdominal wall	3	.....	.....	.....	.....	.....	.....	.....	3
Breast	1	.....	.....	.....	.....	.....	.....	.....	1
Chest wall	5	.....	2	2	.....	.....	.....	.....	3
External ear	11	.....	4	2	2	.....	.....	.....	7
Eye	9	1	3	1	3	.....	.....	.....	5
Eyelid	10	1	4	2	3	.....	.....	.....	5
Face	83	1	27	16	12	.....	.....	.....	55

TABLE 4.—*Tabular statement of diseases and injuries treated, etc.*—Continued.

Diseases and injuries.	Total treated in hospital and dispensary.	Remaining in hospital from previous year.	Admitted during the year.	Recovered.	Improved.	Not improved.	Died.	Remaining in hospital at close of year.	Treated at dispensary.
Injuries (wounds, etc.)—Contd.									
Wounds, lacerated—Continued.									
Finger	357	3	56	25	31	1	.....	2	298
Foot	85	1	18	10	6	.....	.....	3	66
Forearm	24	.....	3	1	2	.....	.....	.....	21
Hand	241	2	36	22	15	.....	.....	1	203
Joint	7	.....	7	5	1	.....	.....	1	.....
Leg	141	5	33	23	15	.....	.....	.....	103
Lips	19	.....	3	3	.....	.....	.....	.....	16
Muscle	1	.....	1	.....	1	.....	.....	.....	.....
Nerve	3	.....	.....	.....	.....	.....	.....	.....	3
Nose	15	.....	4	4	.....	.....	.....	.....	11
Scalp	159	.....	39	30	8	.....	.....	1	120
Scrotum	4	.....	3	3	.....	.....	.....	.....	1
Shoulder	1	.....	1	.....	1	.....	.....	.....	.....
Thigh	6	.....	3	2	1	.....	.....	.....	3
Toe	43	1	20	12	7	.....	.....	2	22
Unclassified	5	.....	2	.....	2	.....	.....	.....	3
Wounds, punctured:									
Arm	11	.....	4	3	1	.....	.....	.....	7
Back	1	.....	.....	.....	.....	.....	.....	.....	1
Chest wall	2	.....	1	1	.....	.....	.....	.....	1
Eye	2	.....	1	1	.....	.....	.....	.....	1
Eyelid	2	.....	1	1	.....	.....	.....	.....	1
Finger	57	.....	7	3	4	.....	.....	.....	50
Foot	54	.....	15	8	6	1	.....	.....	39
Forearm	5	.....	.....	.....	.....	.....	.....	.....	5
Hand	40	.....	10	5	4	.....	.....	1	30
Joint	8	.....	3	.....	2	.....	.....	1	5
Leg	22	.....	5	3	1	.....	.....	1	17
Nerve	2	1	1	.....	2	.....	.....	.....	.....
Pharynx	1	.....	1	.....	1	.....	.....	.....	.....
Shoulder	2	1	1	2	.....	.....	.....	.....	.....
Thigh	5	.....	3	2	1	.....	.....	.....	2
Unclassified	2	.....	1	1	.....	.....	.....	.....	1
Wounds, stab:									
Arm	3	.....	1	1	.....	.....	.....	.....	2
Back	5	.....	4	2	2	.....	.....	.....	1
Chest wall	5	.....	3	2	1	.....	.....	.....	2
Neck	1	.....	1	1	.....	.....	.....	.....	.....
Shoulder	2	.....	.....	.....	.....	.....	.....	.....	2
Wounds, unclassified:									
Arm	44	.....	6	4	2	.....	.....	.....	38
Ankle	1	.....	1	1	.....	.....	.....	.....	.....
Abdominal wall	24	.....	3	2	1	.....	.....	.....	21
Artery	1	.....	1	1	.....	.....	.....	.....	.....
Back	9	.....	1	1	.....	.....	.....	.....	8
Buttock	4	.....	1	1	.....	.....	.....	.....	3
Chest wall	5	.....	1	.....	1	.....	.....	.....	4
Elbow	1	.....	1	.....	1	.....	.....	.....	.....
External ear	9	.....	2	.....	2	.....	.....	.....	7
Eyelid	7	1	1	1	1	.....	.....	.....	5
Eye	3	.....	.....	.....	.....	.....	.....	.....	3
Face	83	.....	13	10	3	.....	.....	.....	70
Finger	383	.....	18	7	8	2	.....	1	365
Foot	116	1	32	24	7	1	1	.....	83
Forearm	42	.....	3	2	1	.....	.....	.....	39
Hand	280	3	26	15	13	.....	.....	1	251
Joint	10	.....	.....	.....	.....	.....	.....	.....	10
Knee	2	.....	2	.....	2	.....	.....	.....	.....
Leg	14	.....	14	8	6	.....	.....	.....	.....
Lips	94	.....	5	5	.....	.....	.....	.....	89
Lung	1	.....	.....	.....	.....	.....	.....	.....	1
Mouth	2	.....	.....	.....	.....	.....	.....	.....	2
Neck	4	1	1	1	1	.....	.....	.....	2
Nose	5	.....	2	2	.....	.....	.....	.....	3
Penis	8	.....	1	1	.....	.....	.....	.....	7
Scalp	84	.....	14	6	8	.....	.....	.....	70
Scrotum	5	.....	2	1	.....	.....	.....	1	3
Shoulder	2	.....	.....	.....	.....	.....	.....	.....	2
Toe	27	.....	4	1	2	1	.....	.....	23
Thigh	15	.....	3	3	.....	.....	.....	.....	12
Total	58,906	1,124	15,682	7,473	6,983	665	501	1,184	44,100

TABLE 5.—*Surgical operations performed during the fiscal year 1917.*

Operation for—	Character or name of operation.	Cases.	Result.		
			Successful.	Unsuccessful.	Died.
Abscess:					
Abdominal wall	Incised and drained	2	2		
Alveolar	do	5	5		
Appendix	do	5	5		
Arm	do	7	7		
Do	Incised and curetted	4	4		
Do	Incised	2	2		
Axilla	do	1	1		
Do	Incised and drained	4	4		
Buttock	do	1	1		
Chest	do	2	2		
Ear	Paracentesis of eardrum	1	1		
Elbow joint	Incised and drained	1	1		
Epididymis	Incised	1	1		
Do	Incised and drained	1	1		
Eyelid	do	1	1		
Face	do	1	1		
Do	Incised and curetted	1	1		
Finger	Incised and drained	5	5		
Do	Incised	1	1		
Foot	Incised and drained	3	3		
Do	Incised	2	2		
Forearm	Incised and curetted	1	1		
Do	Incised and drained	1	1		
Groin	Incised	2	2		
Hand	do	3	3		
Do	Incised and drained	14	14		
Do	Incised and curetted	1	1		
Hip	do	2	2		
Inguinal glands	Incised and drained	3	3		
Ischiorectal	do	10	10		
Do	Incised	2	2		
Jaw	Incised and drained	1	1		
Jaw and neck	Incised, curetted, and drained	1	1		
Knee	Bone curetted	1	1		
Leg	Incised and drained	7	7		
Liver	do	1	1		
Lymph nodes, inguinal	Excision and drained	9	9		
Do	Incised and drained	4	4		
Do	Incised, curetted, and drained	2	2		
Lung	Resection of rib and drained	1			1
Mammary gland	Removal of gland	1	1		
Muscle of back	Incised and drained	1	1		
Neck	do	3	3		
Do	Incised, curetted, and drained	1			1
Orbital	Incised and drained	1	1		
Palmer	do	2	2		
Do	Incised	2	2		
Parasternal	Aspiration and injection of acid salicylic.	1		1	
Penis	Incised and drained	1	1		
Perineum	do	2	2		
Do	Incised, curetted, and drained	2	2		
Peritoneum	Incised and drained	4	4		
Peritonsillar	Incised	1	1		
Periurethral	Incised and drained	1	1		
Perinephritis	do	1	1		
Pharynx	Incised and curetted	1	1		
Prostate gland	Incised and drained	1	1		
Scalp	do	1	1		
Scrotum	do	8	6		2
Do	Incised	2	2		
Shoulder	Incised and drained	1	1		
Subrectal	do	1	1		
Testicle	Incised	1	1		
Tendon sheath	Incised and drained	4	4		
Thigh	do	6	6		
Thyroid gland	do	1	1		
Thumb	Incised and drained	2	2		
Toe	Incised and curetted	2	2		
Do	Excision of nail	1	1		
Tonsils	Incised	6	6		
Do	Incised and drained	1	1		
Undefined	do	4	4		
Abrasion of ear, external	Sutured	1	1		
Adhesion of:					
Knee tendons	Breaking up adhesions	1	1		
Ankle	do	1	1		
Peritoneum	Portion of omentum removed	1	1		

TABLE 5.—*Surgical operations performed during the fiscal year 1917*—Contd.

Operation for—	Character or name of operation.	Cases.	Result.		
			Successful.	Unsuccessful.	Died.
Adenitis, inguinal	Incised	2	2		
Do	Incised and curetted	1	1		
Do	Excised	1	1		
Adenoids	Incised and curetted	2	2		
Do	Adenectomy	4	4		
Amygdalitis, acute, fol	Tonsillectomy	34	34		
Aneurysm of radial artery	Ligation and resection	1	1		
Ankylosis knee joint	Resection and Lane's plate	1	1		
Angina ludovici	Incised and drained	1	1		
Antityphoid inoculation		207	207		
Antismallpox inoculation		7	7		
Appendicitis	Appendectomy	108	103		5
Do	McBurney	1	1		
Do	Gridiron	1	1		
Do	Incised and drained	7	7		
Appendicitis and ulcer of stomach	Gastro-enterostomy	1	1		
Arthritis of knee, acute	Incised and drained	1	1		
Atrophy of optic nerve	Enucleation	1	1		
Avulsion of:					
Finger	Amputation	3	3		
Do	Skin graft	1	1		
Leg	Amputation	2	2		
Thumb	do	2	2		
Balanoposthitis	Circumcision	4	4		
Burn of:					
Abdomen	Skin graft	1	1		
Chest	do	1	1		
Arm	Dressed	1	1		
Bursitis, acute, of:					
Olecranon	Aspirated	1	1		
Do	Incised and drained	1	1		
Do	Excised and drained	2	2		
Patella	Excised	1	1		
Calculus in bladder	Suprapubic lithotomy	1	1		
Carcinoma of:					
Abdominal wall	Excision	1	1		
Bladder	Exploratory laparotomy	1			1
Liver	do	1		1	
Mouth	Excision and cauterization	1	1		
Stomach	Exploratory laparotomy	1			1
Rectum	Laparotomy	1			1
Carbuncle of:					
Back	Incised, curetted, and drained	2	2		
Buttock	Incised	1	1		
Chest	do	1	1		
Neck	Incised, curetted, and drained	2	2		
Do	Incised and drained	1	1		
Do	Incised and curetted	1	1		
Do	Excised and drained	1	1		
Do	Incised and injection carbolic acid	1	1		
Caries of:					
Phalanx	Amputation	1	1		
Teeth	Extraction	7	7		
Toe	Amputation	1	1		
Submaxilla	Incised, curetted, and extraction teeth	1	1		
Do	Incised and curetted	1	1		
Cataract of eye	Removal of lens	4	4		
Do	Excision	1	1		
Cellulitis of:					
Arm	Incised and drained	1	1		
Finger	do	1	1		
Do	Amputation	1	1		
Forearm	Incised and drained	1	1		
Foot	do	2	2		
Hand	do	10	10		
Knee	do	2	2		
Leg	do	2	2		
Neck	do	1	1		
Perineum	do	1			1
Toe	Amputation	1	1		
Chalazion	Incised and curetted	4	4		
Chancroid of penis	do	1	1		
Do	Excised and drained	5	5		
Do	Circumcision	12	12		
Do	Dorsal incision	2	2		
Do	Injection neosalvarsan	2	2		
Cholecystitis, chronic, and adhesions of gall bladder and intestines.	Separations and treatment of adhesions.	1	1		
Cholecystitis, chronic	Cholecystotomy	2	1		1
Do	Incised and drained	2	1		1

TABLE 5.—*Surgical operations performed during the fiscal year 1917*—Contd.

Operation for—	Character or name of operation.	Cases.	Result.		
			Successful.	Unsuccessful.	Died.
Cholelithiasis	Cholelithotomy	2	2		
Cirrhosis of liver	Exploratory laparotomy	1			1
Clavis of foot	Excision	1	1		
Contusion of:					
Eyelid	Evacuation of pus and dressed	1	1		
Finger	Amputation	1	1		
Do	Incised and drained	1	1		
Foot	do	2	2		
Do	Amputation toe	1	1		
Hand	Incised and drained	1	1		
Scalp	Incised and packed	1	1		
Crush of leg	Amputation	1	1		
Cyst of:					
Back	Excision	2	2		
Chest wall	do	1	1		
Ear	do	1	1		
Finger	do	1	1		
Forehead	do	2	2		
Hand	do	1	1		
Kidney	do	1	1		
Lacrymal duct	do	1	1		
Neck	do	2	2		
Sebaceous	do	19	19		
Testicle	do	1	1		
Scalp	do	1	1		
Undefined		6	6		
Cystitis	Suprapubic cystotomy	1			1
Deviation of nasal septum	Submucous resection	4	4		
Do	Extraction of cartilage	1	1		
Diabetic gangrene of foot	Amputation	1	1		
Dislocation of:					
Carpus	Reduction and cast	2	2		
Elbow	Reduced	2	2		
Hip	do	1	1		
Humerus	do	1	1		
Knee	do	1	1		
Metatarsal	do	1	1		
Shoulder	Reduced and cast applied	1	1		
Do	Reduced and splint applied	1	1		
Do	Reduced	9	9		
Ectropion	Incised	1	1		
Elongated prepuce	Circumcision	2	2		
Empyema	Resection of rib and drained	1	1		
Do	Incised	1	1		
Enlarged prostate gland	Suprapubic prostatectomy	3	1		2
Endothelioma, parotid region	Excision	1	1		
Epididymitis	Epididymectomy	1	1		
Do	Incised	2	2		
Epithelioma of—					
Eyelid	Enucleation of eyeball and excision of lid.	1	1		
Do	Excision	1	1		
Lip	do	3	3		
Fibroma of scalp	Excised	1	1		
Fissure of anus	do	1	1		
Do	Stretched and cauterized	1	1		
Fistula in ano	Incised	7	6		1
Do	Incised and curetted	33	32		1
Fistula, urethral	Incised	3	3		
Fistula, ischio-rectal	Incised and curetted	2	2		
Foreign body in—					
Eye	Removed	6	6		
Cornea	do	5	5		
Finger	do	1	1		
Forearm	do	1	1		
Hand	do	2	2		
Foot	do	1	1		
Fracture of—					
Ankle	Reduced	2	2		
Do	Reduced and splint applied	2	2		
Clavicle	Reduced	3	3		
Finger	do	1	1		
Do	Amputated	1	1		
Fibula	Reduced	1	1		
Do	Reduced and splint applied	6	6		
Femur	do	5	4	1	
Do	Reduced and plate applied	1	1		
Do	Wired and cast applied	1		1	
Face	Approximation of fragments and wired	2	2		
Forearm	Reduced	1	1		

TABLE 5.—*Surgical operations performed during the fiscal year 1917*—Contd.

Operation for—	Character or name of operation.	Cases.	Result.		
			Successful.	Unsuccessful.	Died.
Fracture of—Continued.					
Hand	Reduced and splint applied	1	1		
Do	Amputation of thumb	1	1		
Humerus	Reduced	1	1		
Do	Wired	1	1		
Do	Reduced and splint applied	3	3		
Inferior maxilla	Reduced	2	2		
Do	Reduced and plate applied	2	2		
Do	Reduced and splint applied	2	2		
Do	Reduced and cast applied	2	2		
Jaw, with abscess	Incised and drained	1	1		
Leg	Reduced and plaster cast applied	2	2		
Do	Excised and wired	1	1		
Metatarsal	Reduced	4	4		
Do	Reduced and cast applied	3	3		
Nasal septum	Reduced and splint applied	1	1		
Os calcis	do	1	1		
Phalanx of toe	do	5	5		
Patella	Incised and bone removed	1	1		
Do	Reduced	1	1		
Do	Wired	1	1		
Do	Circular suture	1	1		
Rib	Strapped	3	3		
Do	Reduced and splint applied	5	5		
Radius	Reduced and cast applied	1	1		
Do	Reduced and splint applied	2	2		
Skull	Excision of bone	2			2
Do	Dressed	1	1		
Skull and clavicle	Clavicle wired	1	1		
Tibia and fibula	Reduced and splint applied	8	8		
Do	Plate applied	1	1		
Do	Wired	2	2		
Do	Bone graft	2	2		
Do	Amputation	1	1		
Do	Wired and plate applied	1	1		
Do	Fragments removed	2	2		
Tibia	Reduced	1	1		
Do	Reduced and splint applied	2	2		
Do	Wired	1	1		
Do	Bone graft	1	1		
Do	Reduced and cast applied	1	1		
Tarsus	Reduced	1	1		
Toe	do	1	1		
Do	Amputation	1	1		
Ulna	Reduced	1	1		
Ulna and radius	do	1	1		
Do	Reduced and splint applied	2	2		
Do	Lane's plate	1	1		
Wrist	Reduced	1	1		
Do	Reduced and splint applied	2	2		
Frostbite of:					
Fingers	Amputation	7	7		
Toes	do	1	1		
Furunculosis	Incised	9	9		
Do	Incised and drained	28	8		
Do	Incised and curetted	1	1		
Gallstones and cholecystitis	Appendectomy and cholecystotomy	1	1		
Gangrene of:					
Finger	Amputation	1	1		
Foot	do	1	1		
Perineum	Incised	1	1		
Thigh (stump)	Bone resected and stump repaired	1	1		
Glaucoma of eye	Elliott's operation	1	1		
Goiter, exophthalmic	Resection	2	1	1	
Gonococcus infection of lymph nodes, inguinal.	Incised and drained	6	6		
Do	Excised	10	10		
Do	Excised and drained	13	13		
Gonococcus infection of penis and phimosis.	Circumcision	2	2		
Do	Doral incision	1	1		
Gonococcus infection of knee joint	Incised and drained	1	1		
Gonococcus infection of penis, stricture of urethra, and extravasation of urine.	External urethrotomy	1	1		
Hallux valgus	Excision	3	3		
Hammer toe	Tenotomy and excision of joint	1	1		
Do	Amputation	1	1		
Hematoma	Incised and curetted	1	1		

TABLE 5.—*Surgical operations performed during the fiscal year 1917*—Contd.

Operation for—	Character or name of operation.	Cases.	Result.		
			Successful.	Unsuccessful.	Died.
Hematoma of leg	Incised and drained	1	1		
Hemorrhage into cerebrum	Bilateral decompression	1			1
Hemorrhoids:					
Internal	Whitehead	1	1		
Do	Ferguson	1	1		
Do	Clamp and cautery	7	7		
Do	Ligation and excision	6	6		
External	Excision	7	7		
Do	Ligation and excision	4	4		
Do	Thermo-cautery	1	1		
Mixed	Ligation and excision	6	6		
Do	Excision	8	8		
Do	Ligation	4	4		
Do	Clamp and cautery	25	25		
Hernia:					
Inguinal	Incised and sutured	1	1		
Do	Radical cure	17	17		
Do	Herniotomy	37	37		
Do	Bassini	85	82	3	
Do	Bassini, modified	66	66		
Do	Bates	25	25		
Do	Andrews	20	20		
Do	Halstead	1	1		
Femoral	Radical cure	4	4		
Ventral	Excised and reduced	2	2		
Do	Hernial repair	4	4		
Do	Herniotomy	1	1		
Abdominal	Repair of abdominal wall	1	1		
Inguinal and orchitis	Bassini's operation and orchidectomy	1	1		
Hernia and malformation of testicle	Castration and sacs closed	1	1		
Hydrocele of tunica vaginalis	Aspiration	4	4		
Do	Incised and drained	3	2	1	
Do	Excised	9	9		
Do	Tapped	16	16		
Do	Tapped and injection of carbolic acid	1	1		
Do	Tapped and injection of iodine	2	2		
Do	Bottle operation	6	6		
Do	Resection and castration	1	1		
Hypertrophy of:					
Tonsil	Tonsillectomy	21	21		
Do	Excision	8	8		
Turbinate bone	Turbinectomy	1	1		
Prostate gland	Suprapubic cystotomy	1	1		
Hydronephrosis	Nephrectomy	2	1		1
Hypospadia, congenital	Urethral repair	1	1		
Inflammation of:					
Cell tissue of neck	Incised	1	1		
Lacrymal sac	do	1	1		
Connective tissue of leg	Incised and drained	1	1		
Lymph glands, groin	Incised and dissected	18	18		
Ingrowing nail	Excision	9	9		
Lipoma of:					
Back	Excised	4	4		
Hip	Incised and excised	1	1		
Shoulder	Incised	1	1		
Do	Excised	1	1		
Lymphadenitis, inguinal, acute	Incised	8	8		
Do	Incised and drained	132	132		
Do	Incised, curetted, and drained	10	10		
Do	Excised	30	30		
Do	Excised and drained	86	86		
Do	Incised and injection of iodoform paste	1	1		
Do	Injection neosalvarsan	1	1		
Malformation of:					
Nose, congenital	Submucous resection	1	1		
Penis, congenital	Dilatation and excision	1		1	
Mastoiditis, chronic	Incised and curetted	2	2		
Mastoiditis, acute	Incised and drained	1	1		
Do	Trephining	1	1		
Do	Radical operation	2	2		
Multiple injuries	Removal foreign bodies	1			1
Do	Vessels ligated and sutured	1	1		
Do	Excision biceps and triceps muscle of arm.	1	1		
Necrosis of:					
Finger	Amputation	2	2		
Metacarpus	Removal head of bone	1	1		
Do	Removal of sequestrum	1	1		
Os calcis	Necrotic bone removed	1	1		
Phalanx	Amputation	1	1		

TABLE 5.—*Surgical operations performed during the fiscal year 1917*—Contd.

Operation for—	Character or name of operation.	Cases.	Result.		
			Successful.	Unsuccessful.	Died.
Necrosis of—Continued.					
Rib	Incised and drained	1	1		
Tibia	Incised and curetted	2	2		
Do	Incised, curetted, and drained	1	1		
Nephritis of leg	Incised	1			1
Nephrolithiasis	Removal of stones	1	1		
Osteomyelitis of:					
Femur	Amputation	1	1		
Do	Incised, curetted, and drained	1	1		
Do	Incised and dead bone removed	1	1		
Tibia	Osteotomy and curetted	1	1		
Humerus	Incised, curetted, and drained	1	1		
Jaw	Excision of bone	1	1		
Metatarsus	Incised, curetted, and drained	1	1		
Thumb	Amputation	1		1	
Otitis media	Mastoidotomy	3	3		
Paralysis musculo-spiral nerve	Excision	1	1		
Paraphimosis	Dorsal incision	2	2		
Do	Circumcision	2	2		
Paronychia	Excision of nail	1	1		
Do	Incised and drained	2	2		
Papilloma of:					
Eye	Excision	1	1		
Face	do	1	1		
Penis	Circumcision	2	2		
Rectum	Excised and curetted	1	1		
Undefined	Excision	1	1		
Periostitis of:					
Inferior maxilla	Curetted	1	1		
Tibia	Incised and curetted	1	1		
Do	Curetted and drained	1	1		
Thumb	Incised	1	1		
Metacarpus	Excision of bone	1	1		
Undefined	Incised, curetted, and drained	1	1		
Peritonitis, acute	Abdominal operation and sutured	1			1
Phimosis, acquired	Dorsal incision	33	33		
Do	Circumcision	154	154		
Phimosis, congenital	Dorsal incision	5	5		
Do	Circumcision	63	63		
Pleurisy, superative	Aspiration	8	8		
Do	Excision of rib and drained	4	3		1
Pleurisy, serofibrinous	Paracentensis of pleura	4	3	1	
Pneumonia, lobar	Resection of rib	2	2		
Prolapse of rectum	Cauterization	1	1		
Polypus, nasal	Excision	7	7		
Pterygium	do	2	2		
Redundant prepuce	Circumcision	22	22		
Rheumatism, muscular	Incision of thigh	1	1		
Rhinitis, atrophic	Excision turbinate bone	1	1		
Rhinitis, hypertrophic	Resection of nasal septum	1	1		
Rupture of:					
Bladder	Sutured and drained	1	1		
Appendix	Incised and drained	1	1		
Eyeball	Removal of eyeball	1	1		
Prostate urethra and prostate	External urethrotomy	1	1		
Do	Laparotomy	1	1		
Urethra	Retention catheter	1	1		
Do	Incised and sutured	2	2		
Sarcoma of arm	Amputation	1	1		
Septicemia of:					
Leg	Incised and drained	1	1		
Thumb	do	1	1		
Undefined	do	1	1		
Sinus of:					
Arm	Incised and drained	1	1		
Abdomen	Apendectomy and excision of sinus	1	1		
Do	Incised and curetted	1	1		
Appendicial	Excision	1	1		
Frontal	Resection of bone	1	1		
Groin	Incised	1	1		
Do	Incised and curetted	1	1		
Ischiorectal	do	1	1		
Leg	Curetted	1	1		
Turbinate	Polypoid growth removed and sinus packed.	1	1		
Stricture of urethra	Dilitation	5	5		
Do	Internal urethrotomy	5	5		
Do	External urethrotomy	3	3		

TABLE 5.—*Surgical operations performed during the fiscal year 1917*—Contd.

Operation for—	Character or name of operation.	Cases.	Result.		
			Successful.	Unsuccessful.	Died.
Sprain of:					
Ankle	Strapped and bandaged	2	2		
Back	Plaster cast applied	1	1		
Suppurative lymph glands, groin	Incised and drained	8	8		
Synovitis of knee	do	4	2	2	
Do	Resection of ligament	1	1		
Syphilitic myelitis	Amputation of thigh	1			1
Syphilis of:					
Brain	Injection of neosalvarsan	2	2		
Eye	do	1	1		
Do	Injection of salvarsan	1	1		
Eye—iritis and keratitis	Injection of neosalvarsan	1	1		
Eye—iritis	do	8	8		
Eye and annexa	Injection of neosalvarsan	2	2		
Hip joint	do	5	5		
Do	Injection of arsenobenzol	1	1		
Joint	Injection of neosalvarsan	1	1		
Larynx	Injection of arsenobenzol	1			1
Nose	Injection of salvarsan	1	1		
Do	Injection of neosalvarsan	1	1		
Penis	do	59	59		
Do	Injection of salvarsan	4	4		
Do	Injection of arsenobenzol	1	1		
Penis and phimosis	Circumcision	1	1		
Pharynx	Injection of salvarsan	1	1		
Do	Injection of neosalvarsan	2	2		
Rectum	Injection of salvarsan	2	2		
Skin	do	1	1		
Do	Injection of neosalvarsan	42	42		
Do	Injection of arsenobenzol	5	5		
Spinal nerve	Injection of neosalvarsan	2	2		
Syphilis, general	do	425	425		
Do	Injection of salvarsan	47	47		
Do	Injection of arsenobenzol	63	63		
Teratoma of back	Excision	1	1		
Tenosynovitis extensor longus	Incised	1	1		
Tonsillitis	Tonsillotomy	10	10		
Do	Excised and sutured	3	3		
Tuberculosis of:					
Bladder and stricture of urethra.	External urethrotomy	1	1		
Axilla	Excised and drained	1	1		
Cervical glands	Incised and curetted	3	3		
Epididymis	Double vasectomy	1	1		
Do	Castration	1	1		
Glands of neck	Excised and curetted	1	1		
Do	Incised and drained	1	1		
Do	Incised and packed	1	1		
Lymph glands	Incised and drained	1	1		
Do	Incised and curetted	1	1		
Skin	Scraped and cauterized	1	1		
Tendon	Incised and injection of formilin	2	1	1	
Testicle	Incised and drained	1	1		
Do	Castration	3	3		
Tibia	Incised and curetted	1	1		
Tumor of:					
Head	Excised	1	1		
Neck	Incised	1		1	
Nose, mixed, malignant	Excised	2	2		
Leg	do	1	1		
Scrotum, benign	do	1	1		
Typhlitis	Incised and excised	1	1		
Ulcer of:					
Duodenum, perforating	Exploratory laparotomy	1			1
Do	Sutured and drained	1	1		
Do	Gastro-enterostomy	1	1		
Do	Sutured	1	1		
Groin and scrotum, phagedenic	Excised	6	6		
Do	Skin graft	1	1		
Groin	Cauterized	1	1		
Leg	Excised	1	1		
Do	Excised and cauterized	1	1		
Do	Skin graft	4	4		
Skin	Incised	1	1		
Do	Skin graft	2	1	1	
Stomach	Partial removal of omentum and drained.	1			1
		1			1
Mouth	Injection of neosalvarsan	1	1		

TABLE 5.—*Surgical operations performed during the fiscal year 1917*—Contd.

Operation for—	Character or name of operation.	Cases.	Result.		
			Successful.	Unsuccessful.	Died.
Ulcer of—Continued.					
Peptic	Gastro-enterostomy	1	1		
Penis	Curetted and sutured	1	1		
Undescended testicle	Bevan's operation	2	2		
Varicocele	Paracentesis	4	4		
Do	Radical cure	5	5		
Do	Excision and ligation	45	45		
Do	Ligation	2	2		
Varix of vein	Ligation and excision	42	42		
Do	Ligation	7	7		
Venereal warts	Circumcision	1	1		
Wounds, gunshot:					
Arm	Bullet removed	1	1		
Do	Incised and drained	1	1		
Do	Skin graft	1	1		
Face	Cauterized and extraction of teeth	1	1		
Do	Incised and drained	1	1		
Foot	Bullet removed	1	1		
Hand	....do	1	1		
Thigh	....do	2	2		
Wounds, infected:					
Ankle	Incised and drained	2	2		
Foot	....do	1	1		
Finger	....do	4	4		
Do	Amputation	8	8		
Forearm	Incised and drained	2	2		
Hand	....do	2	2		
Scalp	....do	1	1		
Thumb	....do	1	1		
Toe	Amputation	2	2		
Wounds, incised:					
Arm	Sutured	1	1		
Face	....do	2	2		
Finger	....do	3	3		
Do	Amputation	2	2		
Forearm	Sutured	1		1	
Foot	....do	1	1		
Hand	....do	1	1		
Neck	....do	1	1		
Leg	....do	1	1		
Scalp	....do	2	2		
Wounds, lacerated:					
Arm	....do	2	2		
Cervix uteri	Trachelorrhaphy	1	1		
Ear	Sutured	1	1		
Finger	Incised and drained	2	2		
Do	Sutured	2	2		
Do	Amputation	1	1		
Forearm	Sutured	1	1		
Face	....do	2	2		
Hand	Incised and drained	3	3		
Do	Amputation of fingers	5	5		
Leg	Incised and drained	2	2		
Lip	Sutured	2	2		
Shoulder	....do	1	1		
Scalp	Sutured and drained	1	1		
Scrotum	Plastic operation	1	1		
Thigh	Sutured	2	2		
Testicle	Castration	1	1		
Thumb	Sutured	1	1		
Toe	Amputation	1	1		
Wounds, punctured:					
Finger	Incised and drained	2	2		
Foot	Incised and packed	1	1		
Hand	Incised and drained	1	1		
Leg	....do	1	1		
Wounds, stab:					
Abdomen	Abdominal section	1	1		
Wounds, unclassified:					
Arm	Incised	1		1	
Finger	Suture of tendon	1	1		
Hand	....do	1	1		
Wrist	....do	1		1	
Warts	Cauterized	1	1		
Do	Excised and sutured	1	1		
Total		3,121	3,068	20	33

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